



Update on Cowpathy: Cow Urine as an Immunomodulator

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ABSTRACT

Cow urine has many beneficial properties particularly in the area of agriculture and therapeutics. Indigenous cattle or zebu cattle is considered as sacred in Indian literature because its products like urine, dung, milk, curd and butter has many wonderful medicinal properties. Among these products cow urine has recently caught the attention of the researchers and a lot of work is going on its medicinal properties. Cow urine is found to have bioenhancing properties, i.e. it adds to the effect of the antibiotics when used in combination. It can be used as an alternative to the antibiotics in feed additives. Cow urine concoction is believed to have anticonvulsant and hypoglycaemic effects; and is also useful for treating liver disorders and fever; inflammations and anaemia. Practitioners of Ayurvedic medicine from India routinely use cow urine as a remedy and the medicines made from it are used to cure several diseases. Improvements have been shown or reported with those suffering from flu, allergies, colds, rheumatoid arthritis, bacterial/viral infections, tuberculosis, chicken pox, hepatitis, leucorrhoea, leprosy, ulcer, heart disease, asthma, skin infections, aging, chemical intoxication etc. Cow urine can kill the number of drug resistant bacteria and viruses. Recently the cow urine has been granted U.S. Patents (No. 6896907 and 6,410,059) for its medicinal properties, particularly for its use along with antibiotics for the control of bacterial infection and fight against cancers. Cow urine contains 24 types of salts and the medicines made from cow urine are capable of curing even the most incurable diseases. Cow urine contains 95% water, 2.5% urea, and 2.5% minerals, salts, hormones and enzymes. It contains iron, calcium, phosphorus, salts, carbonic acid, potash, nitrogen, ammonia, manganese, sulphur, phosphate, potassium, urea, uric acid, amino acids, enzymes, cytokines, lactose etc. Cytokines and amino acids may play a role in immunoenhancement. Cow urine has antioxidant properties; it can prevent the damage to DNA caused by the environmental stress. And interestingly these properties have been found only in the urine of indigenous cow not in the urine of other species like buffalo, goat or not even in cross bred cows.

Keywords: Cowpathy, Immunomodulator, Bioenhancer, Traditional Medicine, Cow Urine Therapy.

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INTRODUCTION

'The cow' is a mobile medical dispensary and Cow urine has a special significance in Indian tradition. Cow urine is said to have a spiritual cleansing effect as well. The cow urine, one of the ingredients of 'Panchagavya' is capable of treating many curable as well as incurable diseases and has been used extensively in ayurvedic preparations since time immemorial as cited in ancient holy texts like Charaka Samhita, Sushruta Samhita, Vridhabhagabhatt, Atharva Veda, Bhavaprakash, Rajni Ghuntu, Amritasagar, etc. A lot of research has been conducted in Cow Urine Treatment and Research Center, Indore over the past few years and it has been reported that gomutra is capable of curing blood pressure, blockage in arteries, arthritis, diabetes, heart attack, cancer, thyroid, asthma, psoriasis, eczema, prostrate, fits, AIDS, piles, migraine, ulcer, acidity,

constipation, gynecological problems, ear and nose problems and several other diseases. The use of cow urine in India can be traced back to the Vedic and probably prevedic period also. Cow urine as such has been most widely referred, used and venerated animal urine owing to its immense therapeutic speciality. While externally it has been used as lotion, ointments and bath, but, internally it has been used in preparation of oral medications and drinks. There is existence of innumerable instances in various ancient medical texts of the curative properties of cow urine for a horde of human ailments. In ancient Indian system of medicine, urine of cow was accepted, used almost as a broad spectrum antibiotic quite akin to that of twenty first century. The cow urine not only used against ailments of diseases as therapeutic agents but also have several other uses as in agriculture and sericulture sectors. So this article attempts to bring forth the diversified use of this heretical portion as was in vogue in ancient Indian system of medicine as gleaned from the ancient medical texts and current scientific findings.¹

Panchagavya constitutes five substances obtained from cow via., urine, milk, ghee, curd and dung. All these products possess medicinal properties and are used singly or in combination with other drugs of herbal, animal or mineral origin for therapeutic purposes of several



disorders and diseases like flu, allergies, colds, cough, arthritis, rheumatoid arthritis, leucorrhoea, leukoderma, alopecia, asthma, hyperlipidaemia, renal disorders, dietary and gastrointestinal track disorders, acidity, ulcers, wounds, heart disease, asthma, skin infections/diseases, tuberculosis, chicken pox, hepatitis, leprosy and other bacterial/viral infections, aging, chemical intoxication, worm infestations, obesity etc. Each panchgavya element has distinct qualities and uses in health, agriculture and other fields. These elements possess high nutritional value (cow milk, curd and ghee), and can act as alternate and cheaper source of energy, biogas, fuel and electricity (cow dung and urine). These remedies seem to be beneficial even for cancer, acquired immunodeficiency deficiency syndrome (AIDS) and diabetes. Immunostimulatory, immunomodulatory and anti-inflammatory activity of panchagavya is mentioned in Ayurveda. Studies conducted in albino rats have established the central nervous system action of panchgavya on spontaneous motor activity, muscle tone and pain.²

Panchgavya Therapy/Chikitsa (Cowpathy)

Panchgavya Therapy / Chikitsa (Cowpathy) has been proposed as an alternate and useful prophylactic and therapeutic approach for livestock, poultry, and human health. Panchgavya products are rich in nitrogen and sulphur, phosphate, sodium and manganese, carbolic, succinic and citric acid, iron, silicon and chlorine, magnesium and calcium salts, vitamin (viz. A, B, C, D, E), minerals and hormones. They are known to cure several human ailments and enhance immunity by inducing immunomodulation through enhancement of both cellular and humoral immune responses, upregulating the

lymphocyte proliferation activity, secretion of cytokines and macrophage activity, reducing apoptosis in lymphocytes. They act as antiaging agents by preventing the free radicals formation and efficiently repairing the damaged DNA. Immunity is reducing drastically due to environmental pollution, agrochemicals, pesticides, heavy metals, fungal toxins, in this background cowpathy is an excellent alternative. Panchagavya in appropriate dilutions is promising growth enhancer of micro-organism useful for soil fertility. Panchagavya at higher dilution is used as a bacteriological media having additional antifungal effect with growth promotion. Fermented panchgavya (at 30 days of age) is useful as a growth promoter due to better proposition of chemical as well as microbial composition. Panchagavya when used along with a plant such as *Andrographis paniculata* can act as a growth promoter for broilers. It also helps in ameliorating certain viral diseases (e.g. New Castle disease in layer chicken).^{3,4}

Panchgavya products have been suggested to be useful and beneficial for prophylactic and therapeutic purposes in the following diseases/ disorders viz., flu, allergies, colds, cough; arthritis, rheumatoid arthritis, asthma; lucorrhoea, leukoderma, alopecia, hyperlipidaemia; heart diseases, blood pressure, renal disorders, hepatitis; dietary and gastrointestinal track disorders, acidity, ulcer; wound healing; skin infections/diseases, psoriasis, eczema; tuberculosis, chicken pox, leprosy and other bacterial/ viral infections; aging, chemical intoxication, worm infestations, obesity etc.; and deadly diseases like cancer, acquired immunodeficiency deficiency syndrome (AIDS) and diabetes.^{5,6}

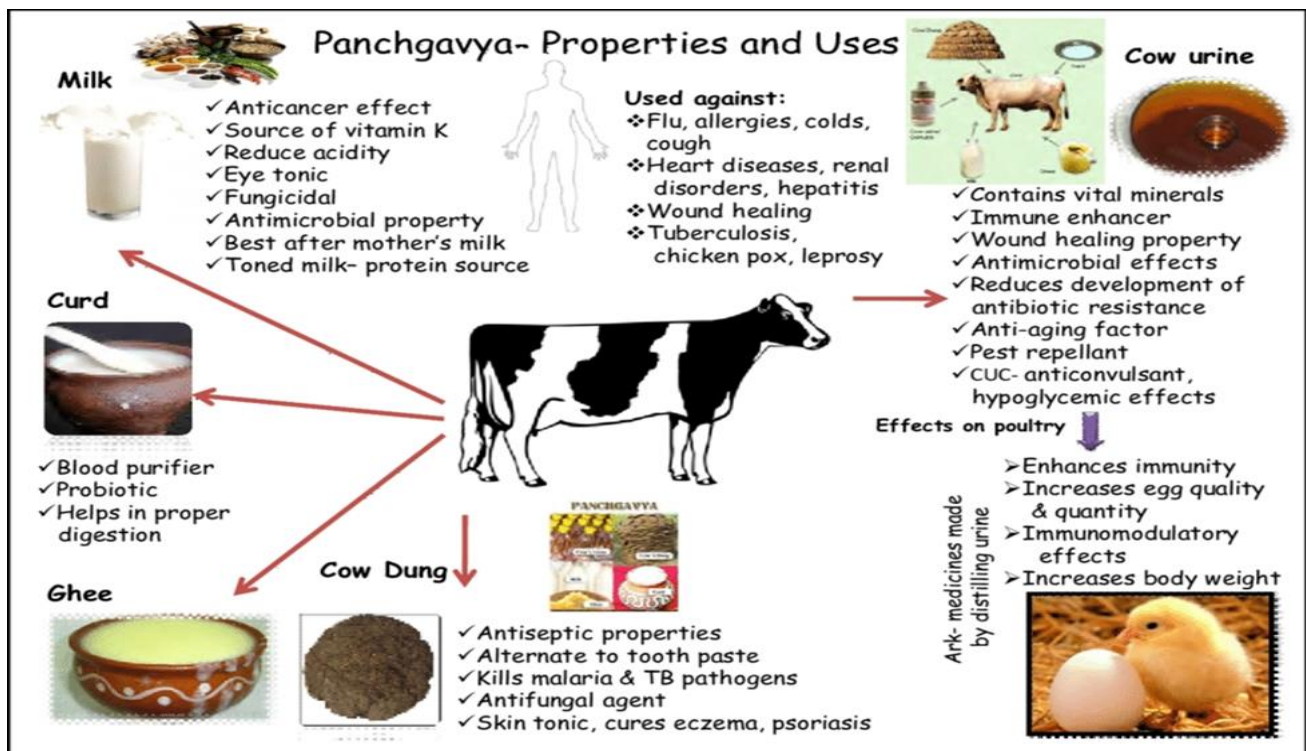


Figure 1: An overview of panchgavya therapy regarding immune-enhancing and therapeutic perspectives in safeguarding animal and human health

As immunomodulatory agents, panchgavya elements enhance both cellular and humoral immune responses, upregulates lymphocyte proliferation, secretion of cytokines and macrophage activity and lessen apoptosis in lymphocytes, consequently helping host to survive and fight infection. As antiaging agents, they prevent free radicals formation and efficiently repair the damaged DNA. Panchgavya can act as a promising source for simple and naturally derived bacteriological media that they are less expensive considering that they also provide additional antifungal properties and other properties that promote growth. Marked antifungal properties can act as a successful microbiological growth medium. Panchgavya, when used along with a plant like *Andrographis paniculata*, can act as an alternative to antibiotic growth promoter and enhance productivity of the broiler industry. Panchgavya have shown an ameliorative effect on certain viral diseases (e.g. New Castle disease in layer chicken). An overview of panchgavya therapy (cowpathy) regarding immune-enhancing and therapeutic perspectives in safeguarding animal and human health is presented in Figure 1.

Cow Urine

Cow urine acts as an integral component of Panchgavya in enhancing immune responses. Cow urine has multidisciplinary beneficial actions and it has been widely used in various fields of science. Corrosion of oil pipelines by formation of microbial biofilms has been a major problem in transmission of oil and petroleum products. Urine has anti-microbial properties and it has been used to control microbes thereby reducing the corrosion of pipelines.

Gomutra has capability of removing many ill effects and imbalances in the body. Cow urine helps in immune enhancement via cytokines (increases secretion of interleukin-1 and 2) and amino acids. It is shown to enhance both T and B cell proliferation and increase the levels of IgG, IgA and IgM antibody titres in mice. Cow urine augments the immune competence and helps to develop better general health and is considered as one of the most effectual secretions of animal origin (water of life or "Amrita"- beverages of immortality). It activates the macrophages and enhances both cellular as well as humoral immune responses. It hastens the process of wound healing due to external injuries, which is proved with excision wound model in Wistar albino rats. Antimicrobial effects are seen on a number of drug resistant bacteria and viruses. It is proved useful in untreatable diseases viz. cancer, AIDS, diabetes and skin problems. Cow urine is one of the best appetizers. Ark (distillate of cow urine) is a potent bioenhancer of commonly used antibiotic drugs, antifungal and anti-cancer drugs. Its use along with antibiotics help control bacterial infections; it acts as a bioenhancer of drugs in tuberculosis patients and helps in fighting against cancers [U.S. Patents granted to Council of Scientific and Industrial Research (CSIR), India for its beneficial medicinal properties.^{7,8}

Latest Research on Cow Urine

Cancer is the most dangerous disease cause to the human, which can be treated by following treatment modalities like chemotherapy, surgery, radiotherapy and immunotherapy along with new treatment modalities like recent molecular approaches of gene therapy, but the success rate is not very high and moreover, its well-known side effects cause to the patients to be treated. Alternate medicinal therapies have also been claimed to be helpful in the prevention and control of cancer. Cow urine therapy has also found that possess anti-cancer properties and for that US granted patent in the field of cancer treatment by its virtues of bioenhancing the activity of anti-cancer drugs. The cow urine therapy has tremendous potential in the field of medicine and has not been exploited to the extremes. Its now time to made public awareness about the important uses of cow urine therapy. Whatever may be the final result of treatment but scientific validation of those claims is required.

A study mentions the determinative role of cow urine distillate in helping the immunodeficient subjects in obtaining higher level of cell-mediated and humoral immune protection for better protection for overcoming different infections. Gomutra Ark is obtained from distillation process of the cow urine. Results from Gomutra Arka (cow urine distillate) and Cow urine are near about similar. it found that the chemical and medicinal properties of cow urine are preserved in Gomutra ark. There is very negligible content of ammonia in Gomutra ark of cow urine and it is easy to palatable and acceptable for patients. study found that cow urine distillate that is Gomutra Arka has antioxidant potential. Gomutra ark has also antioxidant and immunomodulatory effect.^{9,10}

Prevention of antibiotic resistance

There are various ways to developed resistant against antimicrobial drugs. Now a days the use of antibiotics has been increased tremendously. There are so many drugs which found ineffective against various bacteria and viruses. Vancomycin resistant *Enterococcus*, and ciprofloxacin resistance *P. aeruginosa* are some of the examples. Different study has been shown that CU (Cow Urine) is much effective against the drugs resistant bacteria and viruses. Minimum inhibitory concentration (MIC) values for Cow urine extract of *A. indica* was 12.68 mm (*E. Coli*), 9 mm (*K. pneumonia*) and along with this there is >8.66 mm zone of inhibition for MDR *S. aureus*, *P. aeruginosa* and *P. vulgaris*.

Antifungal

Various studies have found good antimicrobial activity of cow's urine comparable with standard drugs such as ofloxacin, cefpodoxime, and gentamicin, against a vast number of pathogenic bacteria, more so against Gram-positive than negative bacteria. Interestingly antimicrobial activity has also been found against some resistant strains such as multidrug-resistant (MDR) *Escherichia coli* and *Klebsiella pneumoniae*. Antimicrobial action is enhanced



still further by it being an immune-enhancer and bioenhancer of some antibiotic drugs. Antifungal activity was comparable to amphotericin B. Cow urine also has anthelmintic and antineoplastic action. It has, in addition, antioxidant properties, and it can prevent the damage to DNA caused by the environmental stress. In the management of infectious diseases, cow urine can be used alone or as an adjunctive to prevent the development of resistance and enhance the effect of standard antibiotics.^{11,12}

Antiseptic

Cow urine shows significant effect in wound healing activity in Wistar albino rats. Study found that CU urine heal wound faster 1% w/w nitrofurazone ointment locally.

Anthelmintic Activity

CUC was better than piperazine citrate as anthelmintic agent at both 1% and 5% concentrations.

Bioenhancer

A 'bioenhancer'/'biopotentiator' is substances that increase the bioavailability and bio-efficacy of active substance with which they are combined without having any activity of their own at the dose used. Ayurveda, has mentioned 'yogvahi' principle to describe the bioenhancing properties of medicines. It increases the oral bioavailability, results in lowering their dose and side effects. By integrating Ayurvedic science with modern methods of research, we can develop more viable drug formulations. CU which can be used as bioenhancer in antifungal, antimicrobial, and anticancer agents. In Ayurveda Rasayana medicine have properties to increase body immune system thus CU contains the similar Rasayana tatva and also serves as bioenhancer. CUD (Cow urine Distillate) is more effective bioenhancer than CU. CUD increase the transport of antibiotics by 2-7 folds like tetracycline, rifampicin, and ampicillin across the intestinal wall. It also enhances the potency of taxol against MCF-7 cell lines. It increases the bioavailability of rifampicin by 80-fold in 0.05 microgm/ml concentrations and clotrimazole by 5 fold in 0.88 µ g/ml concentration. The activity of rifampicin increases by about 5-7 folds against E. coli and 3-11 folds against Gram-positive bacteria, when used along with CU. Potency of paclitaxel has been observed to increase against MCF-7, a human breast cancer cell line in in-vitro assays. The bio-enhancing ability of CU is by providing the absorption of drugs across the cell membrane. US Patent is also granted for bioenhancer along with antibiotics, antifungal and anticancer activity (6896907,6410059) of CU.

Various properties and activity of CU has been applied and widely used in various ayurvedic formulations. Panchagavya ghrita, Lashunadghrita, Sidhartakghrita are used for psychiatric illness and abdominal tumor. Other formulations like Mandurvatak, Darvighrita, and Punnarvamandur also contains Cow Urine. CU is used as adjuvant along with Hareetakyadiyog, Swarnkshiryadyog, Swarnmakshikbhasma, Gvakshyadichurana and many other

formulations. Ghritas (Medicated cow Ghee) are also available as semisolid preparations while bhasms, yogs, and churans are in the powder form.¹³

Anticancer Properties:

CU has antioxidant properties and is a free radical and thus it neutralizes the oxidative stress. CU helps by repairing the damaged DNA and is therefore, effective as anti-cancer therapy.

Chemo preventive potential of CU was observed in a study, which was conducted on 70 Swiss albino mice for 16 weeks. Papilloma were induced by 7, 12 dimethyl benzanthracene and later promoted by repeated application of croton oil. In mice treated with CU, the incidence of tumor (papilloma), tumor yield, and its burden was statistically less than the untreated group 30 Effect of Cow Urine on various types of cancers was studied by Jain and his co-workers. Decrease in severity of various clinical symptoms (pain, inflammation, burning sensation, difficulty in swallowing, and irritation) was decreased from day 1 to day 8 with CU therapy. Percent of patients with severe symptoms decreased from 82.16 to 7.9 on day 8, patients with moderate symptoms increased from 15.8 to 55.3 and with mild symptoms, patients increased from 1.58 to 36.34. The severity of symptoms decreased further with continued CU therapy.^{14,15,16}

Immuno-stimulant

The use of herbs and minerals (like chavanprash and panchgavya) for improving the overall resistance of the body against common infections and pathogens has been a guiding principal of Ayurveda. Ancient Ayurvedic treatises say that consuming CU daily increases the resistance to diseases by up to 104%. This has also shown enhancement in humoral, and cell-mediated immune response in mice.

Wound healing activity of cow urine in DM induced rats:

Study demonstrated that cow urine ark significantly increases wound healing in diabetic wound patient. Thus, it helps in accelerating wound healing in diabetic patients because of its property of enhancing granulation tissue formation.¹⁷

Anti-urolithiatic effect of cow urine

Cow urine ark showed significant effect against renal calculi and restoration of compromised renal function. This type of action of CU might be due to it reduce excretion of calcium oxalate and inhibit process of crystallization. Further experimental studies are needed to know its mechanism of action.¹⁸

Antioxidant

Cow urine tested for antioxidant and antimicrobial activities and it exhibited the mentioned activities. The revealed antioxidant property of cow urine its distillate may provide potential therapeutic intervention against oxidative threats, both in health and disease. The result suggests that the antioxidant action is attributed to the free radical



scavenging activity of the urine components and these components may prevent the process of aging.¹⁹

Chemical composition of cow urine:

Water – 95%

Urea – 2.5%

Minerals, Salts, Hormones, Enzymes – 2.5%

Healthy cow urine has volume of 17-45 ml/Kg/day with specific gravity ranging from 1.025- 1.045. Its pH ranges between 7.4 to 8.4 with seasonal variations. Urea nitrogen and Total nitrogen varies between 23-28 ml/kg/day and 40-45 ml/kg/day respectively. Other important constituents are given in table below.²⁰

Table 1: Chemical constituents of healthy cow urine and it's effects on human body

Substance present in Cow Urine	Positive effects on the human body
Ammonia; NH ₃	Helps in stabilizing the three properties: bile, mucous and air of body. Also improves blood formation.
Aurum Hydroxide; AuOH	It has a germicidal nature; AuOH is also antibiotic and anti-toxic, thus increases immunity power of the body.
Calcium; Ca	Imparts basic strength to bones, and has also germicidal power with blood purification improvement.
Carbolic acid;	HCOOH It has a germicidal nature, preventing the growth of germs and is also able to prevent gangrene.
Copper; Cu	Improves the absorption power of magnetic rays and also controls build-up of excessive fats.
Creatinine; C ₄ H ₉ N ₂ O ₂	Improves action against germs.
Enzymes	Improves digestion and increases immunity.
Hipuric acid; C ₉ H ₉ N ₃ O ₃	Helps in the removal of toxins through urine.
Iron; Fe	Maintains balance and helps in production of red blood cells & haemoglobin.
Lactose; C ₆ H ₁₂ O ₆	Helps in strengthening the heart; decreases nervousness.
Manganese; Mn	It imparts better germicidal power. Avoids decay leading to gangrene as it stops growth of germs.
Nitrogen; N ₂ , NH ₂	Prevents abnormalities in blood and prevents the effect of toxins, its diuretic nature makes it to be a natural stimulant of urinary track, and activates the kidneys.
Phosphate; P	Helps in preventing urinary tract stone formation.
Potassium; K	Cures hereditary rheumatism. Increases appetite. Removes muscular weakness and laziness.
Sodium; Na	It helps in purification of blood as NaCl decreases the acidic content of blood; also has an antacid nature.
Sulphur; S	Improves bowel action of the intestines. Cleanses blood.
Urea; CO(NH ₂) ₂	Improves urine formation and exhalation action. Also has a germicidal action
Uric Acid; C ₅ H ₄ N ₄ O ₃	Prevents the swelling of heart inflammation. It is diuretic therefore destroys toxins.
Vitamins A,B,C,D,E	Vitamin B is active ingredient for energetic life and prevents the effects of nervousness and thirst. It also helps in boosting the bone strength and reproductive power of the individual.
Water; H ₂ O	It maintains fluidity of blood, and helps in controlling the body temperature.
Other Minerals	Help in boosting immunity power of the body.

Urea is a Strong Antimicrobial Agent and it is end protein metabolism, while uric acid has antimicrobial activity and it helps to control infections. Copper in healthy cow urine controls fat deposition, Iron is responsible for producing

RBC while sodium and potassium plays major role as body electrolyte. Other important ingredients with their functions are as follows:



1. Creatinine - it acts as an Antibacterial
2. Aurum hydroxide - Antibacterial, improves immunity, acts as antidote
3. Enzymeurokinase - It is responsible for dissolving the blood clot, improvement of heart disease, blood circulation
4. Colony Stimulating factor - Effective for cell division & multiplication
5. Erythropoietin stimulating factor is major stimulating factor for production of Red blood cells.
6. Gonadotropin - Promotes menstrual cycle, sperm production
7. Anticancer substances- Prevents multiplication of carcinogenic cells.

Enzymes

1. Lactate-Dehydrogenas - 21.780 unit |lt
2. Alkaline Phosphotase - 110.110 KA Unit
3. Acid Phosphotase - 456.620 XA unit
4. Amylase - 90.236 unit
5. Vit-C - 216.408mg|lt
6. Vit-B1 - 444.125 microgram|lt
7. Vit-B2 - 0.6339mg|lt
8. Protein - 0.1037gm|lt
9. Uric Acid - 135.028mg|lt
10. Creatinine - 0.9970 g|lt
11. Lactate - 3.7830 milimole|lt
12. Phenol - 4.7580mg|100ml
13. Free volatile phenol - 0.7130mg|100ml
14. Compound volatile phenol - 1.3420mg|100ml
15. Aromatic hydroxy acid - 2.7030mg|100ml
16. Calcium - 5.735 milimol|lt
17. Phosphorous - 0.4805milimol|lt

Cow Milk

Cow milk serves a vital role in meeting needs of most essential nutrients. It is a rich source of micronutrients, protein, calcium and vitamins, contains carotenes, vitamins A, B complex group and C. It has low calorific value and low cholesterol. It is one of the best vitalisers for human health. It plays a bioprotective role in human health and is easily digestible. It is effective in curing fever and pain, tumours, and diabetes. It is a suitable medium for administering medicines and has fungicidal properties. Cow milk has been useful in kidney disorders due to its low protein content. Its antimicrobial effects are due to immunoglobulins (IgA), lactoferrin, lysozyme, lactoperoxidase and vitamin B12-binding protein. Lactoferrin B shows marked antifungal

activity. "Carotene" (Vitamin A) in cow milk is good for eyesight. It allows better absorption of nutrients. It helps in reducing acidity, and thus reduces chances of peptic ulcer. Cow milk is best for infant feeding after mother's milk and a good supplement food for adults. It is a very good blend of all the nutrients necessary for body development of young ones. Cow's milk is a rich source of vitamin K which prevents hemorrhagic disease of newborn, as folic acid present in the milk protects against anaemia.^{21,22}

Cow milk has anti-aging properties. It has also got fungicidal properties against powdery mildew (*Sphaerotheca fuliginea*) and can be used as a fungicidal. It is a rich source of vitamins like B2, B3 and vitamin A and Zinc, and helps in increasing immunity. Cow milk is a tonic for health, is energy providing, and is good for heart and brain. It has lesser fat content as compared to that of buffalo milk, thus decreases risk of coronary heart diseases and checks obesity. It is good for diabetic patients. As natural antioxidant, it neutralises oxidative stress. Cream or ghee from cow's milk renders the skin fair and smooth. Cow milk and its products were shown to have antidiabetic activity but the exact mechanism has not been elucidated. Whey proteins reduce blood pressure which will increase the health of people.^{23,24}

The milk of a red or black cow fed on Arjuna (*Terminalia arjuna*), Mash (*Phaseolus mungo* Linn.) leaves or beans or on Ikshu (*Saccarum officinarum* Linn.) can act as rejuvenator and aphrodisiac agent. It is being used as an essential part of "Panchamrit". The fat component of cow milk is a potential anticancer agent. It reduces risk of colon, breast and skin cancer. Conjugated linoleic acid prevents uncontrolled spread of cancer-affected cells. Skimmed milk powder of cow's milk with added vitamin A, D and pyridoxine could serve as an economical food having good nutritive value. Toned milk is a valuable source of proteins for malnourished children and pregnant women. Other products are Khoa (Mava) Chhana (cottage cheese), Yoghurt, Lassi (Butter milk) and Ghee (Clarified butter: Butter-fat). It was observed that dieters who got dairy products lost 70% more weight than those avoiding it.^{25,26}

Cow Curd (Dahi)

It is considered as "Vatanashak", blood purifier, "Tridoshnashak" and found useful in "Pitta", blood related problems, piles and gastrointestinal disorders. It is one of the most wholesome of all food items. As an efficient probiotic, it helps control infections in a non-drug manner. Cow curd (Dahi) or Matha (whey or butter milk) is a reliable digestive, nutritive and useful in gastrointestinal ailments as it helps to check or control growth of harmful microorganisms. Lactic acid producing bacteria produces antifungal metabolites (cyclic dipeptides, phenyllactic acid) as well as proteinaceous compounds and 3-hydroxylated fatty acid. Curd has been used either with sugar or with black salt and zira. For animal health also, the whey with salts is given to neonatal calves to treat diarrhoea and intestinal parasitism. In milched buffaloes, it enhances



production. Concentrated whey increases draught power in bullocks.²⁷

Cow Ghee

Cow ghee improves memory, voice, vision, intelligence and body's resistance to infections. It enhances physical and mental health, keeps muscles and tendons healthy. It is a good blood purifier, antiageing agent, and is also good for cholesterol and heart patients. It helps in preventing and controlling paralysis and asthma. It has got immunostimulant potential: it increase neutrophil adhesion, haemagglutination (HA) titre and is helpful in delayed type hypersensitivity (DTH). Cow ghee in combination with certain selected herbals can cure skin diseases and facilitate healing of wounds when used in combination with honey. Panchagavya Ayurvedic formulation with *E. officinalis*, *G. glabra*, and cow's ghee may be used as sedative. Panchagavya ghrita also shows hepatoprotective activity in rats against carbon tetra chloride.^{28,29}

Cow Dung

Cow dung possesses antiseptic, antibacterial and antifungal properties and acts as skin tonic, and is useful in psoriasis, eczema and gangrene. Mixture prepared with crushed neem leaves is good for boils and heat rashes on skin. It is a good alternate for chemical toothpastes. It destroys microorganisms that cause disease, fermentation and putrefaction. Fresh cow dung is found to kill the germs of Malaria and T.B. Antifungal substance inhibits growth of Corprophilous fungi. Eupenicillium, bovimosum present in cow dung produces Patulodin-like compounds (CK2108A & CK2801B) that boost antifungal activity. It can act as a relevant model ecosystem for studying fate of drugs. Isolation of two basidiomycetes (strain NRRL6464 & *Cyathus stercoreus*) has raised possibility of degrading lignocellulose and in addition *C. stercoreus* can degrade drug like enrofloxacin (Wicklow, 1992). It is found to be useful for bioremediation of various pesticides because of the presence of higher concentration of nutrients and larger microbial population; thus, harmful effects (immunosuppression, autoimmunity and hypersensitivity reactions) of biopesticides on animal as well as human health could be avoided.

Smoke from ashes results in a lot of tears from the eyes which improves vision. Fresh cow dung is pure but once it has been laid on the ground awhile, it changes. Cow dung-based ecofriendly mosquito repellents have been developed recently. Pesticides exert their harmful effect by causing immunosuppression, autoimmunity and hypersensitivity reaction. The use of cow dung for bioremediation of various pesticides is found to be effective.^{30,31}

CONCLUSION

Panchgavya is positively an encouraging solution for various ailments/diseases of humans and animals with immense biomedical applications along with other beneficial usages.

Its usage would further expand through scientific validation and research supports, clinical trials, commercialisation, and popularity in the society and the public. The ancient scriptures of ayurveda consider cow urine to be the elixir of life. It is the most effective natural remedy and the safest method of treatment bestowed upon us by nature. However, there is still a need not only to explore further research possibilities but also to stop cow sacrifice across the world. she is a very sacred and holy animal so to worship as God. Cow urine and its distillate in various research articles it concludes that cow urine is a really multidimensional drug. As it is anticancerous, antimicrobial, anti-diabetic, anti-urolithiatic, antipsychotic drug and also enhances the immunity of animals and humans. Ayurveda already told that fresh cow urine of indigenous cow is the best.

In future, it can be given as an ideal immunomodulator (biovaccine) to protect man and animals from various diseases. Various formulations can be prepared in the form of capsules in order to make it palatable and more acceptable in society which can also protect the population from the dangerous corona virus infection.

Nowadays resistance to antibiotics is a major concern to world but as a bioenhancer cow urine distillate is found very effective to overcome such kind of issues.

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