II. REVIEW OF LITERATURE

Indian cow is known as “Kamadhenu” which means the giver of all or providing riches to humanity and “Gomata” because of its nourishing nature like mother and is said to be a store house of nutrients and medicines. Indian cow breeds are very unique and distinct species both in their appearance and characteristics.

The indigenous cattle, scientifically called as *Bos indicus* or *Zebu* cattle, mainly inhabit the Indian subcontinent. It is thought to be world’s oldest domesticated cattle. Also, historically it is proved by the fact that humped cattle remains were found in Mohanjodaro site of Indus Valley indicating their presence in India even before the arrival of Aryans. Presently cow rearing is an important source of income and an enterprise, which enables poor and landless farmers to earn income using common property resources and land (Chauhan, 2007).

2.1 Deoni cow

2.1.1 Origin

The Deoni breed of cattle also sometimes known as Dongari (which means "of the hills") has been evolved within the last 200 years. It is said to develop from a strain descended from the mixture of Gir, Dangi and local cattle. A contribution from the Gir type of cattle is quite evident in the formation of the head and ears, and also of the horns to a certain extent. They also show a great similarity in general conformation and ruggedness to the Dangi cattle of Bombay State, an area which is not far from the Deoni cattle breeding area (Joshi and Phillips, 1953).
2.1.2 Location

The Deoni breed is mainly distributed in the areas of Latur, Parbhani, Nanded and Osmanabad districts of Maharashtra, and Bidar district of Karnataka (Joshi and Phillips, 1953).

2.1.3 Characteristics

Deoni is a medium-sized animal which resembles the Gir in physical structure to a large extent. The body color is usually spotted black and white, sometimes complete white. The face is also similarly patchy and spotted with black and white. The forehead is convex and bulging; though breeders have not paid the same scrupulous attention to this trait as the breeders of Gir cattle, and though the ears are long and open forward they lack the leaflike structure and also the notch at the tip of the ear that is typical of the Gir. The horns in typical animals take a characteristic outward and backward curve similar to that generally to be seen in Gir cattle. The skin is loose and of medium thickness. The dewlap is heavy and the sheath is usually pendulous. The hair is soft and short. The cows have a fairly well-developed udder. The body is massive and upstanding with considerable depth. The hooves are well-made and shapely and of a black color (Plate 1). The body structure gives appearance of strength (Joshi and Phillips, 1953).

2.2 Cowpathy/ Panchgavya

Panchgavya is a term used to describe five major substances, obtained from cow, which include urine (Gaumutra), dung (Gaumaya), milk (Gaudugdh), butter oil (Ghee) and curd (Gaudahi). All the five products possess medicinal properties against many disorders and are used for the medicinal purpose singly or in combination with some other herbs. This kind of treatment is called as Panchgavya therapy or
cowpathy. It is a system of medicine just like homeopathy, allopathy or naturopathy. Cow urine has been described in ‘Sushrita Samhita’, ‘Charaka Samhita’ and ‘Ashtanga Sangraha’ as a most effective substance/secretion of animal origin with innumerable therapeutic values (Charaka Samhita 1981; Sushrita Samhita, 1985; Tietze, 1996).

The *Panchgavya* products also show many other applications, viz. in agricultural operations in the form of excellent biofertilizers, vermicompost and biopesticides. *Panchgavya* improves soil fertility and provides food grains free from the hazards of using chemical fertilizers/pesticides. No other fertilizer in the world is as cheap and harmless as dung fertilizer. Dung and urine also provide valuable alternate source of energy in the form of biogas, fuel and electricity (Dhama *et al.*, 2005b).

### 2.3 Qualities of cow urine in Ayurveda

All qualities of cow urine are written in the chapter 45 of *sutra sthan* of *Sushrut sanhita* which is five thousand years old Ayurvedic text (which is from Vedas). Following qualities are described in *Sushrita Samhita* *sutra section chapter* 45 verse 217, 220 and 221 as cow urine is bitter, pungent, hot, easily digestible, strengthens brain and cures cough. It is a destroyer of colic, stomach pain, constipation, itching, eczema and oral diseases. It destroys vitiligo, leucoderma and leprosy, and cures eye diseases. It cures amebiosis, dysentery, diarrhoea, all problems due to gas, cough, swelling, stomach diseases, jaundice, spleen enlargement, ear diseases, asthma, constipation and anaemia. References to cow urine's qualities have also come in other ayurvedic texts as *Charaka Samhita, Rajnighantu, Vriddha vagbhatt* and *Amritsagar*.

### 2.4 Composition of cow urine

Urine is formed to keep the composition of the extracellular fluids constant, and generally most substances that are present in extracellular fluid are also present in urine (Reece, 2005). Urine contains mainly water, minerals, urine cast and other waste products of the body and the composition of urine varies according to the species, breed, season, physiological status, quality and quantity of water consumed (Siener and Hesse, 2002) and in a few pathological conditions as in diabetes and ketosis (Belyaev, 1976).
Kumar (2001) studied various biochemical constituents in the urine of cow, buffalo and goat and arrived at a conclusion that, the biochemical constituent composition varies between the species.

Cow urine contents are 95% water, 2.5% urea and 2.5% minerals, salts, hormones, and enzymes. It contains iron, calcium, phosphorus, carbonic acid, potash, nitrogen, ammonia, manganese, sulphur, phosphates, potassium, urea, uric acid, amino acids, enzymes, cytokine, lactose etc. (Bhadauria, 2002).

Copper has the power to destroy diseases and act as an antidote. Cytokines and amino acids might play a role in immune enhancement. *Gomutra* alone has got all such chemical properties, potentialities and constituents that are capable of removing all the ill effects and imbalances in the body (Chauhan and Singh, 2001).

Cow urine contains various inorganic compounds including silver, Na-K ratio of 4:1 (36%:9% in dried urine), apart from about 3% urea. Fresh cow urine also contains 50-100 mg oestrogens/100 ml; 20-200 µg of cortico-steroids /100 ml and 0.05-0.15 mg of 17-keto-steroids/100 ml (Apte and Balachandra 2002).

Parihar *et al.* (2004) measured the concentration of some minerals by atomic absorption spectrophotometry in the urine of Sahiwal, Crossbred and Non-descript (Desi breed) cattle and the details are presented in the following table.

<table>
<thead>
<tr>
<th>Element</th>
<th>Crossbred</th>
<th>Sahiwal</th>
<th>Non-descript</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zinc (µg/ml)</td>
<td>0.46 ± 0.13</td>
<td>0.67 ± 0.15</td>
<td>0.75 ± 0.06</td>
</tr>
<tr>
<td>Iron (µg/ml)</td>
<td>22.25 ± 4.67</td>
<td>15.45 ± 2.12</td>
<td>10.7 ± 1.82</td>
</tr>
<tr>
<td>Magnesium (mg/ml)</td>
<td>1.13 ± 3.41</td>
<td>13.49 ± 2.49</td>
<td>15.07 ± 2.51</td>
</tr>
<tr>
<td>Potassium (mg/ml)</td>
<td>24.41 ± 2.49</td>
<td>26.50 ± 2.33</td>
<td>37.21 ±16.16</td>
</tr>
<tr>
<td>Calcium (µg/ml)</td>
<td>82.02 ± 13.26</td>
<td>23.76 ± 6.55</td>
<td>152.4 ± 27.11</td>
</tr>
<tr>
<td>Copper</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
</tr>
</tbody>
</table>

ND: not detected
Non-descript cattle showed maximum concentration of zinc, potassium and calcium when compared to Sahiwal and crossbred cattle.

The amount of urine excreted daily varies with the diet, work, external temperature, water consumption, season and other factors. The specific gravity of urine varies with the relative proportion of dissolved matter and water. The greater the volume, lower will be the specific gravity. Cattle produce on an average of 17-45 ml/kg body weight/day of urine with mean specific gravity of 1.030-1.045 (Reece, 2005).

An adult human being may produce 400 litres of urine per year containing 4.0 kg of nitrogen, 0.4 kg of phosphorus and 0.9 kg of potassium (Shayo, 2003). The nitrogen is mainly found as urea (80 per cent), ammonia (7 per cent), creatine (6 per cent) and the remaining part is in the form of shorter peptides and free amino acids (Lentner et al., 1981).

Kirchmann and Petterson (1994) found that stored human urine had pH value of 8.9 and composed of cations like Na, K, NH₄, Ca and anions like, Cl, SO₄, PO₄ and HCO₃. Nitrogen was present as ammoniacal form with ammonium bicarbonate being the dominant compound. Urea and urates decomposed during the storage. Heavy metal concentrations were low but, copper, mercury, nickel and zinc were 10-500 times higher than in precipitation and surface waters.

Rajanarayanan and Archunan (2004) indicated that, during estrous pheromones and the vaginal mucus excreted through urine; influences the Flehmen reaction in male buffalos.

2.5 Importance of cow urine

Now a days, a lot of emphasis has been given on the medicinal use of cow urine in India. Recently the cow urine has been granted U.S. Patents (No. 6,896,907 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 (Dhama et al., 2005a).

Traditional medicinal practitioners of Buddhist culture in Myanmar are still using cow urine therapy for many ailments with encouraging results. The customs practiced have roots which date back to
the Buddhist era over 2500 years old. They ferment the fruits of *Phyllanthus emblica*, *Phyllanthus simplex* and *Terminalia chebula* in a clay pot and drink daily early morning (Awale et al., 2006).

Purihar et al. (2004) revealed that the cow urine can be used for the treatment of eczema, burns, hepatitis, jaundice, immunological disorders, dysentry, cancers and diabetes.

### 2.6 Cow urine as an antimicrobial agent

Scientists/clinicians are facing problems in modern allopathic treatment due to the multiple drug resistance in microorganisms, presence of antibiotic residues in food chain and/or associated allergies and autoimmune disorders in man and animals. Immune suppression occurs as a result of the environmental pollution, use of agrochemicals and presence of pesticides, heavy metals, fungal toxins etc. in the food chain. As a result of immune suppression or deficient functioning of macrophages leads to inefficacy of antibiotic drugs, development of resistance in bacteria, recurrent infections, and or decreased immune status of an individual. As per WHO, the twentieth century wonder drugs “antibiotics” will not remain useful and become almost ineffective by the year 2020. Under these circumstances one has to think over the alternative therapeutic approaches to control the infections (Garg and Chauhan, 2003; Chauhan, 2005).

Cow urine can be used as a feed additive since it has bioenhancing effect when used in combination with antibiotics (Singhal et al., 2007).

Disinfectant prepared using cow urine and plant extracts (*Neem*, *Tulsi*, *Ritha* and Pine oil) is biodegradable and ecofriendly with good antibacterial action (Mandavgane et al., 2005).

### 2.7 Cow urine and wound healing

Maheshwari et al. (2005) created 2 to 2.5 cm wounds in dogs on dorsal neck. Cow urine was applied topically to one group, both topically and orally to another group, which was compared with the antiseptic cream (Lorexane) application. Wounds were dressed once in a day. They found satisfactory results like decreased healing time in cow urine treated wounds when compared to antiseptic cream applied
wounds. They also concluded that administration of cow urine orally adds the effect on wound healing by virtue of its antiseptic and immunomodulatory effect.

Jani et al. (2005) treated a common Langur (Presbytis entellus) having chronic moist eczema on the lateral aspect of abdomen successfully by using cow urine as dressing fluid to wash the affected area. After cleaning the affected area, a paste of cow dung cake and cow ghee was applied twice a day for five days. The affected area was healed up with new skin and granulation tissue in a fortnight.

2.8 Cow urine as a bioenhancer

Recently cow urine distillate has been granted U.S. Patents (No. 6896907 and 6,410,059) for its medicinal properties, particularly for its bioenhancer activities of commonly used antibiotics, anti-fungal and anti-cancer drugs. The activity of Rifampicin, a front-line anti-tubercular drug used against tuberculosis, increases by about 5-7 folds against E. coli and 3-11 folds against Gram-positive bacteria. Potency of ‘Taxol’ (paclitaxel) has been observed to get increase against MCF-7, a human breast cancer cell line in in-vitro assays (The Hindu, 4 July, 2002; The Indian Express, 4 July, 2002).

Bio enhancement 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, it can promote and augment the bioactivity or bioavailability or the uptake of drugs in combination therapy and reduce the dose and duration of treatment. The bioenhancing property highlight the beneficial role of cow urine in treating bacterial infections and cancers and that cow urine enhances the efficacy and potency of therapeutic drugs (Dhama et al., 2005a).

2.9 Cow urine as an immunomodulator

Considering the immunosuppressive effects of pesticides and immunopotentiating properties of cow urine, Sonu et al. (2006) evaluated the immunomodulatory properties of cow urine on dimethoate-induced immunotoxicity in avian lymphocytes using lymphocyte proliferation assay. In their study, avian
lymphocytes showed marked decrease when treated with thousand times dilution of No Observable Effect Level (NOEL/103) dose of dimethoate, while significant increase in both B and T cell blastogenesis was observed when exposed to cow urine. Combination treatments of NOEL/103 dose of dimethoate and the cow urine also revealed a significant increase in both B and T cell blastogenesis as compared with the dimethoate treated cells.

In poultry, cow urine enhances the immunocompetence and provides better protection along with vaccination and increases egg production and egg quality (Dhama et al., 2005b).

Kumar et al. (2004) evaluated the blastogenic activity of lymphocytes and effect of in-vivo cow urine treatment on blastogenesis, so as to find out their potential to mount protective immune response against diseases in chicks. The increase in lymphocyte proliferation activity was maximum during first two weeks of development. During developmental period cow urine enhanced the T- and B- cell blastogenesis by 1.81% and 2.21%, respectively. Similarly, Chauhan and Singh (2001) reported that cow urine significantly enhances T- and B- cell proliferative activity in mice.

2.10 Cow urine on the production traits

Garg et al. (2005) evaluated the effect of distilled cow urine on the nutrient utilization by the white leghorn layers. They found an increase in feed intake, decreased feed conversion ratio and feed efficiency ratio significantly in the distilled cow urine treated group.

Cow urine has the capabilities to potentiate the egg production and can be used as feed additive for layer birds in order to get good quality eggs (Garg et al., 2004).

A similar study was conducted by Singh et al. (2007), where 80 hens and 20 cocks were evaluated for the effect of cow urine distillate on quality, fertility and hatchability of eggs. The results showed highly significant effect of cow urine distillate on fertility of eggs, hatchability, egg weight, albumen index and shape index of eggs between treated and untreated hens.
Golder et al. (2007) conducted a study with a view of converting urine into bio-wealth in the form of zooplankton. The nutrient potentials of human urine, human–cow mixed urine, cow urine, vermin-compost, poultry droppings, mixed wastes (vermin–cow–poultry) and cow dung were evaluated for the mass culture of zooplankton *Moina micrura*. Total number of *Moina micrura* enumerated in the culture tank, related with offspring production per life span, was maximum in case of human urine treatment, followed by human–cow mixed urine, cow urine, vermin-compost, poultry droppings, vermin–cow–poultry wastes and cow dung. The relationship between the total offspring production per female per life span and the nitrogen content of water in different treatments implied that human urine was an excellent liquid waste followed by cow urine that can be used for the mass production of zooplankton *Moina micrura* required for larval and post larval rearing of commercial fishes.

2.11 Cow urine and hepatoprotection

Asma et al., (2006), induced hepatotoxicity in mice using CdCl$_2$ and treated one group with ‘kamdhenu ark’ and another group with Zn and ‘kamdhenu ark’ up to 60 days. Treated animals revealed hepatocytes with normal cellular features and prominent nuclei in comparison to CdCl$_2$ treated group. These observations suggest that ‘kamdhenu ark’ has antagonistic effects against the cadmium-induced liver toxicity and it also work as a bioenhancer of Zn.

*Bramhi ghrita* a formulation that belongs to the panchagavya class of Ayurvedic formulations, used in combination with herbs significantly reduced the levels of serum marker enzymes, serum glutamate oxaloacetate transaminase (SGOT), serum glutamate pyruvate transaminase (SGPT), alkaline phosphatase and acid phosphatase elevated during carbon tetrachloride-induced hepatotoxicity. It was confirmed by histopathological study of liver from different groups (Achliya et al., 2004).

2.12 Antioxidant properties of cow urine and its distillate

The redistilled cow's urine distillate (RCUD) possesses strong antigenotoxic and anticlastogenic properties against human polymorphonuclear leukocytes (HPNLs) and human peripheral lymphocytes (HLC) treated with manganese dioxide and hexavalent chromium (which induce DNA strand break,
chromosomal aberration and micronucleus). This property is mainly due to the antioxidants present in RCUD (Dutta et al., 2006).

Another study was conducted by Krishnamurthi et al. (2004), wherein the antigenotoxic/antioxidant properties of cow's urine distillate and redistillate were studied in vitro using Actinomycin-D and hydrogen peroxide (to cause DNA strand break). They concluded that the redistillate of cow's urine possess total antioxidant status, contributed mainly by volatile fatty acids (1500 mg/L) which might cause the protective effects.

2.13 Cow urine in the treatment of diabetes

Cow's urine mixture, a traditional remedy for convulsions, administered intra-peritoneally to fasting grey rabbits was found to produce marked depression of their plasma glucose. A similar effect on the plasma glucose was produced by a sample of cow's urine mixture given by the nasogastric route. These findings confirm that the mixture has hypoglycaemic effect when given both parenterally and orally, the latter being the usual mode of administration of this concoction (Grange, 1981).

A herbal preparation prepared using cow urine and Gymnema sylvestre, Momordica charantia, Eugenia jambolana, Aegle marmelos, Cinnamomum tamala, Aloe barbadensis and Trigonella foenum-graecum was studied by Jarald et al. (2008) for antidiabetic activity in alloxan-induced diabetic rats. They concluded that herbal preparations made of cow urine significantly lower the blood sugar level when compared to the preparation prepared using water. Fresh cow urine also exhibits antidiabetic effect.

Vadivelan (2007) induced diabetes in rats using streptozotocin (45 mg/kg). He treated the diabetic rats with cow urine and observed weight gain, decreased blood glucose, serum cholesterol, triglycerides, BUN and serum creatinine when compared to the diabetic control group.

2.14 Cow urine as an antiprotozoal agent

Singh (2005) found out the anti-leishmanial effect of cow urine while searching for an alternative to fetal calf serum (FCS), which is used as a growth supplement in the media for Leishmania donovani, an
intracellular protozoan parasite causing Leishmaniasis or kala-azar, a disease which is highly endemic in the Indian sub-continent.

**2.15 Cow urine in agriculture**

Cow urine is used in many of the agricultural operations as a biofertilizer and biopesticide.

**2.15.1 Biopesticide**

Cow urine as such and/or after addition of neem leaves is a wonderful biopesticide. Such biopesticides are safe to use, do not accumulate in the food chain and as such do not have the harmful effects like chemical pesticides. In 10 litres of cattle urine, about 2 kg of neem leaves are soaked with some other vegetable matter and can be used in proportion of 1:50 for spraying. Cow dung mixed with cow urine makes excellent manure and a natural pesticide. Pest repellent prepared from cow urine and neem leaves exhibits excellent insecticidal, fungicidal and pesticidal properties and also exerts excellent plant growth promotion property (Dhama et al., 2005b).

Gupta and Yadav (2006) conducted field trials in kharif season for evaluating cow urine efficacy against stem borers and cost benefit in soybean production in comparison to conventional insecticide (chlorpyrifos) and biopesticide (Dipel). They concluded that, the plant infestation of Girdle beetle, *Obereopsis brevis* and Stem fly, *Melanagromyza sozae*, was significantly reduced in plots sprayed with cow urine. The highest cost benefit ratio and high yield per hectare was also obtained in cow urine sprayed plots.

According to Vaidya (1993), cow urine is the most effective solution for the control of *Lipaphis erysimi, Myzus persicae* and *Dorylus orientalis*. Budhathoki (1992) reported that diluted cow urine applied on broad leaf mustard significantly reduces powdery mildew. Farmers use cow urine in various concentrations (1:2 to 1:5) as curative plant protection measures against aphids of cowpea and bean and late blight of potato and tomato (Gyawali et al., 1994).
Subedi and Vaidya (2003) evaluated cow urine and buffalo urine for the pesticidal activity against flea beetle, *Phyllotreta nemorum* at three concentrations (20, 15 and 10%) and observed significant results at all concentrations.

### 2.15.2 Biofertilzer

Distillation waste (plant herbage after distillation) and cow's urine have been used for production of vermicompost. Addition of cow's urine in composting pits led to production of superior quality vermicompost with higher concentrations of major macro-and micro-nutrients and was found to be superior in terms of useful microflora (fungi, bacteria and actinomycetes). Application of this vermicompost in pots significantly improved the yields of leucerne (*Medicago sativa*). Cow urine acts like a disinfectant and thus purifies atmosphere and improves the fertility of the land (Dhama *et al.*, 2005b).

Ledgard *et al.* (1982) examined the effects of cow urine and equivalent nitrogen, potassium and sulphur treatments on pasture yield, botanical composition, herbage chemical composition and N-fixation by clovers during winter and spring. They found that urine caused a large increase in ryegrass yield, due entirely to its N component. The effects on yield lasted 2-3 harvests and was followed by a decrease in clover growth. Urine increased the N concentration of grass (particularly the nitrate fraction) and increased the potassium concentration of grass and clover. It also markedly decreased the N fixation by clover, particularly during the winter.

According to Guadarrama *et al.* (1996), urine used as fertilizer is the best in cultivation analyses, owing to the availability of its nutrient which, at the same time combined with soil humidity, acts as an optimal environment for the micro fauna and the mineralization process. The urine is free of enteric microorganisms coliforms, enterococci, coliphages and clostridia and can be used safely as a fertilizer (Tanski *et al.*, 2007).

Simons and Clemens (2003) found that human urine (acidified to pH<5) mixed with animal slurry, which has a high buffer capacity can be used as a fertilizer. Wolgast (1993), concluded that urine contains
88 per cent of N, 67 per cent of P and 71 per cent of K and faeces contains 12 per cent of N, 33 per cent of P and 29 per cent of K.

2.16 Value added products of cow urine

2.16.1 Cow urine distillate (arka/ark)

It is a product of cow urine prepared by condensing the vapors of fresh cow urine using a glass distillation apparatus. One such product is prepared and marketed as Amrutha sara (Gomutra arka) by the Amruthadhara Goloka, Hosanagara, Shimoga district, Karnataka.

2.16.2 Gaumutra ghanvati (Tablet)

Prepared by boiling cow urine in a deep iron pan till it becomes concentrated and salts remain. When the cow urine is concentrated, it is removed from fire, cooled and scratched from the pan to make round tablets of the size of gram. From one kilo cow urine 50 g concentrate is available. To make tablets non-sticky, the tablets can be stored with fine ashes of good quality cow dung cake.

2.16.3 Cow urine soft drink ("gau jal")

A report of Times Online, February 11, 2009 says that, the cow protection department of the Rashtriya Swayamsevak Sangh (RSS), India’s oldest Hindu nationalist group (founded in 1925) is going to launch a product called the "gau jal" which means "cow water" in Sanskrit by the end of this year. This bovine brew made mainly of cow urine, mixed with a few medicinal and ayurvedic herbs is in the final stages of development and undergoing laboratory tests.

2.16.4 Cow’s urine concoction (CUC)

The concoction is prepared from leaves of tobacco, garlic and basil; lemon juice, rock salt and bulbs of onion. The latter items are soaked in the urine from cows which acts as the vehicle in which the active principles in these constituents dissolve. Over fifty chemical compounds have been identified in
CUC. The major compounds it contains are benzoic acid, phenylacetic acid, p-cresol, thymol and nicotine (Oyebola, 1983).

2.17 Acceptance of cowpathy by public

The growing awareness among the general public about the side effects of allopathic medicine is making them to use cow urine therapy/panchagavya chikitsa for few ailments wherein some benefits are derived. Though, the end user claims are many, scientific validation of those claims is required. However, scientific validation of Panchgavya products is required for its worldwide acceptance and popularity in terms of agricultural, energy resource, nutritious and medicinal applications so as to exploit the optimal power of Panchgavya for the service of mankind. Regardless of scientific validation, people are using and getting benefits of it.

2.18 Institutions involved in Panchgavya/cow urine therapy

- Love-cow trust, New Delhi.
- Go-Vigyan Anusandhan Kendra (Cow Science Research Centre), Nagpur, Maharashtra. The cow urine therapy and research institute, Indore, Madhya Pradesh.
- Gau seva ayog, Gujrat.
- Kanpur gaushala society, Kanpur.
- Cow therapy society, Pantanagar, Uttar Pradesh

2.19 Cow urine and toxicity

There are no reports of toxicity cases encountered with the usage of cow urine or distillate; however there are reports of poisoning of cow’s urine concoction (CUC) a traditional remedy for convulsive seizures in Nigeria.

2.19.1 CUC poisoning
CUC administration caused severe poisoning with a fatal outcome in Nigerian children during early 1970s. Following the incidence, Oyebola and Elegbe (1975) carried out experimental investigations in mice to assess the toxicity of concoction. Effect of the preparation was compared with that of pure nicotine. The effect of each component used in preparing the concoction was also tested. Results of the experiments show that both "cow's urine" and nicotine cause excitement in low doses and cause convulsion and/or death in higher doses. Both also depress respiration.

Observations of CUC poisoning in man and experimental animals showed that the main effects of CUC are severe depression of respiration, cardiovascular system, the central nervous system and hypoglycaemia. These toxic effects acting singly or in combination are believed to be the cause(s) of death from CUC (Oyebola, 1983). The effects on cardiovascular system include, an initial bradycardia followed by tachycardia and a biphasic effect on blood pressure characterized by a fall followed by a rise. On the respiratory system, a short period of respiratory arrest and/or respiratory depression, followed by tachypnoea with associated hypoventilation of the lungs (Elegbe and Oyebola, 1977).