



## **Panchgavya therapy (Cowpathy) in safeguarding health of animals and humans – A review**

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### **Abstract**

All the living creatures on the earth are made up of the five elements of nature, i.e. the Earth, Water, Fire, Air and Space which are all together called as Panchabhootas and their health is affected by Tridoshas, viz., Vadha (air), Pitha (fire) and Kapha (Phlegm). The use of cow derived products has been mentioned in the Vedas and various researchers and scientists have found them to be rich source of essential elements as well as minerals and hormones. For this reason the use of Panchgavya (term used to describe five major substances obtained from cow that include: cow's urine, milk, ghee, curd and dung) and its products is gaining popularity. Panchgavya Therapy/Chikitsa (Cowpathy) has been proposed as an alternate prophylactic and therapeutic approach for sound livestock and poultry health along with safeguarding human health. Its antimicrobial properties have gained the attention of the medical and veterinary professionals. Copper is capable of destroying diseases and comprehensively act as an antidote; plays role in immune enhancement; capable of removing all the ill effects and imbalances in the body and requires special mention in the treatment of diabetes and cancer; in case of acquired immunodeficiency syndrome (AIDS) and as an antifungal agent. Cow urine concoction (CUC) is having anticonvulsant and hypoglycemic effects; and useful against liver disorders and fever; inflammations and anemia. Cow milk is considered as a healthy food and is found to be effective in curing fever and pain; tumors; diabetes; kidney disorders and weaknesses and importantly act as a medium to administer medicine. Milk has also got fungicidal properties; when used with leaves of medicinal herbs possess aphrodisiac property and milk fat has anticancer activities. Milk products viz. toned and skimmed milk; lassi, yoghurt, cottage cheese and khoa possess essential medicinal properties. Curd (dahi) is a blood purifier, and found useful in blood related problems; piles and gastro-intestinal disorders. Cow ghee has immunostimulatory properties. The application of cow dung to kill the germs of malaria and tuberculosis along with its antifungal properties require special mention. This review deals with all these versatile qualities of the components of panchgavya for safeguarding health of animals and humans.

**Keywords:** Panchgavya; cowpathy; health and diseases; animals; humans

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### **Introduction**

All the living creatures on the earth are made up of the five elements of nature, i.e. the Earth, Water, Fire, Air and Space which are all together called as Panchabhootas and their health is affected by Tridoshas, viz., Vadha (air), Pitha (fire) and Kapha

(Phlegm). Any disturbance in the harmony of natural ratio of the five elements may cause the disease. On the basis of these fundamental principles of life, different remedial systems were developed i.e. Vrikshayurveda for plants, Mrigayurveda for animals and Ayurveda for human beings (Caraka-Samhita, 1981). As components of bioprospecting animal products can be used having

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great implications for medicines as well as environment and economy; public health and culture (Alves and Rosa, 2005). Panchagavya is a term used to describe five major substances, obtained from cow, which include cow's urine, milk, ghee, curd and dung. Panchgavya therapy or cowpathy utilizes these five products, as these possess medicinal properties and are used singly or in combination with some other drugs of herbal, animal or mineral origin for treatment of several disorders and diseases like flu, allergies, colds, cough, arthritis, rheumatoid arthritis, leucorrhoea, leucoderma, alopecia, asthma, hyperlipidemia, renal disorders, dietary and gastrointestinal track disorders, acidity, ulcer, wound healing, heart disease, asthma, skin infections/diseases, tuberculosis, chicken pox, hepatitis, leprosy and other bacterial/viral infections, aging, chemical intoxication, worm infestations, obesity etc. These remedies seem to be beneficial even for dreaded diseases like cancer, acquired immunodeficiency deficiency syndrome (AIDS) and diabetes. Immunostimulatory, immunomodulatory and anti-inflammatory activity of Panchagavya is already being mentioned in Ayurveda (Chauhan, 2003, 2005; Dhama et al., 2005). Recently, studies conducted in albino rats have determined the central nervous system action of panchgavya on spontaneous motor activity as well as muscle tone and pain (Paliwal et al., 2013).

The cow derived products contains more nitrogen and sulphur; phosphate; sodium and manganese; carbolic, succinic and citric acid; iron, silicon and chlorine; magnesium and calcium salts; Vitamins (viz. A, B, C, D, E) and minerals; and hormones. Under both aerobic and anaerobic conditions they enhance cellular metabolism in prokaryotes thereby paving the way for novel secondary metabolites (including drugs as well as enzyme production) ([www.articles.timesofindia.indiatimes.com](http://www.articles.timesofindia.indiatimes.com)). The Panchagavya products also show many other beneficial applications viz., excellent and economical agricultural usages in the form of biofertilizers, vermicompost and biopesticides (cow urine and dung are useful in organic farming as good quality natural manure) which improves the soil fertility, results in increase in yield, quality and taste of the agricultural produce, and provides food grains free from health hazards of using chemical fertilizers/pesticides; high nutritional value (cow milk, curd and ghee); alternate and a cheaper source of energy, biogas, fuel and electricity (cow dung and urine) can reduce consumption of limited fossil fuels and non-renewable energy inputs and lighten all homes at no recurring costs by providing cheap fuel widely be available to the masses and solve electricity problem; environment protection through promotion of biogas which can check deforestation practices due to forced cutting of trees for cooking fuel and is of high importance in the current scenario of fuel energy

becoming scarce and costly, also gobar (dung) has been found to be resistant to solar radiation and cow ghee can protect human body from the ill effect of radioactive waves; and of economical values as Panchgavya is vital to cattle based rural economy and has the potential of improving financial condition of farmer and landless labor (Chauhan, 2004; Dhama et al., 2005; Alves, 2008; Dhama et al., 2013).

Indian cow breeds are unique and distinct species, both in their appearance and characteristics. It is known as “Kamdhenu” and “Gaumata” because of its nourishing nature like mother, the giver of all providing riches to humanity, and is a store of medicines. Every product of panchgavya has distinct qualities and uses in health, agriculture and other fields. Historically, Maharshi Vasishtha served the divine “Kamdhenu” Cow and Maharshi Dhanvantari offered to mankind a wonder medicine “Panchagavya” (Chauhan and Singh, 2001; Garg and Chauhan, 2002). Due to evolving drug resistance of microbes/pathogens especially the situations like emerging antibiotic resistance, residual toxicity and food safety concerns, and the concerns regarding harmful effects of allopathic medicines, nowadays novel and safer therapies viz., herbal, bacteriophage and others including of panchgavya therapy and nutritional immunomodulatory approaches are gaining popularity and need special attention for their propagation as well as publicity (Mahima et al., 2012&2013; Dhama et al., 2013; Tiwari et al., 2013). The present review describes the panchgavya elements and their beneficial health applications and therapeutic potential for safeguarding health of animals and humans.

### **Panchgavya therapy (Cowpathy)**

“Panchgavya Therapy/Chikitsa” (Cowpathy) has been proposed as an alternate prophylactic and therapeutic approach for sound livestock and poultry health along with safeguarding human health (Dhama et al., 2005a; Mathivanan et al., 2008). Panchgavya products have been found to be beneficial in curing several human ailments and enhance the body's immunity and resistance to fight various infections. Cowpathy induces immunomodulation by enhancing both cellular and humoral immune responses, upregulates the lymphocyte proliferation activity, secretion of cytokines and macrophage activity; reduces apoptosis in lymphocytes thus helping them to survive and fight infection; acts as anti-aging factor by preventing the free radicals formation and efficiently repairing the damaged DNA (Dhama et al., 2005a). Also, immunity is reducing drastically as a result of the environmental pollution, use of agrochemicals in agriculture and presence of pesticides, heavy metals, fungal toxins etc. in the food chain, in this scenario cowpathy is a good alternative (Dhama et al., 2013).

Panchagavya in appropriate dilutions has been found as promising growth enhancer of micro-organism hence it adds to the soil fertility by avoiding the use of chemical fertilizers, and with marked antifungal properties it can be used as a successful microbiological growth medium as well. Panchagavya at higher dilution are found to be promising source for simple and naturally derived bacteriological media that are less expensive because of additional antifungal effect with growth promotion (Joseph and Sankarganesh, 2011). However, it is quiet noteworthy that direct antibacterial activity is not exerted by panchgavya, femented panchgavya (at 30 days of age) is useful as a growth promoter due to better proposition of chemical as well as microbial composition (Mathivanan et al., 2006a; Mathivanan and Edwin, 2012). Panchgavya when used along with plant like *Andrographis paniculata* can act as an alternative to antibiotic growth promoter and enhances productivity of broiler industry (Mathivanan et al., 2006b). It also possesses ameliorative effect on certain viral diseases (e.g. New Castle disease in layer chicken) (Sumithra et al., 2013).

#### Cow urine

Urine in general has got antimicrobial property. Heavy medication of allopathy has frustrated people for which they are now using cow urine: an important element of panchgavya (Ogunshe et al., 2010; <http://www.cowindia.org/dung&urine.htm>). It acts as an integral component of Panchagavya in enhancing immune responses as have been tested by various workers (Kumar et al., 2004a; Dhama et al., 2005a). Cow urine fulfils the deficiency of elements and reduces the increased elements in the body. It contains 24 types of salts and the medicines made from cow urine are used to cure several diseases (Tietze, 1996; Dhama et al., 2005a). The contents of cow urine include: 95% water, 2.5% urea; minerals and salt; 2.5% hormones and enzymes. Alongside all these it also contains calcium and phosphorus; salts and carbonic acid; potash, nitrogen and ammonia; manganese and iron; sulphur, phosphates and potassium; urea and uric acid; amino acids and enzymes; cytokine and lactose etc. (Bhadauria, 2002). Copper is capable of destroying diseases and comprehensively act as an antidote. Probable role in immune enhancement are played by cytokines and amino acids. Singularly, gomutra has got all such chemical properties as well as potentialities and constituents capable of removing all the ill effects and imbalances in the body (Chauhan et al., 2001a; Chauhan, 2003). The excision wound model in Wistar albino rats reveal that cow urine hasten the process of wound healing due to external injuries (Sanganal et al., 2011).

Cow urine kills a number of drug resistant bacteria and viruses and is being used even for dreaded /

untreatable diseases like cancer, AIDS, diabetes and skin problems. Improvements have been shown with those suffering from flu, allergies, colds, arthritis, aging, bacterial/viral infections, chicken pox, small pox, tuberculosis, enteritis, constipation, hepatitis, leprosy, ear infections, obesity, gastric ulcer, depression, heart disease, asthma, tetanus, Parkinson disease, Athletes feet, fever, eczema fatigue, wounds, stones, etc (Maheshwari et al., 2004; Dhama et al., 2005a, 2005b; Jarald et al., 2008; Jain and Mishra, 2011). It is one of the best appetizers. Most of the medicines are made by distilling urine and collecting vapours known as the “Ark” (distillate) (Krishnamurthi et al., 2004). The most striking features of such invention is that the facilitated action as well as effectiveness of the ‘Arka’ is achievable at nano to micro molar levels; thereby requiring very low dose to cure cancer. This ultimately reduces the treatment cost. The grant of U.S. Patents to Council of Scientific and Industrial Research (CSIR), India for medicinal properties of cow urine particularly for the its use along with antibiotics for the control of bacterial infection and its use in tuberculous patients and fighting against cancers has attracted global attention (Finley, 2003; Dhama et al., 2005a, 2005b; Jain et al., 2010). “Cow Urine Therapy / Chikitsa” as an alternate prophylactic or therapeutic approach proves to be safer as well as cheaper and without any side effects for fighting cancer, the most dreaded and incurable malady. Cow urine has got direct implication in case of urinary tract cancer and its use facilitates reduction of doses of drugs and at the same time it acts as a bioenhancer (Dhama et al., 2005b; <http://www.cowurine.com>). ‘Ark’ has been identified as a bioenhancer of commonly used antibiotics, anti-fungal and anti-cancer drugs and reduces the dose and duration of treatment. If given along with antibiotics also prevents development of resistance in microorganisms against antibiotics (Bhadauria, 2002). In the United States, a patent has been submitted specifically for a distillate of cow urine that causes enhancement of the activities of antifungal as well as antimicrobial and anticancer agents (Khanuja, 2002; Saxena et al., 2004). Due to the presence of quinolones and flavoquinolones cow urine has been shown to possess significant fungicidal properties. Antifungal activities have been recorded against many fungal agents viz., *Fusarium oxysporum*, *Claviceps purpurea*, *Rhizopus oligosporus*, *Aspergillus oryzae*, *Curvularia spp*, *Alternaria helianthi* and *Cladosporium spp*. (Ravikumar, 2007). As a bioenhancer and in order to increase the efficacy of the antibiotics against infectious agents cow urine has got enormous importance. Bioenhancement has also been observed with other drugs viz., Ampicillin, Isoniazid, Clotrimazole, Cyanocobalamine etc. Bioenhancer activity has been found to reduce the antibiotic dose per day and duration of treatment in tuberculosis patients

(Joshi, 2002). Thus as a bioenhancer of the activities of commonly used antibiotics as well as anti-fungal and anti-cancer drugs cow urine distillate fraction is important. Increase in the activity of rifampicine (used against tuberculosis as a front line drug) by about 5-7 folds against *E. coli* and 3-11 folds against Gram-positive bacteria with the aid of cow urine has been reported to be quiet noteworthy. There is also increase in the potency of taxol (paclitaxel) against MCF-7, a human breast cancer cell line in *in-vitro* assays (US Patent No. 6,410,059) (The Hindu, 4 July, 2002; The Indian Express, 4 July, 2002)

Cow urine enhances the immunocompetence and improves general health of an individual, and is considered as one of the most effective substance/secretion (water of life or “Amrita”-beverages of immortality) of animal origin (Barnett, 1988). It activates the macrophages and augments their engulfment and phagocytosis power as well as bactericidal activity. It also enhances both cellular as well as humoral immune responses. In mice, cow urine has been shown to enhance both T and B cell proliferation and also increases the level of IgG, IgA and IgM antibody titres. It also increases the secretion of interleukin-1 and 2 (Chauhan et al., 2001a, 2004). Due to having antiseptic and immunologically modifying properties cow urine has been beneficially applied in wound healing in dogs and rats. Cow urine aids the lymphocytes to survive and not to commit suicide. It also repairs the damaged DNA (Chauhan et al., 2001b; Gosavi et al., 2011). Among all sorts of urines, the urine of the Indian cows is most effective. It can cure disorders, is non-toxic and can be obtained free of cost trough domestication of cow (Chauhan and Sharma, 2002).

In poultry, cow urine enhances the immunocompetence status of birds and provides better protection in conjunction with vaccination. It also increases egg production and egg quality, and upregulates the lymphocyte proliferation activity (Garg et al., 2004). Beneficial effects on serum biochemical profile (total serum protein, glucose, calcium, cholesterol) of laying birds, positive effect on their body weight gain, haematological profiles (Mathivanan and Kalaiarasi, 2007) and immunomodulatory effect on both the humoral and cellular immune responses have been reported (Kumar et al., 2004b).

Regarding general health, by its regular use one can get the charm of a youth as it prevents the free radicals formation, an anti-aging factor. Orally taking middle stream of morning cow urine is a good tonic and preventative in minor illnesses. Gargling with urine is helpful in throat ache and cold. Vaginal douche is helpful in cure of infections. For massaging/rubbing, hair growth and as an after-shave also one can use it along with its use as pest repellent. For any skin and

nail problems of the feet (athletes foot, ringworm etc.), it can be used as footbaths with good results (Gunter, 1997; Saxena et al., 2004; Dhama et al., 2005a).

Cow urine concoction (CUC) is a popular herbal preparation containing over fifty components with major pharmacological actions of anticonvulsant, hypoglycemic effects, and useful against liver disorders, fever, inflammations and anemia (Oyebola, 1983; Achliya et al., 2003). In the treatment of diseases due to pathogenic bacteria (*Bacillus subtilis*; *Staphylococcus aureus*; *Escherichia coli* and *Enterobacter aerogenes*); opportunistic fungi (*Aspergillus niger*) and helminthes (intestinal roundworm) CUC is found to be highly effective (Panthi and Chaudhuri, 2006; Prashith Kekuda et al., 2010). There is need to provide proper attention to the good virtues of cow urine and in this regard promotional campaigns as well as support in a judicious manner are necessary.

#### Cow milk

Cow milk is a healthy food because of low calorie, low cholesterol and high micro-nutrients, protein, calcium, and vitamins, and plays an important role in meeting requirements of many essential nutrients. It contains carotenes, vitamins A, B complex group and C. It has rejuvenatory health protecting properties and is one of the best vitalizers. It has bio-protective role in human health and is easily digestible (Dhama et al., 2005a). It is found to be effective in curing fever and pain; tumors; diabetes and weaknesses and importantly act as a medium to administer medicine. It delay the processes involved in aging (Sworirajan, 2006). Milk has also got fungicidal properties. While testing milk of cow against powdery mildew (*Sphaerotheca fuliginea*) it has been proven that at high concentration it acts in a better way than the conventional fungicides. Similarly milk can also be used as a fungicidal to protect animal and human health (Bettiol et al., 1999; Francis and Smith, 2007).

Cow milk has been useful in kidney disorders due to its low protein content protein compared to buffalo milk. As a rich source of vitamins like B<sub>2</sub>, B<sub>3</sub> and vitamin A and mineral Zinc it help increasing immunity. Antimicrobial effects are due to immunoglobulins (IgA), lactoferrin, lysozyme, lactoperoxidase and vitamin B<sub>12</sub>-binding protein. Lactoferrin B shows marked antifungal activity (Bellamy et al., 1994; Singh et al., 2004; Dhama et al., 2005a; Mete, 2009). Its yellow substance “Carotene” (Vitamin A) increases visual strength. Cow’s milk allows better absorption of nutrients. Cow milk is a tonic for health, is energetic and conducive to heart and brain, and advances age and potency. It helps in reducing acidity, and thus reduces chances of peptic ulcer. Practically having half the fat content of buffalo milk, cow milk reduces risk of

coronary heart diseases. Low fat content also helps one keep fit and to check obesity. It not only helps against diabetes but also has good sugar for diabetic patients. As natural anti-oxidants it neutralizes oxidative stress produced in body through action on free radicals. A skin care cream containing cream or ghee from cow's milk is said to render the skin fair and smooth (Nautiyal, 2002; Mete, 2009).

Cow milk is best for infant feeding after mother's milk and a good supplementary food for adults. It is a fine blend of all the nutrients necessary for growth and development of young once. Cow's milk is a better source of vitamin K which prevents hemorrhagic disease of newborn, folic acid prevents anemia (Daly et al., 1996; Meisl, 2005).

Cow milk fat component is a potential anti-cancer agent, which help in reducing chances of colon, breast and skin cancer (Dhama et al., 2005b). Conjugated linoleic acid (CLA) in cow milk prevents the uncontrolled spread of cancer-affected cells (Lock and Garnsworthy, 2003).

The milk of cow can be used in various forms as other milk. Skimmed milk powder supplemented with vitamin A, D and pyridoxine, forms a comparatively cheap food of high nutritive value, and is useful for the treatment of malnutrition, nephritic syndrome and liver cirrhosis. Toned milk is a useful source of proteins for malnourished children and pregnant women. As a softer curd/dahi, the protein is used by infants as efficiently as is the protein of human milk. Other products are Khoa (Mava) Chhana (cottage cheese), Yoghurt, Lassi (Butter milk) and Ghee (Clarified butter: Butter-fat). It has been observed that dieters who got dairy products lost 70% more weight than those who avoided it (Singh and Agarwal, 2004; Dhama et al., 2005a).

The milk of a red or black cow which is fed upon specific leaves viz. that of Arjuna (*Terminalia arjuna*), Mash (*Phaseolus mungo* Linn.) leaves or beans or on Ikshu (*Saccarum officinarum* Linn.) can act as rejuvenator and aphrodisiac. Cow milk is being used in many processes of medicinal and spiritual purposes from a very early period of time. It is being used as essential part of "Panchamrit", which is distributed, as prasad after pooja (Dhama et al., 2005a; Rastogi and Kaphle, 2011).

#### **Cow curd (Dahi)**

Curd from cow milk is considered "Vatanashak", blood purifier, "Tridoshnashak" and found useful in "Pitta", blood related problems, piles and gastrointestinal disorders. Cow curd is an efficient probiotic, there is a hope to control infections in a non-drug manner. Cow curd (Dahi) or Matha (whey or butter milk) is considered as digestive, nutritive and useful in gastrointestinal ailments by checking or controlling the growth of harmful organism. A lot of

lactic acid producing bacteria are present in curd and buttermilk that produces antifungal metabolites viz. cyclic dipeptides, phenyllactic acid as well as proteinaceous compounds and 3-hydroxylated fatty acid (Dhama et al., 2005a; Schnürer and Magnusson, 2005). Since the ancient times, curd has been used either with sugar (powdered sugar) or with black salt and zira. In animal health also the whey with salts is given to neonatal calves to treat diarrhea and to get rid of intestinal parasites. In adult animals, particularly the milched buffaloes, it is being given to enhance their production. Along with concentrate whey is given to bullocks to increase their draught power (Singh and Chauhan, 2004).

#### **Cow ghee**

Cow ghee is traditionally believed to improve memory, voice, vision, intelligence and body's resistance to infections. It has anti-ageing factors, exhibits antichollestic 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. Immunostimulant potential of cow ghee in panchgavya formulations has been indicated by increase in neutrophil adhesion, haemagglutination (HA) titre and delayed type hypersensitivity (DTH) responses in rats (Fulzele et al., 2001). Cow ghee when combined to certain selected herbals can cure skin diseases and can facilitate healing of wounds when mixed with honey (Kaur et al., 2001; Simon et al., 2008). Panchagavya Ayurvedic formulation containing *E. officinalis*, *G. glabra*, and cow's ghee is sedative in nature. Panchagavya ghrita also shows hepatoprotective activity in rat liver against carbon tetra chloride poisoning (Achliya et al., 2003).

#### **Cow dung**

Cow dung also possesses antiseptic and disease preventive properties. Cow dung can act as skin tonic. Mixed with crushed neem leaves and smeared on skin - good for boils and heat rashes. Used as tooth polish - toothaches gets removed, so instead of toothpaste which is made of chemicals & dead bones of animals it is a good alternative. The fresh cow dung kills the germs of Malaria and T.B. Smoke from ashes actually increases our eyelids to close and open so many times that lot of water from the eyes comes out which increases the vision life of a person to old age also. Cow dung is antiseptic and has prophylactic (disease preventive) properties (Dhama et al., 2005a). It destroys micro-organisms that cause disease, fermentation and putrefaction. Cow dung has antifungal substance which inhibits growth of even coprophilous fungi and their activity is increased when combined with cow urine. Fresh cow dung is pure but once it has been laid on the

ground awhile, it starts to change (Kulkarni, 2009). Cow dung is definite indication of prosperity as evident from Gobar-dhan Puja, next day of Deepawali (<http://www.science-nature-religion.com>).

The presence of antifungal substance in cow dung is quite noteworthy for inhibiting growth of Corrophilous fungi. *Eupenicillium bovisimosum* present in cow dung produces Patulodin-like compounds viz. CK2108A and CK2801B that possess antifungal activity at a greater rate (Dorothy and Frisvad, 2002; Lehr et al., 2006). In order to study the fate of drugs, cow dung can be considered as a relevant model ecosystem. Isolation of two basidiomycetes viz., strain NRRL6464 and *Cyathus stercoreus* has given rise to the fact that they can degrade lignocellulose and in addition *C. stercoreus* can degrade drug like enrofloxacin (Wicklow, 1992). Again biopesticides exert their harmful effect on animal as well as human health by causing immunosuppression along with autoimmunity and hypersensitivity reactions and it is a burning issue nowadays in a country like India (Chauhan and Singhal, 2006). In this regard the use of cow dung for bioremediation of various pesticides is found to be effective because of the presence of higher concentration of nutrients and larger microbial population (Geetha and Fulekar, 2008; Singh and Fulekar, 2010).

### Panchgavya products

Wide spectrum 'multi-purpose' medicines prepared from Panchgavya are very effective in treating various diseases and enhancing the body resistance to fight diseases. These are being considered as an alternate therapeutic/preventive approach. Several general products obtained from panchgavya elements such as tooth paste/powder, tea, cosmetics, hair oil, massage oil, anti-dandruff shampoo, beauty' soap, tea etc. can provide great relief from the toxic ingredients of chemical products being used currently. Many of these promote growth, increases immunocompetence and are nerve tonics, and help safeguarding health of humans as well as their companion animals (Dhama et al., 2005; [www.indiamart.com](http://www.indiamart.com)). In the scenario of the harmful side effects of antibiotics, drug resistance development and presence of antibiotic residues in food chain one has to think over the alternative therapeutic approaches like panchgavya/cowpathy to control the infections and combat diseases (Dhama et al., 2005a; Randhawa and Kullar, 2011).

### Conclusion and future perspectives

Thus it can be inferred that Panchgavya/Cowpathy, a new version of ancient science, is definitely a promising formulation in the years to come. Therefore, educating people about the benefits of cow and panchgavya can provide solution to problems of

shortage of food grains, fuel, shelter, good health, nutrition, eradication of poverty, and unemployment, and as an alternate source of energy. Application of cowpathy in treating animal diseases needs much promotional activities since only limited literature is available. Having vital medicinal potential and perspectives for the benefit of mankind, the panchgavya therapy needs attention of scientific community for its documented validation, worldwide acceptance, promotion and popularity. A systematic work needs to be carried out on chemical nature, biological activity, microbiology and pharmaceutical aspects and mechanism of bioactive compounds in Panchagavya along with promotional clinical trials both in preventing and treating diseases of humans as well as their livestock. A combined effort of scientist, researchers and clinicians will definitely strengthen this alternate low cost therapy having no side effects, and thus inspire confidence in the public about its good virtues. The panchgavya theory of ayurveda should gain popularity not only in traditional families but also in highly educated and scientific society. Necessary support of scientists as well as researchers and clinicians is desired in order to strengthening the miraculous effects of cow urine therapy and other panchagavya elements, which will inspire both physicians and public to adapt and propagate this wonderful therapy for the beneficial health benefits and help fighting various diseases and disorders of both animals and humans.

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