

Panchgavya: Importance for Health and Agriculture

Shailesh Kumar Gupta¹, Kuladip Prakash Shinde¹, Suchit Kumar² and Shimla Gupta³

¹Livestock Production and Management Division, National Dairy Research Institute, Karnal, Haryana-132001

²Animal Genetics and Breeding Division, National Dairy Research Institute, Karnal, Haryana-132001

³Department of Agricultural Entomology, Indira Gandhi Krishi Vishwavidyalaya, Raipur, Chhattisgarh-492012

In our country cow is called as a mother. In veda, cow is considered as a 'Kamdhenu'. It means that cow fulfilled our all wishes. In our country the importance of cow is for health, agriculture, environment, economic and ritual. We use important products of cow is Milk, urine, dung, Ghee and curd. These are simultaneously called as Panchgavya. We produce many ayurvedic products and preparation from panchgavya which has health promoting effects. Different types of sweets and food items are prepared from milk. In ancient era, Panchgavya was also used for treatment of many diseases. Importance of Cow urine was written in Atharva Veda, Charak Samhita and many holy books. Nation's social and economical development is based on the Livestock. In a developing country like India, to maintain the essential diet requirement, cow product is a good source of nutrition.

Panchgavya is used for Asthma, cancer, skin diseases, diabetes, aids, Jaundice, Anemia, Arthritis, kidney diseases and many diseases of respiratory and digestive system. Panchgavya has disinfectant and antiseptic property. Panchgavya is used in agriculture in the form of vermicompost, biopesticides and biofertilizers.

Livestock plays important role in livelihood of Indian people. In our country marginal and small farmers get employment through Animal husbandry. In livestock farmers category, woman, children, girls and old persons also engaged. In rural areas woman involvement in animal husbandry practices is about 70%. The population of Indian livestock increasing continuously. According to 19th Livestock census total livestock population in our country 512.05 million (Livestock census, 2012). Total contribution of livestock sector in Agriculture and National economy is about 25.6% and 4.5%. Important Indian breeds of India are Sahiwal, Tharparkar, Gir, Red Sindhi and Rathi. Some dual purpose breeds, Haryana, Dangi, Krishna Valley, Deoni and Kankrej etc. also very important. In the year 2012, cattle population increased to 190.9 million. The number of milking animals increasing continuously in country so total milk production increased very fast in last some years which was only 17 millions in 1950-1951.

The share of indigenous cows in milk production is about 21% whereas productivity is about 2.3 kg/day/animal. In India, productivity of Indigenous animals is less than exotic animals due to low availability of good quality feed and fodder, poor management and lack of new technologies related to animal husbandry. However, milk and the cow products are popular in India. Bulls are mainly used for agriculture practices and transportation. Cow is used for milk and other different panchgavya practices. The important features of Indian cow as follows-

1. Presence of hump and flap at neck is main physical characteristics of Indian cow.
2. Indian cow is more resistant to climate condition than exotic. We can rear indigenous animal in all over. Very less effect of climate change was observed in these animals. Exotic cow suffered by different diseases due to climatic problems. Immunity to the diseases is more in Indigenous cow than exotic. No any special type of feeding practices is required in Indigenous animals. Common fodder, grasses, cakes can be used for feeding.
3. Calf management practices also easy in Indigenous animals whereas in exotic animals calf mortality is a big problem related to management.
4. The milk of Indian cow is more nutritious and contains all essential minerals and vitamins for healthy life. No special housing and management practices are required for Indigenous cow. We can rear animals in a common type house, founded in rural India. The investment related to house construction is very less.
5. Cow urine, dung and farm waste is used for agriculture practice. The qualitative compost making is possible by animal waste. The land health can be maintained by beneficial microbes, which comes from good quality compost. There is no any adverse effect on soil and environment by using animal excreta. An organic farming practice is a demand of present scenario.

Cow milk

Cow milk is a good source of all types of nutrients. The quality of milk can be judge by its compositional parameters like fat percent, SNF percent etc. It depends on breed, age of animal and feed composition. Cow milk contains about 86% water, 4.65% fat, 3.4% protein, 4.6% lactose and 0.54% minerals. Milk is a good source of Ca and Phosphorous and essential fatty acids. Milk protein has 36% α -Casein, 27% β -Casein, 9% κ -casein and 27% peptides. Casin protein found in the form of colloidal state. Casin percentage in cow milk is about 3%. Milk also contains phospholipids like, lecithin, cephalin, sphingomylin and pigments like carotene, riboflavin and xanthophyll etc. Milk of cow is used for preparation of different dairy products as Cheese, Khoa (Mava), Yoghurt, Lassi (Butter milk), Kulfi, Khoya, Rabri, Kheer, Srikhand, Basundi, Condensed milk, powdered milk, toned milk, double toned milk etc. In many previous study it was found that cow milk contained higher level of fat, protein as compare to exotic animals.

Cow milk contains low cholesterol. It is important for physical and mental development. Milk is also important for bone growth, teeth growth, heart activity and all body function. Cow milk is used in the place of mother's milk for infant feeding. Anemia problem of infants can also reduce by cow milk. Cow milk contains Vitamin A is important for vision. It helps in healing of peptic ulcer. Vitamin A₁, B₁ and B₂ of milk helps to increase immune system of body. Cow milk destroys harmful digestive system microbes and promotes beneficial bacteria. Cow milk is also used as a fungicidal in human and animals (Bettioli *et al.*, 1999). Cow milk contains lactose sugar which is a important source of energy. Milk is important for all age group people viz. infant, adults and old person.

Indian cow produces A₂ milk which has health benefits. A₁ milk is produced by cross and exotic breeds. A₁ milk causes diabetes, heart disease, cardiovascular diseases, asthma, allergy and many human health disorders. In this health point of view Indian deshi cow is a god gift for people. Vitamin K of milk helps in blood clotting and it also reduces blood excretion related problems.

Cow urine

Cow urine is a main part of panchgavya. The importance of cow urine is discussed in all Ayurveda books. Cow urine is considered best in all species. A person may healthy and active by daily intake of cow urine. Cow urine contains 95% H₂O, 2.5% urea; minerals and salt; 2.5% hormones and enzymes (Bhadauria, 2002). It also contains different organic and in-organic substances, nitrogen, lactose, uric acid creatinin, citric, succinic, calcium salts, hormones, carbolic acid, Mn, Mg, Sulpher phosphate and vitamins like A,B,C, D.

It contains about 24 types of acidic elements. It also contains. The concentration of Nitrogen depends upon the feeding quality. The quality of cow urine is better in grazing animals as compare to stall fed as grazing animals gets different essential elements from grazing field. Cow urine is used as natural condition or after different treatment. photoactivated cow urine worked as a potential antimicrobial agent against both Gram-positive and Gram-negative like, *Salmonella typhimurium*, *Enterobacter aerogenes*, *Staphylococcus aureus*, *Bacillus cereus*, *Aeromonas hydrophila*, *Micrococcus luteus* etc (Sarsar *et al.*, 2013). Cow urine arc can be obtained after distillation. It can be stored for future use as it contains very less amount of Amonia.

1. Cow urine is used for treatment of many diseases like aids, asthma, epilepsy, diabetes, heart stroke, joint pain, constipation, edema, stomach diseases, liver diseases, filarial and many reproductive disorders. It is also used for treatment of cancer and leprosy. In animal husbandry practices cattle urine is used as a biostimulant for early puberty in cows.
2. Cow urine is used for anticancer medication Uncontrolled use of pesticides in agriculture causes apoptosis of lymphocytes and tissue. In a developing country like India, use of pesticides in Agriculture is a big problem. Ambwani, (2004) reported that use of distilled cow urine avoid this process and repairs damaged DNA.
3. Cow urine is used for preparation of anti diabetic drugs. Sachdev *et al.*, (2012) studied the effect of Gomutra ark on alloxan-induced diabetes rats and found that cow urine have high therapeutic index and significant anti-diabetic effect due to its antioxidant activity.
4. Cow urine mixed with ginger is a medicine for cough and respiratory diseases.
5. In modern urbanization and global warming condition, disease resistance of microbes is a big problem and a bacterium becomes resistance to antibiotics and other anti microbial agent. In these conditions, cow urine preparations are a hope for disease treatment. Cow urine works against all type of Gram positive and Negative bacteria.
6. In India farmers are small and marginal type. The agriculture field reduces very fast so demand of productive land increased. In these conditions, we should work for more crop production in a fixed area. So cow urine is a best option for manure preparation.
7. Cow urine application maintains soil productivity and worked against different insects. Gupta and Yadav (2006) reported about cow urine efficacy against stem borers than conventional insecticide and biopesticide. Reduced insects population was observed due to application of cow urine. They also found highest cost benefit ratio in cow urine sprayed soybean crop. Patel *et al.*, (2017) found that

combination of cow urine fortified at 20% + neem leaf extract 10%, jatropha leaf extract 10% and custard apple leaf extract 10% resulted in high yield and suppression of fruit borer, sucking pests and shoot. Aswal *et al.*, (2010) reported a combination of 20% *Datura alba* and 20% cow urine is effective against stem borer and leaf folder in production of rice.

8. In poultry industry, cow urine is used for enhancing better quality egg production and immunity development (Garg *et al.*, 2004). Cow urine also helps in body growth and development of bone. Garg *et al.* (2005) reported that use of distilled cow urine 1 ml per bird with basal diet resulted in increased body weight of leghorn layers as compared to Control birds.
9. Cow urine helps in removal of waste materials from body. It is used for melting of kidney and stomach stone.
10. Cow urine worked as a antidote of different for poisons. Jain *et al.*, (2010) found that Aurum hydroxide and copper of Cow urine act as a antidote of different poisons.
11. Cow urine is used to reduce fungal activity. It can be used for *Rhizobacterium*, *sclerobacterium*, *Fusarium*, *Colletotrichum*, *Aspergillus*, *Tropicals*, globtata etc.
12. Cow urine has strong antioxidant activity due to presence of different volatile fatty acids. Antioxidants are those product reduces the body loss of oxidation activity in the body. Vitamin C, E and carotene are mainly present in the fruits but cow urine is also a good source of antioxidant. It reduces the toxic elements of body. It removes the damaged DNA of human body. Cow urine is also important to maintain the immunity in the body. It enhances activity of macrophages, lymphocytes and Interlukines.
13. In villages cow urine is used for floor and wall painting for destroy microbes. In some parts of India cow urine is used for footbath in front of house and animals shed. Different cow urine products like body lotion, drinks and shampoo are available in markets.

Cow dung

Cow dung is called Gomaya. Cow dung has many beneficial microbes and also contains many nutritional elements. When feed passes through different parts of digestive system it absorbs minerals, vitamins and tract excretions. It also contains C, N₂, K, O₂, Phosphorous, mucus, cellulose, Hemi cellulose and Lignin, bacillus, *Lactobacillus*, *streptococcus*, *cocci*, *Saccharomyces* and *Candida* etc. Deshi cow dung contains more nutrients than exotic cows. Cow dung can be use for environment safety, degradation of city and hospital waste because it contains a large variety of microorganism. Use of cow dung in at appropriate concentration cause biodegradation of motor oil mixed water (Umanu *et al.*, 2013).

To maintain the soil quality it is essential to regular use of organic materials, cattle dung and animal excreta. it also help to maintain earthworm population in the soil. Earth worm maintains biological activity of soil and maintain fertility. Hand *et al.*, (1988) reported that use of cow dung with earthworm species *E. andrei* causes enhancement of nitrofication process. Fungal diseases is a major problem in agriculture. Cow dung inhibits the fungus growth like *F. oxysporum*, *Sclerotinia sclerotiorum* and *Fusarium solani* (Basak and Lee, 2002). Cow dung is used in organic agriculture farming. Organic farming is a natural agriculture practice where use of pesticides, fertilizers, weedicides, pesticides and antibiotics is avoided. These preparation causes health hazard in both human and animals. Today organic products through agriculture and livestock gaining demand. Use of cow based manure in agriculture will help in achievement of this demand. Bio gas is a important source of energy which is produced from use of cow dung, urine and animal excreta. Bio gas has 60-65% methane and calorific value is about 4500 kcal.

In village area cow dung cake is used for food making as a source of energy. It causes destroy of many air microbes, refreshes environment and reduces our other energy source dependency. During home construction cow dung is used for wall painting. Fibers of dung are used for paper making. Cow dung with Neem tree leaves is used for treatment of skin diseases and skin softness. Cow dung powder is used for absorption of toxic materials.

Dahi

Dahi (curd) is also called as Yoghurt made by fermentation of milk. It is an important part of *Panchamrita* in Hindu ritual ceremony. It contains about 85% water and 3.4% protein. It is used for direct consumption, preparation of srikhand and makkhan etc. It also contains vitamin A, D, E, zinc, and phosphorus, B-12, calcium and magnesium. Important microorganism involved in Dahi preparations are *Streptococcus*, *acidophilus* and *lactobacillus* etc. It is used as energy booster. It maintains digestion system and worked for defence mechanism of the body. Dahi is anti-fungal in nature so it is used for hair conditioner.

Dahi is a good source of probiotics. Probiotics maintain health and boost immune system. Probiotic are live microorganism that act beneficially in the host when administered orally. Vitamins B, C, E, proteins and minerals which are present in the dahi helps in management of HIV (Irvine *et al.*, 2010). Dahi also helps in treatment of diabetes. Dahi consumption caused decrease of total cholesterol and LDL-C upto 4.5% and 7.5% in comparison to control group. Obesity is a big problem in our country and it is the reason of many diseases. Use of Dahi as food item for 3 month causes reduction of abdominal fat and body weight (Kadooka *et al.*, 2010).

Calf health is a very critical factor affecting dairy industry. In a study it was found that revealed calf diarrhoea, pneumonia

and pneumoenteritis are the main cause of calf mortality (Panchasara *et al.*, 2011). It is due to lack of feeding standard, low immunity level, high levels of stress, change in environment and lack of management practices. Use of probiotic, prebiotics and combination of probiotic and prebiotic (synbiotics) for calves helps to reduce mortality problems. It improves gastrointestinal health and immune function. Use of probiotics in animals diet helps in growth performance, weight gain nutrient digestibility, trigger an immune response and stress reduction. Ohya *et al.*, (2000) calves had stop detectable fecal shedding of *E.coli* by the 14th day at the initial of probiotic diet, and fecal pH maintain around 6 to 7. Frizzo *et al.*, (2011) studied effect of probiotic on growth performance and they observed that on supplementation of lactic acid producing bacteria, there was increase in body weight gain and feed efficiency also improved. It was happened because rumen environment was helpful for digestion activity.

Ghee

Ghee is a by product of milk obtained after processing of milk and milk products. Ghee is prepared by heating of butter at higher temperature till loss of all moisture. It contained higher amount of fat Omega 3, and Omega 9, essential fatty, vitamin A, vitamin D, and vitamin E, vitamin K and 99.5g fat/100g. It contains short chain fatty acid helpful for health. Ghee obtained from deshi cow is better than exotic animals. It health health benefits as promotes healing of inflammation, anti-cancer, eliminate free radicals from body, eye protection, skin fairness. Ghee manages digestion process in the body and generate energy for body. Ghee play important role in reducing cholesterol in body. Generally people preferred ghee for weight gain Herbal preparation with cow ghee prevents skin diseases and causes very fast wound healing with honey (Kaur *et al.*, 2001). Cow urine improves heart health as reduces Ca deposition in heart chambers, arteries and veins. Ghee promoted the immunity system of body as it contains butyric acid. Ghee is an important part of our food cooking practices.

REFERENCES

- [1] 19th Livestock Census (2012) All India Report. Ministry of Agriculture Department of Animal Husbandry, Dairying and Fisheries, Krishi Bhawan, New Delhi.
- [2] Ambwani S. (2004). Molecular studies on apoptosis in avian lymphocytes induced by pesticides. PhD thesis, GBPUA&T, Pantnagar, India.
- [3] Aswal, J. S., Kumar, J., and Shah, B. (2010). Evaluation of biopesticides and plant products against rice stem borer and leaf folder. *Journal of Eco-friendly Agriculture*. 5(1): 59-61.
- [4] Basak, A. B. and Lee, M. W. (2002) In vitro inhibitory activity of cow urine and cow dung of *Fusarium solani* f. sp. *Cucurbitae*. *Microbiology* 30: 51-54.
- [5] Bettiol, W., Astiarraga, B. D. and Luiz, A. J. B. (1999). Effectiveness of cow's milk against zucchini squash powdery mildew (*Sphaerotheca fuliginea*) in greenhouse conditions. *Crop Protection*, 18 (8): 489-492.
- [6] Bhadauria, H. (2002). Gomutra-ek chamatkari aushadhi (cow urine – a magical therapy). *Vishwa Ayurveda Patrika*. 5: 71-74.
- [7] Farvin, K. H. S., Barob, C. P., Nielsen, N. S., Otte, J. and Jacobsen, C., Antioxidant activity of yoghurt peptides: part 2nd characteristics of peptide fractions. *Food Chemistry*. 123:1090-1097.
- [8] Frizzo, L. S., Zbrun, M. V. Soto, L. P. and Signorini, M. L. (2011) Effect of probiotic on growth performance in young calves: Ameta-analysis of randomized controlled trials. *Ani. Feed Sci. and Tech*. 169: 147-156.
- [9] Garg, N., Ashok, K. and Chauhan, R. S. (2005). Effect of indigeneous cow urine on nutrient utilization of white leghorn. *International Journal of cow science*. 1: 36-38.
- [10] Garg, N., Kumar, A., Chauhan, R. S., Sinhgal, L. K. and Lohani, M. (2004) Effect of cow urine on the production and quality traits of eggs in layers. *The Indian Cow*. 1:12-15.
- [11] Gupta, G. and Yadav, S. R. (2006). Cow urine efficacy against stem borers and cost benefits in soybean production. *International Journal of cow science*. 2(2): 15-17.
- [12] Hand, P., Hayes, W. A., Frankland, J. C. and Satchell, J. E. (1988) Vermicomposting of cow slurry. *Pedobiologia*. 31: 199–209.
- [13] Irvine, S. L., Hummelen, R., Hekamat, S., Looman, C. W., Habbema, J. D. and Reid, G. (2010) Probiotic yoghurt consumptins is associated with increase of CD₄ count among people living with HIV/AIDS. *Journal of Gastrointestinal*. 44:201-205.
- [14] Jain, N. K., Gupta, V.B., Garg, R. and Silawat, N. (2010) Efficacy of cow urine therapy on various cancer patients in Mandsaur District, India - A survey. *International Journal of Green Pharmacology*. 4: 29-35.
- [15] Kadooka, Y., Sato, M., Imaizumi, K., Ogawa, A., Ikuyama, K. and Akai, Y. (2010) Regulation of abdominal adiposity by probiotics (*Lactobacillus gasserii* SBT2055) in adults with obese tendencies in a randomized controlled trial. *European Journal of Clinical Nutrition*. 64(6): 636–643.
- [16] Kaur, S., Dayal, R., Varshney, V. K. and Bartley, J. P. (2001) GC-MS analysis of essential oils of heartwood and resin of *Shorea Robusta*. *Planta Medica*, 67: 883–886.
- [17] Ohya, T., Marubashi, T. and Hiroya, I. T. O. (2000) Significance of volatile fatty acid in shedding of *E.coli* 0157 from calves: Experimental infection and preliminary use of a probiotic product. *Journal of Veterinary Medicine Science*. 1151-1155.
- [18] Panchasara, H.H., Sutaria, T.V., Shah, R.R. 2011. Factors affecting mortality in Mehsana buffalo calves. *Intas Polivet*.10: 170-173.
- [19] Patel, N. B., Korat, D. M. and Acharya, R. R. (2017) Impact Evaluation of Cow-Urine and Vermiwash on Insect Pests of Brinjal. *International Journal of Tropical Agriculture*. 35:3.
- [20] Sachdev, D. O., Gosavi, D. D., and Salwe, K. J. (2012). Evaluation of antidiabetic, antioxidant effect and safety profile of gomutra ark in Wistar albino rats. *Ancient Science of Life*. 31(3): 84–89. <http://doi.org/10.4103/0257-7941.103180>.
- [21] Sarsar, V., Selwal, K. K., Selwal, M. K., Pannu, R, Tyagi, P. K. (2013) **Evaluation of antibacterial activity of photoactivated cow urine against human pathogenic strains.** *Environmental and Experimental Biology* 11: 201–203.
- [22] Umanu, G., Nwachukwu, S. C. U and Olosode, O. K. (2013) Effects of cow dung on microbial degradation of motor oil in lagoon water. *GJBB* 2:542–548.