Panchagavya Pulse: Nature's Revitalization Review

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Abstract-Panchgavya represents milk, urine, dung, ghee, and curd, derived from cow and serves irreplaceable medicinal importance in Ayurveda and traditional Indian clinical practices. In Ayurveda, Panchgavya treatment is termed as 'Cowpathy'. In India, the cow is worshipped as a god called 'Gaumata,' indicating its nourishing nature like a mother. Ayurveda recommends Panchagavya to treat diseases of multiple systems, including severe conditions, with almost no side-effects. It can help build a healthy population, alternative sources of energy, complete nutritional requirements, eradicate poverty, pollution-free environment, organic farming, etc. Panchgavya can also give back to mother nature by promoting soil fertility, earthworm production, protecting crops from bacterial and fungal infections, etc. Scientific efforts shall be taken to build evidence for the clinical application of Cowpathy. The present review aims to summarize the health and medicinal benefits of Panchgavya.

I. INTRODUCTION

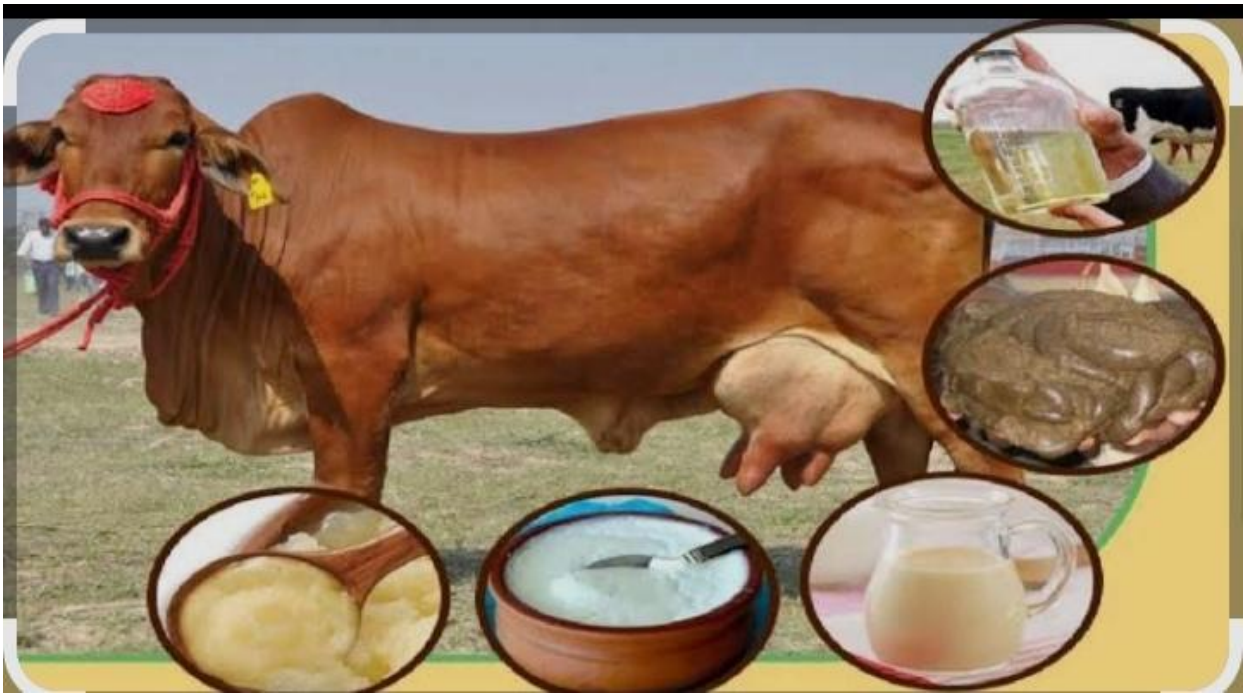
In India, the cow represents Mother Earth and is commonly called 'Gaumata' because of its nourishing nature. In Ayurveda, cow products have been used since ancient times for a healthy body, therapeutic purposes, and pharmaceutical processes.

Panchagavya is a mixture prepared by using five ingredients derived from the cow. The three direct ingredients are cow dung, cow urine, and cow milk, and the two derived products are ghee and curd; each of which represents 'Gavya', i.e., obtained from Gou (Cow). Each Gavya can be used individually or in combination with other products.

Any product generated from food sources having additional health advantages in addition to the essential nutritional content contained in foods is considered a nutraceutical. The long-standing consumer acceptability of nutraceuticals is brought about by their association with conventional

medicine. Although the idea of nutraceuticals has grown in popularity recently, it has its roots in the traditional Ayurvedic medicine of ancient India.

Any product generated from food sources having additional health advantages in addition to the essential nutritional content contained in foods is considered as a Nutraceutical. The 'Nutraceutical revolution' and the search for complementary or alternative beneficial goods have been spurred by consumers' demands for quality of life. The long-standing consumer acceptability of nutraceuticals is brought about by their association with conventional medicine. Although the idea of nutraceuticals has grown in popularity recently, it has its roots in the traditional Ayurvedic medicine of ancient India.



Panchagavya Composition

(1) Cow Urine:

Cow urine has a long history of use in traditional Ayurvedic medicine, and some preliminary scientific research suggests it may have certain beneficial properties. However, the extravagant claims that it can cure thousands of diseases, including major ones like cancer and diabetes, are not supported by modern scientific evidence.

While it may have a role in certain traditional practices, it should not be considered a miracle cure or a substitute for proven medical treatments. Anyone considering its use should do so with extreme caution, be aware of the significant risks of contamination, and always consult with a qualified medical doctor before using it to treat any health condition.

(2) Milk:

In Ayurveda, cow milk is considered a unique source of nourishment, one that isn't easily replaced by other foods. When digested well, it's believed to promote positive emotions, nourish the body's

tissues, and help balance its fundamental energies, or Doshas. It's also seen as a vital nutrient for building "Ojas," the essential energy that sustains life. Ancient Indian texts from traditional medicine systems have long documented these therapeutic properties, praising milk for its wide-ranging health benefits.

From a nutritional standpoint, Indian cow milk is rich in essential components. It is about 86% water, with the rest made up of approximately 4.65% fat, 4.6% lactose (a natural sugar), 3.4% proteins, and 0.54% minerals. The proteins in milk are diverse, consisting of alpha-casein (36%), beta-casein (27%), gamma-casein (9%), and peptides (27%). About 3% of milk is casein, which exists in a colloidal state along with pigments like carotene and riboflavin, which give milk its slight color.

Beyond this, milk is an excellent source of calcium and phosphorus, crucial for bone health. It also contains important fatty acids, phospholipids (like lecithin), and vitamins such as A, B2, B3, and K.

(3) Cow dung:

Cow dung is antiseptic. It possesses fungicidal and antibacterial properties. As a result, one of the primary components of skin ointments, which are helpful in serious skin problems like psoriasis, eczema, and gangrene, is a filtrate of the suspension created by completely mixing cow dung and water.[3] Numerous helpful microorganisms, including Saccharomyces, Lactobacillus, Bacillus, Streptococcus, Candida, and others are abundant in cow manure. Additionally, it includes a variety of dietary ingredients such cellulose, hemicellulose, mucus, lignin, minerals, vitamins, potassium, nitrogen, oxygen, and carbon.[14] The use of a dried cow dung cake as a fuel source for cooking reduces the need for alternative energy sources, is completely harmless to the environment, and assures air purification by eradicating the airborne germs in rural parts of India. Gobar gas (biogas) plants are another important source of energy. They turn cow dung into methane gas, which is used to fuel electricity production and for cooking.[7] Additionally, toothpaste made from cow dung enhances dental health and offers defence against oral infections. The usage of cow dung provides more economical and environmentally friendly human activities.[18] Additionally, antibacterial and antifungal properties of cow dung have been proven. It works as a skin toner and is successful in treating eczema and psoriasis. Neem leaves that have been crushed and cow dung work well to treat boils and heat rashes.

(4) Curd:

A by-product of cow milk is Dahi (curd). Dahi is the Sanskrit word for curd. The features and benefits of Ayurveda have been discussed in writing by all of its most eminent practitioners, including Charaka and Sushruta. It is regarded as one of the healthiest foods in the entire globe. Curd is useful as a medicine for numerous illnesses. It is regarded as a tonic and is said to possess qualities that delay premature aging. Curd is also helpful for people with diarrhoea and dysentery, and it is advised for those with chronic specific and non-specific colitis.[3] Curd, also called ‘yogurt’ or “Dahi”, is consumed worldwide due to its high nutritional value and health benefits. It

is prepared by fermenting cow milk using microorganisms viz Streptococcus, Acidophilus, and Lactobacillus. Ayurveda prescribes certain precautions carefully considering the health of individual, environmental and climatic conditions for consumption of curd. Curd contains several nutrients and micronutrients, including water, proteins, vitamins like A, B, D, and E; minerals like calcium, phosphorus, magnesium, zinc, etc. Probiotics present in curd help in strengthening the immune system and digestive system, whereas various minerals, vitamins, and proteins in curd help fight against multiple pathogens, including HIV. It is used to treat digestive ailments as it can resist the growth of harmful microorganisms and promote good gut flora to improve digestion. Curd also acts as a blood purifier and helps in lowering the total cholesterol, and lowdensity lipoproteins, thus, preventing the risk ofindividual, environmental and climatic conditions for consumption of curd. Curd contains several nutrients and micronutrients, including water, proteins, vitamins like A, B, D, and E; minerals like calcium, phosphorus, magnesium, zinc, etc. Probiotics present in curd help in strengthening the immune system and digestive system, whereas various minerals, vitamins, and proteins in curd help fight against multiple pathogens, including HIV. It is used to treat digestive ailments as it can resist the growth of harmful microorganisms and promote good gut flora to improve digestion. Curd also acts as a blood purifier and helps in lowering the total cholesterol, and lowdensity lipoproteins, thus, preventing the risk of obesity, antifungal effect for treating dandruff from hair and treating piles.

(5) Ghee:

According to Ayurveda, cow's ghee is considered one of the most beneficial fats for human consumption. It is revered not just as a food but as a medicinal substance that promotes overall health.

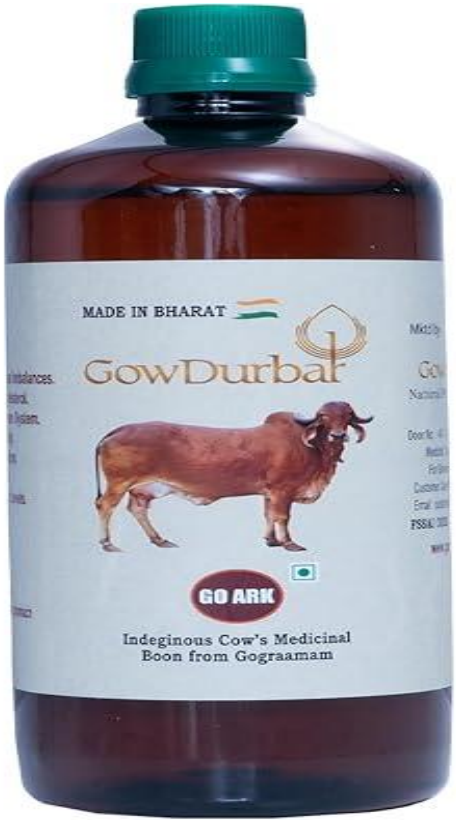
Proponents believe that regular, moderate intake of cow's ghee offers a wide range of benefits:

- Enhances Vitality: It is said to improve physical strength and mental alertness.
- Supports Bodily Tissues: It is believed to maintain the health of tendons, muscles, and bones, keeping them strong yet flexible. It is also thought to improve eyesight.
- Promotes Detoxification: Ghee is considered not only nourishing but also helps in cleansing the body of toxins.
- A Note on Heart Health: Some Ayurvedic texts suggest that ghee, especially when made from the milk of grass-fed cows using the traditional Vedic method, can be beneficial. However, this perspective differs from modern medical advice, which recommends limiting saturated fats for those with high cholesterol. It is essential to consult a healthcare provider for personalized advice.
- Prepration Method of Formulation:
- Cow products have a long history of use in Ayurveda for therapies, pharmaceutical processes, and maintaining good health. Classical texts contain *sutras* that detail the various characteristics and applications of milk, curds, ghee, urine, bile, feces, horns, and other bovine substances.

The formulations, combining urine distillate with mineral oil or cow ghee and other surfactants, displayed desirable consistency and stability, remaining uncontaminated over a six- month storage period.The comprehensive analysis of mineral composition, FTIR-identified functional groups, antioxidant activity, and formulation stability demonstrated the potential of cow urine-based formulations as effectivets, offering a strong foundation for Antimicrobial activity , Anticancer , Antiallergic ,Antidiabetic ,Antifungal

II. PREPARATION OF PANCHGAVYA AS NUTRACEUTICALS

(1). KAMDHENU:



The term "Kamdhenu" refers to products derived from cows, often within the traditional concept of Panchagavya (a mixture of cow milk, curd, ghee, urine, and dung), which is being researched for its potential as a nutraceutical. The preparation methods focus on processing these cow products into more palatable and stable forms, such as extracts or distillates, that are suitable for consumption as nutraceuticals.

Preparation Methods

Due to the unpalatability of some raw Panchagavya ingredients (like cow dung and urine), preparation as a nutraceutical involves specific processing techniques to reduce drawbacks and make them consumable.

(1) Extraction and Distillation: Specific extracts can be prepared using methods like maceration. For example, "Kamadhenu Ark" refers to cow urine distillate, which is used in preparing various extracts in research settings.

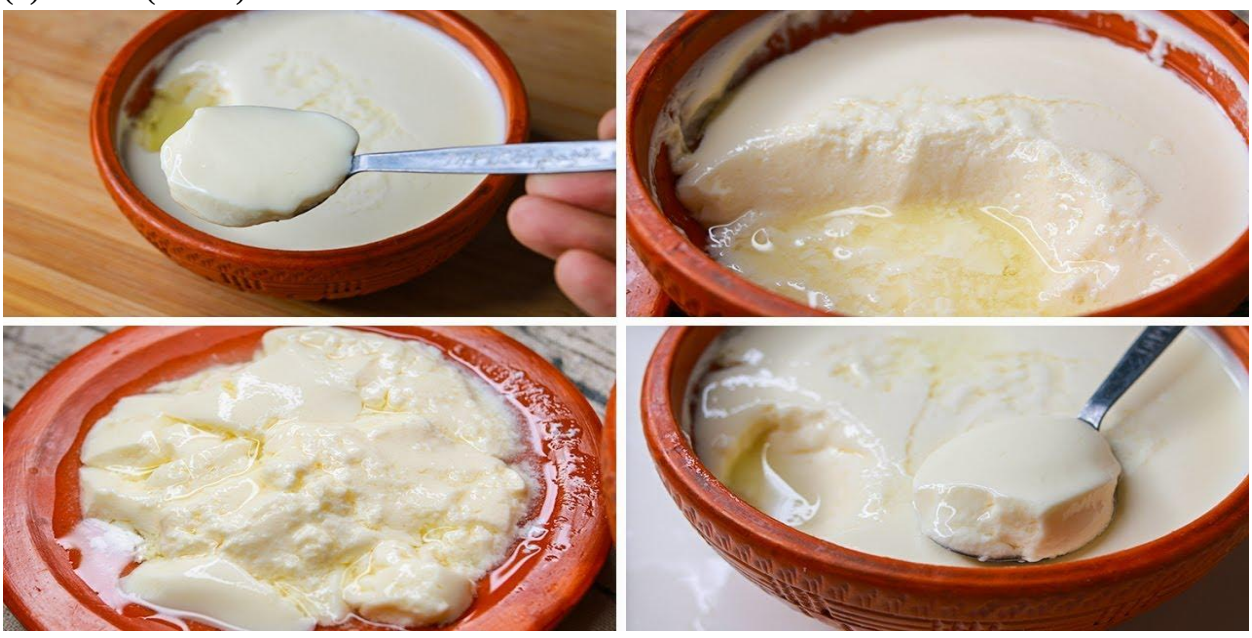
(2) Formulation into Palatable Forms: Research suggests incorporating Panchagavya into forms like capsules, tablets, or other palatable formulations to mask the original taste and smell, making it accessible to a wider audience, including children and adults.

(3) Combination with Other Ingredients: Cow products can be combined with other functional ingredients. One study mentioned the preparation of extracts using Kamadhenu Ark with sprouted millets to enhance antioxidant and phytochemical properties.

(4) Standardization; To ensure widespread acceptance and safety, processing techniques and standardization methods for these nutraceuticals need to be established, including an understanding of their pharmacokinetics and pharmacodynamics.

Potential Applications and Benefits; The resulting nutraceuticals are associated with various physiological benefits rooted in traditional Ayurvedic medicine

(2) CURD (DAHI):



Dahi is made by boiling milk and letting it cool to lukewarm before adding a small amount of existing dahi or culture to it. The mixture is then left in a warm place for several hours to allow the bacteria to ferment the milk, a process that results in the thick, slightly sour curd. After it has set, it is refrigerated to stop the fermentation process.

(1) Boil milk: Bring milk to a boil and let it simmer for a few minutes. For a thicker curd, simmer for longer, stirring occasionally.

(2) Cool the milk: Allow the boiled milk to cool until it is lukewarm or a comfortable temperature to the touch. The milk should not be too hot, as this can kill the bacteria in the starter.

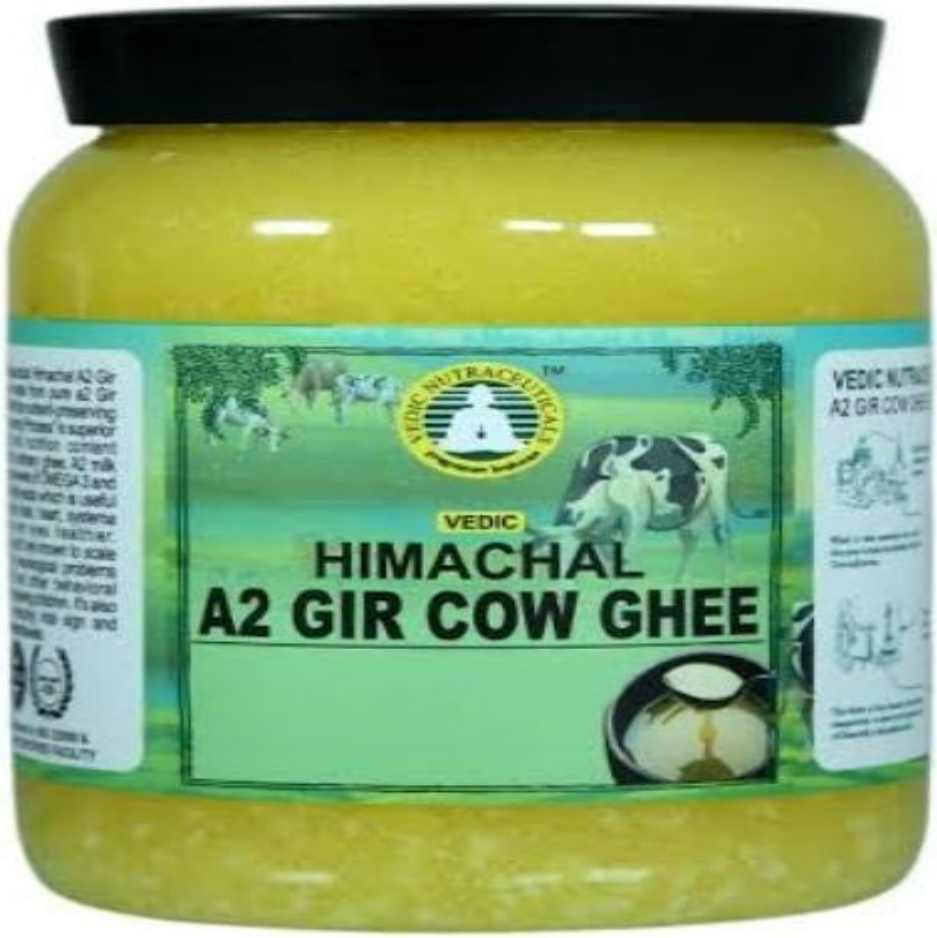
(3) Add starter: In a small bowl, take a spoonful of curd (the starter) and mix it with a little of the warm milk to create a smooth mixture.

(4) Combine and mix: Pour the starter mixture into the rest of the warm milk and whisk or stir gently to combine thoroughly.

(5) Ferment: Pour the mixture into a container, cover it, and place it in a warm spot. Let it sit undisturbed for 6 to 8 hours, or until it is set. The setting time depends on the temperature, with colder weather requiring longer fermentation.

(6) Chill: Once the curd is set, place the container in the refrigerator for a few hours to help it set completely and to stop the fermentation process

(3) GHEE:



Ghee is considered a valuable nutraceutical (functional food) in both traditional Ayurvedic medicine and modern wellness due to its rich composition of beneficial fatty acids and fat-soluble vitamins. It is primarily prepared through a heat clarification process that removes milk solids and water from butter.

Step 1: Melt the butter
Place unsalted butter in a heavy-bottomed pot or saucepan. Heat over medium-low heat until the butter is completely melted.

Step 2: Simmer the butter
Once melted, reduce the heat to low. Let the butter simmer. A foam will form and then disappear as the water evaporates. Continue to simmer, stirring occasionally. The milk solids will begin to separate and sink to the bottom.

Step 3: Cook until golden-brown
Keep simmering until the milk solids at the bottom turn a light golden-brown color and the liquid ghee becomes clear and golden. This can take anywhere from 10 to 30 minutes, depending on the heat level. Be careful not to let the solids burn.

Step 4: Strain the ghee Turn off the
heat and let the mixture cool slightly. Place a fine-mesh strainer lined with cheesecloth or a paper towel over a clean, heat-proof jar or container. Carefully pour the ghee through the strainer to separate it from the browned milk solids at the bottom of the pota

Step 5: Store the ghee Allow the ghee to cool completely before covering it with a tight lid. Store at room temperature for a few months or in the refrigerator to keep it longer. The ghee will solidify as it cools.

Application of panchgavya
Pharmacological application: Panchagavya is used in various pharmacological applications, including boosting immunity, treating skin disorders, and acting as an anti-inflammatory, antifungal, and antimicrobial agent. It has also been studied for potential effects against conditions like arthritis, cardiovascular diseases, and certain cancers, though scientific validation is ongoing. Its benefits are often attributed to the combined pharmacological properties of its five components: milk, curd, ghee, urine, and dung.

Key pharmacological applications
1. Immune enhancement: Panchagavya is believed to stimulate the immune system, enhance humoral and cellular responses, and reduce oxidative stress. It is used to improve the body's resistance to infections and fight diseases.

2. Antimicrobial and antifungal properties: Cow dung and urine, in particular, have demonstrated antimicrobial and antifungal activity against various pathogens. It is used to treat skin infections and wound healing.
3. Anti-inflammatory effects: Cow ghee is known for its anti-inflammatory properties and is used to treat inflammation, wounds, and pain.
4. Anti-aging and antioxidant effects: Panchagavya is considered an anti-aging factor that helps prevent free radical formation and repair DNA damage.
5. Digestive health: Curd in the formulation helps in digestion and improves gut flora, while the overall mixture is believed to improve appetite and the assimilation of nutrients.
6. Antioxidant effects: Its components have antioxidant capabilities that may help protect against cellular damage.
7. Anticancer potential: Cow ghee and milk have shown some anticancer properties, and some sources suggest Panchagavya could be beneficial in treating certain types of cancer, though this requires further scientific validation.

Application methods

1) Internal consumption: Panchagavya can be consumed orally, often mixed with warm milk or water, to provide systemic benefits like immune enhancement and detoxification.
2) External application: For skin and hair issues, a small amount of Panchagavya can be massaged onto the affected area and washed off after some time.

Application of panchgavya as Nutrition content:
Nitrogen (N): 1.12% to 2.66%
Phosphorus (p): 0.72% to 0.385%.
Potassium (K): 0.345%. to 0.65%
Calcium 786:3mg1710256-66mg7
Magnesium (Mg): 52.7mg to 92.4mg
Sulfur (5) 08 10.8.3%
Micronutrients. Iron (Fe): 49-7 ma to 53-1 53-Img
Manganese (in): 2.68 mg to5.8smg
Zinc (zn) 4. Jmg to 6.35mg
Copper (64) 12.80 mg 25 to 94.

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