

AN AYURVEDIC REVIEW ON CLINICAL UTILITY OF GHRITA

Prof. Dr. Shubhangi Katkar^{1*} and Dr. Sanjay Anant Dhurve²

¹B.A.M.S., M.D., Ph.D., Medical Director Bharati Ayurved Hospital & Professor in Department of Panchkarma, College of Ayurved Bharati Vidyapeeth (Deemed to Be) University, Pune, Maharashtra, India

²B.A.M.S., M.D., Ph.D., Associate Professor, Department of Kayachikitsa, College of Ayurved Bharati Vidyapeeth (Deemed to Be) University, Pune, Maharashtra, India

*Corresponding Author

Abstract:

Ghruta is natural and unique product which is most beneficial to all. It combats with many diseases and keeps healthy. Among the four types of Sneha (fats), ghruta is the best one due to its ability to assimilate effectively the properties of the ingredients added to it and without losing its own properties. It improves digestive power and other qualities are related to milk. Ghruta kalpana plays a very important role in the treatment of various diseases. So Ghruta consumption should be done daily. Ghrutam, also known as ghee, is the best choice for internal oleation due to its qualities of oiliness which nourishes and moistens our bodies.

Keywords: *Ayurveda, Ghruta, Goghruta, Rasayan, Agnivardhaka, Balya, Buddhivardhaka, Vayahasthapana, Cow's ghee*

1. Introduction:-

Clarified milk fat or butter is known as Ghee. It is prepared by heating butter or cream to just over 100°C to remove water content by evaporation. The residue is filtered out as pure Ghee. Ghee contains approximately 8% lower saturated fatty acids which makes it easily digestible. These lower saturated fatty acids are the most edible fat and which are not found in any other edible oil or fat. Ghee also contains vitamins A, D, E & K. Vit. A & E are anti-oxidant. No other edible fat or oil contain vitamin A except fish oil. Ghee also contains 4.5% linolic acid an essential fatty acid which promotes proper growth of human body. During preparation of ghee, protein casein is removed. Ghee resist spoilage by micro-organisms or chemical action. The melting point of Ghee is 35°C, which is less than the normal human body temperature. Its digestibility coefficient or rate of absorption is 96% which is highest of all oils and fats.

Majority of Ayurvedic preparations are made with ghee. Digestion, Absorption and delivery to a target organ system is important in obtaining the maximum benefit from any formulation. This is facilitated by Ghee. Since active ingredients are mixed with ghee. They are easily digested and absorbed. Lipophilic action of ghee facilitates transportation to a target organ and final delivery inside the cell, because cell membrane also contain lipid. The lipophilic nature of ghee facilitates entry of formulation into the cell and its delivery to the mitochondria, microsome and nuclear membrane. Ghee contains beta carotene and vit E and both are known anti-oxidants. The effectiveness of many Ayurvedic compounds is due to potent antioxidant properties of removing or scavenging free radicals. ghee in general is one of the easily digestible and assimilable food which provides nutrients and critical antioxidants to the human body for its protection and growth. In Ayurveda there are eight kinds of Ghrita / Ghee which are obtained from milk of eight different animals. Among all, Goghrita (Cow 's ghee) is considered best.¹ Ghee has its own importance in Ayurveda for thousand years. Cow Ghee is best for balancing Vata (air) and Pitta (fire) related doshas .² It is an excellent base for preparing Ayurvedic medicines, due to the fact ghee has somewhat different ability to arrive each and every body parts with in short period, which help to transport medicine without any change called as —yogawahil action in Ayurveda.³ In Ayurveda, ghee is enlisted under most sattvic foods and which help to promote positivity, growth and consciousness. Cow ghee is applicable in all internal body mechanisms and considered in Ayurveda as ‘amrita’(nectar). It had various health benefits such as slows the aging process, amplify the body immune system, facilitates the bowel movement, improve the health of the teeth & gums, treat the chronic cough issues and also eyes disorders. Goghrita is the one of the best choices for food and medicinal purposes both. In Ayurvedic classics and scriptures, if not specified, the word Ghrita always applies to Goghrita.⁴

2. Aims and Objectives of Study

1. To Study literature view on Go-ghrita
2. To recognize the importance of Go-ghrita in various disorders

3. Review of Literature

a. Etymology: - Goghrita refers to the - ghee of Indian cow - Bos Primigenius Indicus” and is used in Ayurveda as Ghrita kalpana. Ghrita kalpana are mentioned to have shelf life of 16 months as per Ayurvedic classics and is shelf-life notification of Government of India.⁵

b. Goghrita:- The word Go ghrita is evolved from Sanskrit word ghrita. Go ghrita is a common Indian name for clarified butter fat. The origin of Go ghrita making probably lies far beyond recorded history. The word itself stems from the old Sanskrit _ghr‘ which means bright

or to make bright. When sprinkled on fire, butterfat enhanced its brightness merged with cause. Butterfat was later christened ghrta, which evolved into Go Ghrta. ⁶

c. Pharmacodynamics ⁷:

- **Gana:** Madhura Skandha
- **Source:** Jangama Sneha
- **Rasa:** Madhura
- **Guna:** Snigdha, Guru
- **Veerya:** Sheeta
- **Vipaka:** Madhura
- **Karma:** Medhya, Agnivardhak
- **Action:** Rasayana, Vajikarana, Rasavardhaka, Swarya, Varnya, Beneficial for Bala, Vriddha, Abala, Kshata and Ksheena; increases Oja, Medha, Smruti, Agni, and Indriyabala

d. Chemical composition⁸: The carotene content is responsible for the colour of Ghrta from yellow to white. Goghrta provides energy to the body as 1 gm of Ghrta gives 9.3 calories.

Triglyceride	97.98%,
Diglyceride	0.25-1.5%,
Monoglyceride	0.16- 0.038%,
Ketoacid glyceride	0.015- 0.018%,
Glycerylestors	0.011-0.015 %,
Free Fatty acid	0.1-0.44 %
Phospholipids	0.2-1.0 %,
Sterols	0.22-0.4 %
Vitamin A	2500/100 gm
Vitamin D	8.5×10.7 gm / 100 gm
Vitamin E	24 x 10.3 gm / 100 gm
Vitamin K	1×10.4 gm / 100 gm
Butyric acid	4.5-6.0%,
Caporic acid	1.0-1.36%
Caprylic acid	.9-1%,
Capric acid	1.5-1.8%,
Lauric acid	6-7%
Myristic acid	21-23%,
Palmitic acid	19-19.5%,
Stearic acid	11-11.5%,
Archidic acid	0.5-0.8%,
Oleic acid	27-27.5%

Goghrita is easily digestible because of approximately 8% lower saturated fatty acids. This amount of lower saturated fatty acid is only found in Goghrita and not found in any other edible oil or fat. Goghrita also contains vit. A, D, E and K. Vit. A and K are antioxidants which are helpful in preventing oxidative injury to the body. No other edible fat or oil contains Vit. A except fish oil. Vit. A keeps epithelial tissue of the body intact, keeps the outer lining of the eyeball moist and prevents blindness. Ghrita also contains 4-5% linoleic acid an essential fatty acid which promotes proper growth of human body. During preparation of ghee, protein casein is removed. Animal studies have shown that casein elevates cholesterol. Goghrita resists spoilage by microorganisms or chemical action.

Beta carotene and Vitamin E are known as antioxidants presents in Goghrita. It is estimated that 80% to 90% of degenerative diseases are related to excessive production of free radicals of reactive oxygen species. When free radicals are in excess, they try to catch on to whatever is available in their surrounding area and this is how the lipids in the blood and cell membrane are oxidized. The oxidized lipids or the lipid peroxides are injurious to the system. The reactive oxygen species (ROS) cause damage to the DNA in the cells. The effectiveness of compounds is due to potent anti-oxidant properties of removing or scavenging free radicals.

e. Ghrita- Properties and Indications

Goghrita act as Rasayan, Vrishya, Agnivardhaka, Rasavardhaka, Balya, Ojovardhaka, Kantivardhaka, Indriyabalavridhikar, Buddhivardhaka, Vayahasthapana, Unmadahara etc. It pacifies Vata by snigddha guna, pitta by madhura rasa and shaityata and kapha by processing with kaphahara drugs. It should be taken in small quantities for longer duration to pacify pitta and in large amounts to pacify Vata.⁹

In Bhavaprakasa it is told that Goghrita is Rasayana, tasty, good for eyes, stimulant for digestion, supports glow and beauty, enhances memory and stamina, promotes longevity and protects the body from diseases. Other properties of ghrita include cooling and mruduta of angas, enhancing clarity of voice and complexion. It is conducive for rasa dhatu, sukra dhatu and ojus [C.Su 13/14].

Ghrita is indicated in persons suffering from conditions like ruksata, ksata, Vata vikara, Pitta vikara, Unmada, Mada, Apasmara, Murcha, Siroroga, Aksiroga, Vrana, Sosa, Jwara, Daha, smrti, Angimandya, and persons who are vridhha, bala, and those who are desirous of Ayu, bala, varna, swara, pusti, praja, saukumarya, bala, buddhi and indriya and clearness of voice.

The most important property that makes it distinct from taila, vasa or majja is its action on higher mental functions. i.e., dhi, medha, smrti etc. In mastiskajanya vikras, snehana especially

by ghrita is very much important, due to the similarity of mastulunga sneha dravyas. So, it has targeted action on intellectual and cognitive functions.

Moreover, Acharya Charaka has mentioned that the properties of ghee of animals are similar to their milk. Milk of cow is sweet in taste and has sheeta, mrdu, snigdha, picchila, guru, manda and pleasing properties. All these ten properties of milk are similar to that of ojas. Therefore it increases ojas and is Jivaniya i.e., it provides all the benefits of Rasayana.¹⁰

Ghrita being Yogavahi can be used in other Ayurvedic preparations. Digestion, absorption and delivery to a target organ system is crucial in obtaining the maximum benefit from any formulation. This is facilitated by Ghrita. Since active ingredients are mixed with Ghrita, they are easily digested and absorbed – Lipophilic action of Ghrita facilitates transportation to a target organ and final delivery inside the cell, because cell membranes also contain lipid. The modern lipophilic nature can be compared with the Yogavahi Guna of Ghrita according to Ayurveda. This lipophilic nature of Ghrita facilitates entry of the formulation into the cell and its delivery to the mitochondrion, microsome and nuclear membrane.

f. Benefits of Go-Ghrit /Cow's ghee¹¹

- 1) It is good for the brain, eyes and skin.
- 2) It is full of essential nutrients and fatty acids.
- 3) It is antibacterial, antiviral, anti-fungal.
- 4) It is anti-aging and anti-oxidant.
- 5) It has cooling effect on the body.
- 6) It detoxifies the body and is good for the skin.
- 7) It increases energy, weight and strength.
- 8) It is easily digested by body compared to other ghee.
- 9) It can stimulate secretion of stomach acids, and thus helping in the digestive process.
- 10) Since it increases the secretion of biliary lipids, it can help in reducing cholesterol level in intestine and serum.
- 11) It increases the absorbability of vitamins and minerals thus help to improve overall health.
- 12) It balances all agnis (digestive fires).

Go Ghrita has power to cross Blood Brain Barrier so helpful in treating many mental disorders. It promotes longevity and reproductive fluid and is good for children and the elderly. In therapeutic doses Goghrita increases appetite, and gives relief from abdominal discomfort and constipation. It also reduces the burning sensation and redness of eyes significantly.

7. Scientific Facts About Goghrita Cholesterol does not increase by intake of Cow ghee. It has not bad for the heart. Recent studies have shown that Omega 6 and Omega 3 fatty acids are present in ideal ratio in Goghrita so it is healthier than other cooking fats.

According to Russian Scientist Serveys, Cow 's ghee has immense power to protect human body from the ill effect of radioactive waves.

Recently some studies have shown that Goghrita contains various anticarcinogen, such as conjugated linoleic acid (CLA), butyric acid, sphingomyelinn, lipid, vitamins. CLA content is generally 0.6 % in cow ghee. CLA inhibits growth of melanoma, mesothelioma and glioblastoma showing its anti-carcinogenic activity. The value of sphingomyeline content in Cow ghee is 9.31mg/100g. The anticarcinogenic effect of ghee is mainly due to its biologically active metabolites sphingosine and ceramide. This may contribute to the suppression of oncogenesis.

Ghrita also improves digestibility of other component, mineral absorption from diet. Cow 's ghee increases the retention of calcium up to 45% and phosphorus up to 57%. Because of Phospholipids, Fatty acids etc. in Goghrita, it is helpful in correcting the altered disturbed neurotransmitter. Ghrita fortified with medhya drugs releases the medhya effect of the drugs at neurotransmitter working place (synaps etc.)¹²

Presence of Cow's ghee makes medicines more potent and helps in better absorbability. Medicines along with Goghrita reach to the minutest pores of the body and lubricate them. Medicated ghee increases the tonicity of nerves and brain. As per Ayurveda, Purna Ghrita (ghee which is stored for 5-10 years before use) is useful in the treatment of epilepsy, intoxication, fainting, malaria, diseases of the head, eyes, ear, and diseases of female reproductive system. It is antibacterial, and antimicrobial in nature. It shows beneficial effects in pneumonia, cough, and excessive phlegm. Purana Ghrita is a tonic and expectorant. Topically it is used on boils, carbuncles and sores.

g. Role of Goghrita in certain disorders¹³

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.

Various Prepared Ghritams and Their Uses: -

Name of Ghritams	Uses
Indukata Ghritam	The main herb Dashamula balances both pitta and vata dosha, supports healthy digestion, lowers acidity, boosts digestive fire and immunity.
Kalyanaka Ghritam	Kalyanka balances mainly vata and pitta dosha, supports the nervous system, energy, nourishes muscles, bones, and nerves and improves mood and feeling of well-being.
Guggulutiktaka Ghritam	The main herb guggulu balances all three doshas, removes ama from blood, liver and skin, and supports healthy skin.
Jatyadi Ghritam	The main herb is jasmine leaf which balances pitta dosha, and supports the healing of wounds and cuts.
Triphala Ghritam	The main herb is triphala which balances both kapha and pitta dosha, supports healthy eyes by removing excess heat and nourishing the muscles and eyesight.
Nirgundyadi Ghritam	The main herb is nirgundi which balances both kapha and vata dosha, supports respiratory health by calming nasal congestion.
Phalasarpis Ghritam	The herbs in this formula are in equal quantity and help balance vata dosha, supports both male and female reproductive organs and fertility.
Brahmi Ghritam	The main herb Brahmi balances vata dosha, supports brain and nerve health, improves focus and concentration, and sound sleep.
Mahakalyanaka Ghritam	This is more potent than Kalyanaka ghritam and balances both vata and pitta dosha, supports the nervous system, energy, and nourishes muscles, bones, and nerves.

Mahatiktakam Ghritam	This formula is a combination of bitter herbs that help balance pitta dosha, remove ama and acid from the blood, liver, gut and skin, and supports healthy skin and complexion.
Varanadi Ghritam	The main herb varuna balances both kapha and vata dosha, supports healthy kidneys and urinary system, removes excess kapha, and supports digestion.
Vidaryadi Ghritam	The main herb is Vidari kanda which balances vata dosha, supports respiratory health, nourishes all body tissues, and supports healthy weight gain.
Saraswata Ghritam	The main herb Brahmi balances vata dosha, supports healthy brain and nerve function, concentration and energy.
Sukumara Ghritam	The main herbs are Dashamula and Purnarnava which balances vata dosha, supports and nourishes the female reproductive system and hormones.
Sukhaprasavada Ghritam	The main herb upodika balances vata dosha, helps muscle relaxation during birth and supports the pelvic girdle and organs.
Suranadi Ghritam	The main herb Surana balances vata dosha, removes ama from the stomach and gut and supports digestive fire and agni.
Mahatriphala Ghritam	This formula is more potent than Triphala ghritam, The main herb is triphala which balances both kapha and pitta dosha, supports healthy eyes by removing excess heat and nourishing the muscles and eyesight.
Shatavaryadi Ghritam	The main herb Shatavari balances both vata and pitta dosha, supports the urinary system and nourishes kidney health.
Dadimadi Ghritam	The main herb is dadima (pomegranate) which balances vata dosha, helps improve appetite, indigestion, and promotes colon health.

h. Balya Karma of Goghrita

Acharya Sushruta mentioned Goghrita as Agnidipaka i.e. increases appetite. Due to its Agnidipaka property capacity of food intake increases as well as digestion improves. Ahara taken is converted in to Uttam Aharaarasa and further Aharaarasa converted in to Rasa, Rasa in to Rakta Dhatu and gradually remaining Dhatus are formed. Goghrita is Madhur Rasatmaka Dravya. Its Veerya is Sheeta. Ghrita pacifies Pitta and Vata, increases Kapha, Rasa, Shukra and Oja. It enhances nourishment of Rasa Raktadi Dhatus and Ojas i.e Bala.¹⁴

4. DISCUSSION

Recent studies about Goghrita

Anticancer activity: A study was conducted on feeding Cow's ghee versus Soyabean oil on 7,12-dimethylbenz(a)-anthracene (DMBA) induced mammary carcinogenesis and expression of cox-2 and peroxisome proliferators activated receptors- γ (PPAR- γ) in mammary glands of rats revealed anticancer potential of Cow's ghee. The study proved that Soybean oil attenuates mammary carcinogenesis induced by DMBA whereas Cow 's ghee opposed it.¹⁵

The metabolism of chemical carcinogen involves two steps; in the first step carcinogen is metabolized to a reactive molecule by phase-I enzymes and in the second step, active metabolite gets detoxified by several phase-II enzymes. Thus the study on relative activity of phase I and phase II enzymes would determine the extent of tumorigenesis. The phase I cytochrome P450 enzymes are membrane bound and their activities are influenced by the lipid environment. Therefore, altering membrane lipid composition by feeding animals on singular source of fat might affect carcinogen metabolism.¹⁶ Further study carried out to know the exact mechanism behind the anticancer potential of cow ghee versus soyabean oil by observing the effects on carcinogen metabolizing enzymes in the rats. The study proved that cow ghee compared to soybean oil downregulates the enzyme activities responsible for carcinogen activation in liver and upregulates carcinogen detoxification activities in liver and mammary tissues.¹⁷

Nootropic activity:

Nootropic activity of Panchgavya Ghrita (PGG) was studied using Diazepam induced amnesia in mice and Morris Water Maze (MWM) test in rat model. Piracetam was used as standard drug. Panchgavya ghrita successfully reversed the amnesia induced by Diazepam (1mg/kg, i.p.). The test showed significant effect of 5gm/kg dose of Panchgavya ghrita. Also, Piracetam and Panchgavya ghrita at 3.5gm/kg have significant memory enhancement action in MWM test in rats suggesting possible use of PGG as adjuvant in mental disorder treatments.¹⁸

Various Medhya Ghrita with Rasayana and Medhya drugs which are madhur, Snigdha, Vramhana, Vatahara and Ojovardhak are helpful in brain ageing as it enhances the brain function.¹⁹

Wound Healing and Antiulcer activity: A case study was done for a wound in a buffalo which did not respond to many treatments from herbal to modern responded very well to the treatment by a formulation containing Cow 's ghee. Cow 's Ghrita contains several saturated and unsaturated fatty acids which are capable of taking part in metabolic processes involved in any wound healing so it is used as wound healing properties.²⁰

A study of wound healing activity of Goghrita preparation containing Aegle marmelos leaves and Cow 's ghee showed enhanced and rapid healing. The effects produced by topical application of combination of Aegle marmelos leaves extract and cow ghee with reference to wound contraction, wound closure, decrease in surface area of wound and tissue regeneration at the wound site were studied. The wound healing activity was found to significant as the wound was healed completely in eight days.²¹

Eye Lubricant activity: Computer Vision Syndrome (CVS) characterized by burning sensation, dryness, redness and itching in the eyes are related to Netradaha, Netrarukshtava, Netralalima, Netrakandu in Ayurveda. Goghrita (Cow ghee) is Snehotam. It posses properties of Snigdha, Guru and Mrudu and lubricating property because of these properties Goghrita is very useful for vitiated pitta and vatta dosha in CVS and reducing the dryness, redness and itching in the eyes.²²

Cow ghee and Diabetes

Kumar Ravi reviewed the function of Cow's Ghee in prevention and treatment of Diabetes as a Dietary complement. In this study it was concluded that the Cow's ghee components are inversely associated with Diabetes and in limited quantity it is effective in preventing and treating the diabetes and its associated complications. Cow ghee having Carotenoids, Vitamin A, D, E (antioxidants), Mg and Ca. and all these substances have shown antidiabetic activity.²³ Animal studies have verified many helpful result of ghee, inclusive of dose-dependent decreases in serum total cholesterol, low density lipoprotein, very low density lipoprotein, and triglycerides; decreased liver total cholesterol, triglycerides, and cholesterol esters; and a lower level of non-enzymatic induced lipid per oxidation in liver homogenate.²⁴ Odd chain fatty acids like Pentadecanoic acids and Heptadecanoic acid have positive effect on cardiovascular system and associated with reduced risk of Diabetes.²⁵⁻²⁶

Cow ghee is a very good source of Conjugated Linoleic Acid (CLA) and it has proven antidiabetic effect in animal research due to complex regulation of the genes vital in reducing adiposity, improved insulin action and signal transduction in skeletal muscles. Cow ghee contains Linoleic acid which decreases inflammatory mediators such as leucotrienes, prostaglandins and interleukins. The potential of ghee to lower the levels of Arachidonic acid metabolites decrease secretion of leukotriene is also recommended in preventing the complications of Diabetes such as CVD, Atherosclerosis etc.²⁷

Cow Ghee helps in digestion²⁸

Kumar et.al. studied that Goghrita contains butyric acid which is having short chain fatty acid gives distinct flavor and help in digestion. Beneficial microorganisms in intestine which converts fibers into butyric acid are used for source of energy and intestinal wall support. Studies have confirmed that people with unhealthy digestive tracts do not produce butyric acid. Researchers suggest that the production of killer T cells in the gut get adequate support from production of butyric acid and as a result strong immune system.

Ghritha kalpana in the management of dementia²⁹ Ghritha is one among the best Ajasrika Rasayanas. It is Ayu Vardhaka, Vayasthapaka, Balavardhaka, Ojovardhaka, Dhatuposhaka and

is supreme among Snehana Dravyas. By virtue of Yogavahitva, as per its ingredients the medicated Ghrita add on the properties of the ingredients. It is brain tonic used in Unmada, Shosha, Kustha, etc.

Ghrita has one property Samskarasyanuvartanum i.e. there is no other such material which imbibes the quality to the extent that Ghrita does. It is Rasayana, Bramhana and ParamYogavahi. Most Ayurvedic formulations are made with Ghrita. Digestion, absorption and delivery to a target organ system are crucial in obtaining the maximum benefits from any formulation. This is facilitated by Ghrita. In Mastishkajanya vikaras Snehana especially by Ghrita is very much important; due to the similarity of Mastulunga Sneha Dravyas.

5. CONCLUSION

It may be concluded that Goghrita is natural and unique product which is most beneficial to all. It is helpful in many diseases and keeps healthy. Goghrita is one of the best sneha among four and best among all the eight types of Ghrita described in Ayurveda from different animals. Cow Ghee, the butter fat obtained from the cow milk has been claimed to have many medicinal properties like it is cooling in energy, enhances memory and stamina, increases the intellect and promotes longevity. It is an aphrodisiac and protects the body from various diseases. Hence, we can use Go ghrita in our routine daily life, as gives good result and delays the ageing procedure by keeping us healthy and fit forever. Use of Go ghrita is best described in Ayurveda. Ayurved have described its use in the treatment part as well as in diet and as immunomodulator.

REFERENCES

- [1] Vagbhatta, In Astanga Hridaya, Sutrsthana, 5/39, Reprinted ed. Harishashtri Paradkar Vaidya, editor, New Delhi, Rashtriya Sanskrita Samstha 2002, pp73-74
- [2] Mahakalkar A et.al. The Verstality of Cow Ghee- An Ayurvedic Perspective, Am J Drug Deliv, 2014; 1(1):28-34.
- [3] Kodite Waku SD, Review on Ghee and Ayurvedic Uses, In; International Confrences on Ayurveda Traditional Medicine and Medicinal Plant; p.1-7
- [4] Mahakalkar A et.al. The Verstality of Cow Ghee- An Ayurvedic Perspective, Am J Drug Deliv, 2014; 1(1):28-34.
- [5] www.wisdomlib.org/definition/goghrita
- [6] Sud Sushant, Kateria Girish, Significance of Goghrita in Lifestyle and Psychological disorders, IJAPC, 2015, Vol.3, Issue 5, 177-187.

- [7] Singh M et al., Goghrita Cow's Ghee- An Ayurvedic Approach, WJPPS(2019), Vol.8, Issue 9, 1416-1421.
- [8] Dhurvey Y.R. et.al. , Evaluation of Physiochemical properties of Goghrita before and after Hydrogenation, IJCTR, 2012, 4(1).
- [9] Dr Swati Khandale et al., Efficacy of Goghrita in the management of Karshya- An Open labelled Controlled Clinical Trial, IJAR2019, 7(7), 97-107.
- [10] Singh M et al., Goghrita- Cow 's Ghee- An Ayurvedic Approach, WPPPS, 2019, Vol.8, Issue 9, 1416-1421.
- [11] Anupama, Indian Cow 's Ghee- Benefits and Medicinal use in Ayurveda, Bimbima, July 2015.
- [12] Singh M et al., Goghrita- Cow 's Ghee- An Ayurvedic Approach, WPPPS, 2019, Vol.8, Issue 9, 1416-1421.
- [13] Anupama, Indian Cow 's Ghee- Benefits and Medicinal use in Ayurveda, Bimbima, July 2015.
- [14] Dr Swati Khandale et al., Efficacy of Goghrita in the management of Karshya- An Open labelled Controlled Clinical Trial, IJAR2019, 7(7), 97-107.
- [15] Rani Rita & Kansal Vinod: Study on Cow Ghee Versus Soybean Oil on 7, 12 DMBA induced memory carcinogenesis and expression of cyclooxygenase and peroxisome proliferators activated receptor Gamma in rats, IJMR, May 2011; 133: 497-503.
- [16] Talaska G et al., Dietary Fat composition and intake affects DMBA metabolism and DNA adduct formation in breast organ, 3rd Annual BCERC, early environmental exposure Conferences, Berkely, CA, November 2-3, 2006
- [17] Rani Rita & Kansal Vinod: Effects of Cow Ghee & Soybean Oil on carcinogen metabolizing enzyme in rats, IJMR, September 2012; 136: 460-465.
- [18] Pandey A and Pawar MS: Assessment of Nootropic Activity of panchgavya Ghrita in Animal Models; IJSRP, Aug 2015; 5(8): 1-5.
- [19] A.V.Joshi et al. Brain ageing and Rasayana treatment, Asian Journal of Multidisciplinary Studies, November 2014; Volume 2, Issue 11: 27-30
- [20] Biyani DM et al., A case report on Wound Healing activity of Cow Ghee, IJAM, 2011; 2(3): 115-118.

- [21] Gupta Ankita et al. Wound Healing Activity of Topical Application of A marmelos and Cow Ghee, IJDDHR, AprailSeptember 2014; 4(283): 741-745
- [22] Maulik S S et al., Conceptual study of Goghrita Eye drops (Aschyotana) in Computer Vision Stndrome, Asian Journal of Multidiciplanary studies, Oct 2013; 1(3): 1-6.
- [23] Ravi K, Critical review of Cow Ghee intake and its relation with Prameha on Diabetes, WJP:2018; 7, 459-466.
- [24] Dwivedi C et al., Effects of Diatery Ghee on Serum lipids in rats, JAM, 2002; 5:65-68
- [25] Smedman AE et al., Pentadeconic acid in serum as a marker for intake of milk fat and metabolic risk factor, Am J Clin Nutr., 1999; 69(1): 22-29.
- [26] Brevik et al., Evaluation of the odd fatty acid 15:0 and 17:0 in serum and adipose tissue as markers of intake of milk and dairy fat., Eur J Clin Nutr, 2005; 59(12): 1417-1422.
- [27] Dwivedi et al., The effect of Ghee on Serum Lipid Level and Microsomal lipid peroxidation., 31:134-140.
- [28] Sindhuja S et al., Health benefits of Ghee (Clarified butter)- A review from Ayurvedic perspective, IPJ Nutr Met Health Sci., 2020; 3(3); 64-72.
- [29] Achaarya JT, Charaka Samhita with Ayurveda Dipika [Commentry of Chakrapanidatta