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Goghrita : The Nectar In Modern Era And Its Effects On Brain Functions

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❖ **Abstract:**

Ghrita (ghee), especially Goghrita made from cow's milk, is regarded by Ayurveda as a multipurpose dietary and medicinal ingredient with restorative properties. Goghrita is well known for its capacity to maintain equilibrium between the Pitta and Vata doshas as well as for being lipophilic, which enables it to cross the blood-brain barrier for more focused distribution and bioavailability. The Rasayana characteristic of Goghrita implies that regular use may help lower the likelihood of mental disease recurrence. Ghrita improves the medicinal qualities of pharmaceuticals when it is processed, which could make formulations using Goghrita more beneficial and effective for treating a range of illnesses. This Goghrita has some peculiar features, which is important for performing its action on brain. This study is an attempt to study Goghrita and its functions on brain function.

Keywords: Goghrita, Rasayana, brain, functions.

❖ Introduction:

Among the oldest medical systems in the world is Ayurveda. It is a life, health, and healing science founded on the unchanging principles of nature. This special ancient Indian wisdom has endured vividly through the ages and is currently flourishing in modern dimensions that are drawing attention from all across the world. The mind or manas is considered three dimensional: Sattva, Rajas, Tama.The entire concept of manas or mind is psychological in nature. Itsneurophysiological attributes have not been described vividly in Ayurveda. However, Bhela Samhita states that the mana is located in the skull (Sirastalvantargatam Manah). According to Ayurveda mental health is a state ofsensorial, mental and spiritual well being. The mental ill health is brought aboutessentially as a result of unwholesome interaction between the individual and hisenvironment.
A wide range of psychiatric conditions have been described in Ayurveda. Primary psychological conditions caused purely by Manasa Doshas, i.e. Rajas and Tamas include : Lust (Kama), Anger (Kodha), Greed (Lobha), Delusion (Moha), Jealousy (Irsya), Pride (Mana), Euphoria (Mada), Grief (Soka), Anxiety (Chinta), Neurosis (Udvega), Fear (Bhaya), Happiness (Harsha). Moreover, other psychiatric conditions are also described in the classical literature caused by mixed Samprapti including both the Sharirika and Manas Doshas. Acharya Vagbhata stated that Goghrita has important functions on brain like Dhee, Smruti, medha etc.[1] Present study has glimpse of action of Goghrita on Brain.

❖ Aim –

To study Goghrita and its functions on brain functions.

❖ Objective:

1. To take various references related to *Ghrita*in classical Ayurvedic texts.
2. To study its functions on brain functions.

❖ Material and Methods –

Main Classical *Ayurvedic* texts are used. e.g. *Charak Samhita, Sushrut Samhita, Ashtang Hrudya*. Many Ayurvedic Manuscripts are also used for this study. Various online databases, Articles, research materials are also used for this study as a source material.

❖ Review of Literature:

- **Goghrita:**

- Gana - Madhura Skandha (Cha)
- Sanskrit Name - Sarpi

- English Name - Ghee
- Guna - Snigdha, Guru
- Virya - Shita
- Vipaka - Madhura
- Doshkarma - Tridoshashamaka
- Source - Animal fat : Jangama Sneha

- **Action:**[2]
- Rasayana, Vajikarana, Rasavardhaka, Svarya, Varnya,
- Beneficial for Bala, Vridhdha, Abala (Stri), Kshata and Kshina,
- increases Oja,Medha, Smruti, Agni and Indriyabala.

- **Historical Review:**

Ghee known as Ghritam, havish, sarpish and ajya, was produced in ancient. India as early as 1500 B.C. the Rigveda is the oldest collection of Hindu hymns, contains numerous references on ghee, showing its importance in Indian diet.The health benefits from ghee can be fundamentally categorized as, those thatare obtained from consuming ghee as food and those are obtained by using gheeas an Clarified milk fat or butter fat is known as ghrita. It is prepared by heating butter or cream to just over 100^{o}C to remove water content by some common features. There are differences in their properties and Goghrita is the best andthe choice for food and medicinal purposes. So in Ayurvedic classics andtradition, if not specified, the word ghrita always applies to Goghrita.
Ghrita is one among the best Ajasrika Rasayanas. It is Ayu Vardhak, Balavardhak, Ojovardhak, Vayasthapak, Dhatuposhak and is supreme in Snehana Dravyas. By virtue of Yogavahitva, as per its ingredients the medicated Ghrita will be attaining properties. According to Bhav Prakash Nighantu, cowghee is helpful for eye sight, improving digestion. 'TridoshNashak',energetic, brain tonic, ageing factors, Tonic, fragrant, Cold and over all the best of the ghee. Goghrita is called as Uttamam which means that which is best in all Ghritas. It is also used in Unmada, Sosa, Kustha, etc.[3]Ghrita has one property Samskaranuvartanum i.e. there is no other suchmaterial which imbibes the quality to the extent that Ghrita does. It is Yogavahi,Rasayana and Brmhana. So it carries active principles of the drugs to increasesthe potency of the compound drug.
Most Ayurvedic formulations are made with ghrita. Digestion, absorptionand delivery to a target organ system is crucial in obtaining the maximumbenefits from any formulation. This is facilitated by Ghrita. Lipophilic action of Ghrita facilitates transportation to a target organ and final delivery inside thecell, because cell membrane also contains lipid.This lipophilic nature of Ghrita facilitation entry of the formulation into the cell and its delivery to themitochondrion, microsome and nuclear membrane. When herbs are mixed with Ghrita, their activity and utility is potentate many times.

- **Pharmacodynamics**:
- Rasa : Madhura
- Guna : Snigdha, Guru
- Veerya : Sheeta
- Vipaka : Madhura
- Karma : Medhya, Agnivardhak

- **Karma of Goghrita according to various text**

Karma	C.S.	S.S.	A.H.
Agnivardhaka	+	-	-
Rasavardhak	+	-	-
Balya	+	+	+
Ojavardhaka	+	-	-
Kantivardhak	+	-	+
Indriyabalavridhi	+	-	-
Budhivardhak	+	+	+

Vayah sthapana	+	+	+
Unmadahar	+	+	+
Apasmarahar	-	+	-

- **Goghrita - Properties and Indications**

It pacifies vata by snigddha, pitta by madhura rasa and Saitya and kapha by processing with kaphahara drugs. It should be taken in small quantities forlonger duration to pacify pitta and in large amounts to pacify vata. In Bhavaprakasa it is told that ghrita is Rasayana, tasty, good for eyes, stimulant for digestion, supports glow and beauty, enhances memory andstamina, promotes longevity and protects the body from diseases. Other properties of ghrita include cooling and softening effect on the body, enhancing clarity of voice and complexion. It is conducive for rasa dhatu, sukra dhatu and ojas.[4]

Ghrita is indicated in persons suffering from conditions like ruksata, kshata, Vata vikara, Pitta vikara, Unmada, Mada, Apasmara, Murcha, Siroroga, Aksiroga, Vrana, Sosa, Jwara, Daha, smriti, Angimandya, and persons who are vriddha, 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 ormajja is its action on higher mental functions. I.e., dhi, medha, smriti etc. in mastiskajanyavikras snehana especially by ghrita is very much important, due to the similarity of mastulungasneha dravyas**.**[5] So it has targeted action onintellectual 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 cold, soft, thick, smooth, slimy, heavy, slow and pleasing properties. All these tenproperties of milk are similar to that of ojas. Therefore it increase ojas and is Jivaniya i.e.it provides all the benefits of Rasayana.

- **Chemistry**:

The colour of ghee is yellow to white depending on carotenecontent.

- **Chemical composition of Cow Ghee**

Triglycerides	97.98%
Phospholipids	0.2-1.0%
Diglycerides	0.25-1.5%
Steroles	0.22-0.4%
Monoglycerides	0.16-0.038%
Vitamin-A	2500 / 100gms
Ketoacid glyceride	0.015-0.018%
Vitamin-D	8.5x10.7 gm / 100 gm
Glycerylestors	0.011-0.015%
Vitamin-E	24 x 10.3 gm / 100 gm
Free fatty acid	0.1-0.44%
Vitamin-K	1x10.4 gm / 100 gm

- **Fatty Acids Percentage (%)**

Butyric acid	4.5-6.0
Caproic acid	1.0-1.36
Caprylic acid	0.9-1.0
Capric acid	1.5-1.8
Lauric acid	6.0-7.0
Myristic acid	21.0-23.0
Palmitic acid	19.0-19.5
Stearic acid	11.0-11.5

Arachidic acid	0.5-0.8
Oleic acid	27.0-27.5
Linoleic acid	4.0-5.0

Ghee contains beta-carotene and Vitamin E and both are known antioxidants. It is estimated that 80% to 90% of degenerative disease related toexcessive production of free radicals of re – active Ghee resists spoliation bymicroorganisms or chemicals. Some animal studies have shown theprotein casein present in butter elevates cholesterol, but it is removed along with water content by heating the butter just over 1000°C to getpure ghee after filtration of residue.

- **Recent studies**

Ghee contains 8% lower saturated fatty acids which makes iteasily digestible. Due to having 4-5% linoleic acid, an essential fattyacid, it promotes proper growth of human body. Ghee also containsvitamin A,B,E and K. Vitamin A and E are antioxidant and are helpfulin preventing oxidative injury to the body (A cause of about 80-90%degenerative diseases). Vitamin A also keeps epithelial tissues of bodyintact, keeps outer lining of eyeball moist and prevents blindness.Ghee is lipophilic and this action of ghee facilitates transportation ofingredients of formulation to target organ and final delivery inside thecell, because cell membrane also contains lipids. This lipophilic natureof ghee facilitates entry of formulation in to the cell and its delivery tomitochondria, microsome and nuclear membrane. In the process ofevaluating the activities of natural compounds, it is found that whenherbs are processed or mixed with ghee, their activity utility and rateof absorption is potentiated. Thus ghee in general and cow's ghee inparticular is one of the easily digestible and assailable food whichprovides essential nutrients and critical anti oxidants or free radical scavengers to human body for its protection and growth.

- **The lipids serve the following important function**

- Structural components of bio membranes (phospholipids)
- Metabolic regulators (steroid hormone and prostaglandins)
- Storage forms of energy (Triglycerides)
- Acting as electric insulator in neurons.
- Adding taste and palatability to food

Fatty acids having carbon atoms 4 to 6 are called small chain fatty acids(SCFA), those with 8 to 14 carbon atoms are known as medium chain fatty acids(MCFA); those with 16 to 18 carbon atoms are long chain fatty acids (LCFA)and those carrying 20 or more carbon atoms are named as very long chain fattyacids (VLCFA).Short chain fatty acid (SCFA), butyric acid (4C) and caproic acid (6C) are present in ghrita. Digestion and metabolism of SCFA and MCFA are drastically different from those of LCFA, containing triglycerides do not require prolonged digestion, also not required any pancreatic lipase or bile salts. They diffuse directly in to portal circulation and taken to the liver and are immediately utilized for energy. SCFA and MCFA are preferentially oxidized by peripheral cells and so they are not deposited in adipose tissues.

Linoleic acid and linolenic acid are the only fatty acids which cannot besynthesized in the body. Archidonic acid is the precursor of prostaglandin. Prostaglandin are local hormones and function through G-protein coupledreceptor this hormones combine with the specific receptor on the plasmamembrane. The H-R complex activates the regulatory component of the proteindesignated as protein is a peripheral protein. The G-protein is a peripheralmembrane protein which carries the excitation signal to adenylate cyclase and it embedded in the plasma membrane. Prostaglandin also effect on inflammationand immunity.Vitamin E is the most powerful natural anti-oxidant; free radicals arecontinuously being generated in living systems. Their prompt inactivation is ofgreat importance. The free radicals would attack bio membranes. Vitamin E protects RBC from haemolysis. By preventing per-oxidation it keeps thestructural and functional integrity of all normal cell. Vitamin E also boostsimmunity.In saturated fatty acids PUFA are essentially fatty acids which carrying medicament micelle form to penetrate in any normal cell after that Beta oxidation occurs and medicament release to the target cell to shows their effect. Its digestibility Co-efficient and the rate of absorption is 96% which ishighest of all oils & food. Vitamin A & E are anti-oxidant help inpreventing oxidative injury to the body.

- **Scientific Facts About Cow Ghee**

The use of cow ghee does not increase cholesterol. It gives no bad effecton heart. Recent studies have shown that traditional cooking fats like pure ghee are healthier due to an ideal ratio of omega 6 to omega 3 fattyacids. It is not advisable to restrict all forms of fats as severe restriction results in mental and physical depression.

According to Russian Scientist Servos, Cow's ghee has immense powerto protect human body from the ill effect of radioactive waves, evaporation. There is due is filtered out as pure ghrita. The melting point of Ghee is 35^0C. which is less than the normal temperature of the human body. Recently some studies have shown that cow ghee contain variousanticarcinogen, 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, leukemia, mesothelioma, and glioblastoma showing their anti carcinogenic activity The value of sphingomyeline contain in cow ghee is 9.31mg/100g. has stated that the anticarcinogenic effect of ghee ismainly attribute to its biologically active metabolites ceramide and sphigosine. This may contribute to the suppression of oncogenesis. Kumar et al (2000) suggest that hypocholesterolemic effect of ghee ismediated by increasing the secretion of biliary lipids. Ghee is observed toimprove the growth rate and digestibility studies.Ghee also improves digestibility of other component .Mineral absorptionfrom diet.. Cow ghee increases the retention of calcium up to 45% andphosphorus up to 57% (kehar 1956, steggarada 1951).
As chemically ghirta is consist of phospholipids, fatty acids etc . It is helpful in correcting the altered disturbed neurotransmitter Ghrita is fortified with medhya drugs. It releases the medhya effect of drug atneurotransmitter working place (synapse etc.)

- **Action of Goghrita in Brain**

The nervous system governs all bodily functions, and the brain is a part of the central nervous system (CNS), which is in charge of organizing the proper motor motions and integrating and coordinating sensory data.[6] The Blood Brain Barrier (BBB), a highly selective and intricate barrier, shields the brain. It is a semipermeable membrane that sits at the border where brain tissue and blood meet. The blood-brain barrier's primary job is to shield the central nervous system (CNS) from potentially dangerous substances that enter the bloodstream. It also gives it the energy and nutrition it needs to perform normally.[7]Goghrita's ability to dissolve in lipids facilitates its entry into cells and subsequent delivery to the mitochondrion, microsome, and nuclear membrane. Ghrita will spread throughout the intended locations, such as the neurological system, after being rapidly absorbed. The medications that are soluble in lipids can enter extracellular and intracellular regions fast. Lipophilic in nature, the blood-brain barrier (BBB) divides circulating blood from CNS tissue and allows specific medicines and lipids to flow through. Goghrita's 4.0–5.0 lipophilic nature allows it to penetrate some of the hardest-to-reach places, including the central nervous system. Goghrita contains linoleic acid, which has a similar rate of blood-brain barrier crossing as other polyunsaturated fatty acids.[9]

❖ Discussion and Conclusion:

- Because Goghrita is lipophilic, it can easily cross the blood-brain barrier and reach the target, meaning that it has greater bio-availability.
- Additionally, because of its Rasayana property, long-term use of Goghrita will help to reduce the recurrence of brain disorders.
- Whenever we process any drugs with Goghrita, it has a unique ability to absorb the medicinal contents and properties; therefore, if we prepare the formulations for specifically functions on brain using goghrita, they could be more beneficial and effective.
- For improving Dhi, Dhriti, Smriti, and Medha, ghrita is regarded as Shreshta.
- Goghrita is regarded as the best kind of Ghrita out of the eight varieties.
- This would aid in the creation of superior Rasa Dhathu and other Dhatus, particularly Majja Dhatu, taking into account the attributes of Goghrita, such as Madhura Rasa, Guru, Sangdha Guna, and Madhura Vipaka.

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