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Evaluation of Physio-chemical properties of Gir cow urine during winter season

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Abstract

Cow is considered very sacred in India and cow urine is considered as medicine since time immemorial. It is used to cure many ill conditions and thought to prevent many diseases. Cow urine and cow dung are also thought to increase the soil fertility and used as fertilisers. The present-day chemical fertilisers and allopathic drugs both have significant side effects on soil and human health respectively. The present study focuses on finding out the composition of cow urine of Gir cattle in winter season. The study will provide the insight about the constituents of cow urine that are beneficial for health and also as fertiliser.

Key words : Chemical, Cow, Gir, Fertiliser, Urine.

India has raised cows for hundreds of years; cows are revered on all significant occasions and are viewed as mothers. Numerous festivals, such as Gopa Asthami, Vasubara, Dhanteras, Padwa, and others, are specifically honoring cows. Since the beginning of time, cows and rural Indians have had a relationship. The cow, also known as Kamdhenu, signifies giving its all. They provide us Panchagavya, which is defined as Something We Get from Gau, i.e. Cow, and Pancha as Five. They are cow dung, urine, milk, curd, and ghee. All of them are considered as holy. According to Ayurveda, these products are not only edible but also very therapeutic. They are thought to be agents that cleanse and nourish the body. They also refer to the five elements of the body as Panch Mahabhuta.

Gir cattle: Best Milch Breed of Gujarat *:*

According to Natioanl dairy development board, The Gir cow, also called the Sorathi cow, is indigenous to the Gir forest, which includes the Gujarati districts of Rajkot, Junagadh, Amreli, and Bhavnagar. They produce quality milk, and the males can pull large loads over a variety of terrains. One of India's top three breeds for milk production is the gir cow. It is believed that the Gir breed of cow was used to generate other native breeds, such as Deoni

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and Nimari. Gujarat had over 14 lac Gir cows in 2007. They can also be found in significant quantities in Rajasthan, Madhya Pradesh, and Maharashtra At the average age of 38 to 55 months, they begin delivering milk. Each year, they produce 2000–2200 kg of milk with an average fat content of 4-5%. Because of their Ability to give more milk and less feed they have been imported by Brazil, USA, Venezuela and Mexico to bred there.

Morphological characters :

According to Gujarat Livestock Development Board following are the features of gir cow:

Colour : The coat comes in a range of colours, from bright red to black and white in various tones.

Horns : Horns have an odd shape and curvature that resembles a half moon. Males typically weigh 500–540 kg, while females typically weigh 300–350 kg. Leaf like ears.

Cow urine :

The Ayurveda define cow urine as medication. One of Panchagavya's five components is cow urine. Cowpathy is the term for cow-based therapy (Panchagavya Chikitsa). Cow urine is seen as a potentially effective treatment for a variety of conditions, including gynaecological issues, diabetes, asthma, psoriasis, eczema, fits, AIDS, piles, blood pressure, prostate, heart attack, arthritis, migraines, ulcers, acidity, constipation, thyroid, and even cancer. It also boosts the amount of nitrogen in the soil and functions as a fertiliser. All the elements found in human urine naturally occur in cow urine. Therefore, using cow pee as medication keeps all these chemicals in balance within the body and aids in the treatment of serious illnesses like AIDS and cancer. Cow pee is a superior bioenhancer. U.S. patents for distillate of cow urine have recently been obtained.[8]

As per the *Sushruta Samhita*, cow urine is light, alkaline, pungent, hot, and Sharp in nature. That is used to cure kafa and vata dosha in body. It improves digestion and intellect, helps in digestive problems and constipation. Maharshi Charaka wrote cow urine to be useful in skin problems, leprosy, itching and other diseases.[7]

It is reported that cow urine can be used to make the nano particles as other organic solvents are environment polluting and very toxic.[1]

In 1952, research on cow urine was first documented. Twelve studies were conducted between 1960 and 1970, and then five, thirteen, and twelve in the ensuing years. However, following 2001, research on cow urine gained steam, and between 2000 and 2010, 112 studies were conducted. The field saw an even greater increase in the ensuing ten years, with 320 studies conducted between 2010 and 2020. Currently, there are around 470 research publications or articles available on cow urine.[1]

It demonstrates its growing significance in today's study. There has been a significant increase in study on cow-based goods, maybe as a result of the current environmental issues as well as the potentially harmful effects of pesticides, fertilisers, and other chemicals. Cowpathy which means treating the diseases by product of cow is gaining attention. It is

useful in treating many diseases like AIDS, Cancer and Diabetes. Numerous illnesses, including the common cold, allergies, the flu, arthritis, heart conditions, hepatitis, chicken pox, ulcers, leprosy, bacterial and viral infections, leucorrhoea, TB, asthma, skin infections, and a lengthy list of other conditions, can be treated using cow urine. It has ability to alter the DNA damage.[5]

Cow urine has been shown to have antimicrobial activity, even against strains of *Escherichia coli* and *Klebsiella pneumoniae* that are resistant to many drugs. cow urine was discovered to have antifungal properties. The urine of an indigenous breed of cow also demonstrated anthelminthic and antineoplastic properties. It is antioxidant as well. Numerous health issues, including as indigestion, stomach aches, oedema, jaundice, anaemia, haemorrhoids, and skin conditions like vitiligo, can be effectively treated with it. Cow urine has the power to keep the body balanced and rid it of any imbalances.[10]

Panchagavya includes additional cow-derived goods like cow ghee. Cow ghee is said to be very nutritious and helpful in the prevention of many ailments. Ayurveda claims that it improves vision, helps treat skin conditions, strengthens immunity, and promotes wound healing. It has anti-inflammatory, anti-cholinergic, and anti-neoplastic properties. Cow ghee improves digestion and purifies the blood. In addition, it improves appearance, keeps heart problems at bay, and sharpens memory.[2]

Gomaya, also known as cow dung, is an additional gavya that comes from cows. It has therapeutic qualities in addition to being helpful in agricultural operations. It functions as an antifungal and antibacterial agent. It was utilised as a skin tonic and for bathing on auspicious days. It has demonstrated antimalarial qualities. It improves eyesight and aids in the healing of rashes and boils. It is a potentially effective treatment for eczema and psoriasis. Anti-tuberculosis is what it is. Cow dung has numerous qualities that elevate it to the status of medicine.[2]

The amino acids found in cow and sheep urine were originally described by Bathurst[3] in 1952, and they were then compared to those found in human and rat urine. According to Bathurst, urea has the largest concentration of nitrogenous substances, followed by amino acids, which have a range of 10.5 to 16%. Urine samples were hydrolyzed in their experiment, and the results of their estimation of various amino acids were as follows. Seventeen amino acids were examined during the experiment, which was conducted with microorganisms. 90% of all amino acids were attributed to glycine.[3]

In 1992, Bristow[4] estimated nitrogenous compounds in cow urine. He found out the amount of total nitrogen estimated varies between 8.6 to 41.1 gram per litre. Out of total nitrogen present in urine majority was due to urea followed by other ingredients like uric acid, ammonia and free amino acids.[4]

A class of chromogens found in cow urine appear to be derived from carotenoids, which are found in food, exist in conjugated form, and are hydrolyzable by acids. Additionally, Holtz proved that etiocholanolone was present in cow urine.[9]

In contrast to KCl and the control, the application of cow urine increases yield in the first 50 days and also increases nutrient uptake, including potassium and nitrogen uptake as well as phosphorous and magnesium uptake. This experiment was carried out to understand the effect of cow urine on pasture growth and nutrient uptake.[6]

Because urine contains nitrogen, using it in the winter and spring causes a significant increase in pasture production. The chemical makeup of herbage is significantly impacted by the high concentration of nutrients found in cow urine. Moreover, urine reduces the amount of nitrogen that clovers fix, especially in the winter. Because cow urine contains nitrogen, it increases the production of ryegrass. This impact was shown for two to three harvests before clover growth decreased.[11]

1. *Chemicals and Biochemicals :*

The chemicals used in the present study was of analytical reagent grade purchased from standard manufacturers through local dealers.

2. *Glassware and Polyware :*

The glass wares were washed with detergent solution, that was washed off by tap water and followed by distilled water. They were dried in the oven before use.

3. *Sample collection and venue :*

The samples were collected from 3 gir cows form the gaushala. The samples were collected in clean plastic container. That was transferred to sterile labelled bottles and stored in refrigerator till use.

4. *Statistical analysis :*

All parameters are expressed in Average of all replications.

5. *Biochemical analysis :*

Alkaline phosphatase and acid phosphatase and LDH were measured by kit provided by Sigma. Total protein by Lowry's method and vitamin C was measured by oxalic acid and dichlorophenol indophenol dye. Total phenol was measured by method of malick and

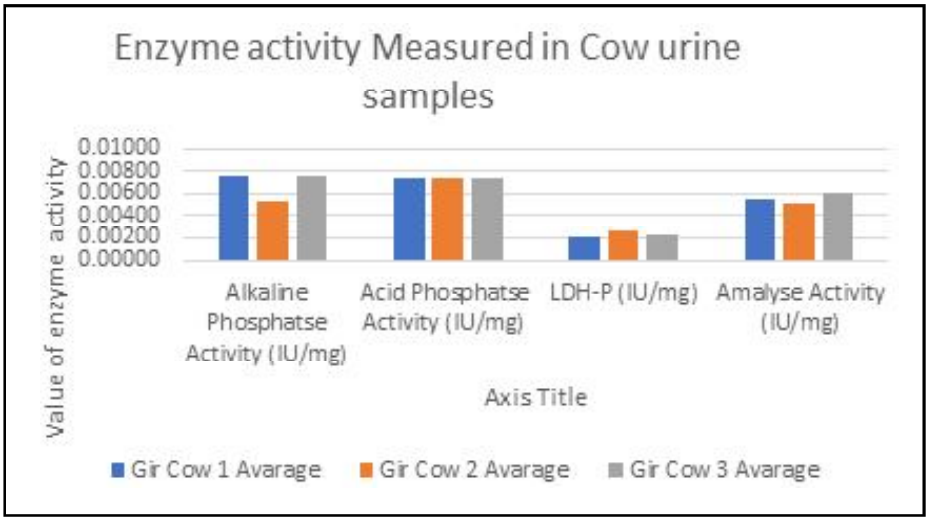
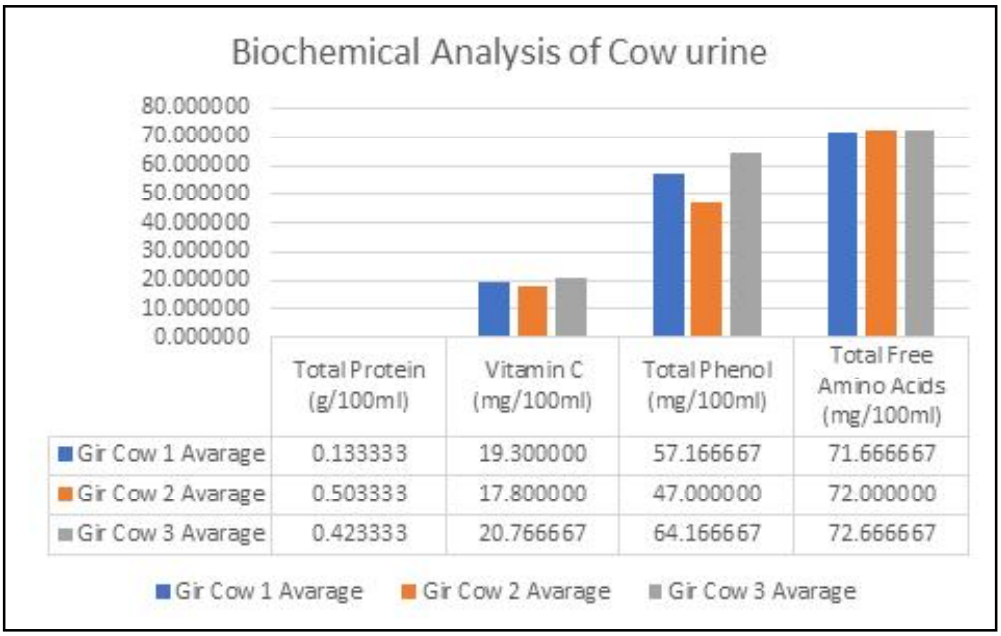
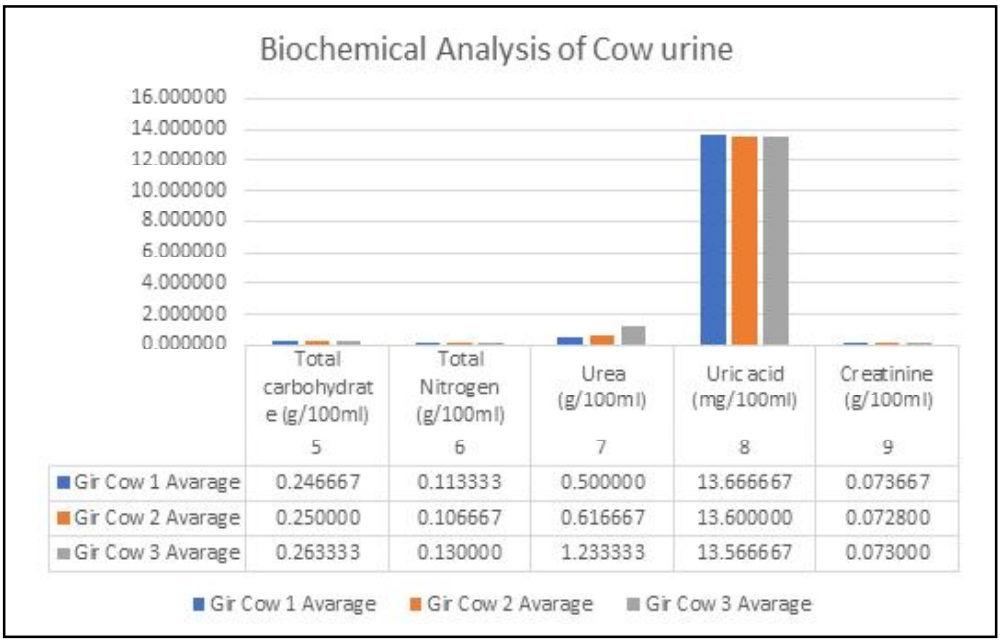


Figure 1. Enzymatic activity measured in cow urine samples.



	Total Protein (g/100ml)	Vitamin C (mg/100ml)	Total Phenol (mg/100ml)	Total Free Amino Acids (mg/100ml)
Gir Cow 1 Avarage	0.133333	19.300000	57.166667	71.666667
Gir Cow 2 Avarage	0.503333	17.800000	47.000000	72.000000
Gir Cow 3 Avarage	0.423333	20.766667	64.166667	72.666667

Figure 2. Biochemical Analysis of Cow urine samples.



	Total carbohydrate (g/100ml) 5	Total Nitrogen (g/100ml) 6	Urea (g/100ml) 7	Uric acid (mg/100ml) 8	Creatinine (g/100ml) 9
Gir Cow 1 Avarage	0.246667	0.113333	0.500000	13.666667	0.073667
Gir Cow 2 Avarage	0.250000	0.106667	0.616667	13.600000	0.072800
Gir Cow 3 Avarage	0.263333	0.130000	1.233333	13.566667	0.073000

Figure 3. Biochemical Analysis of Cow urine.

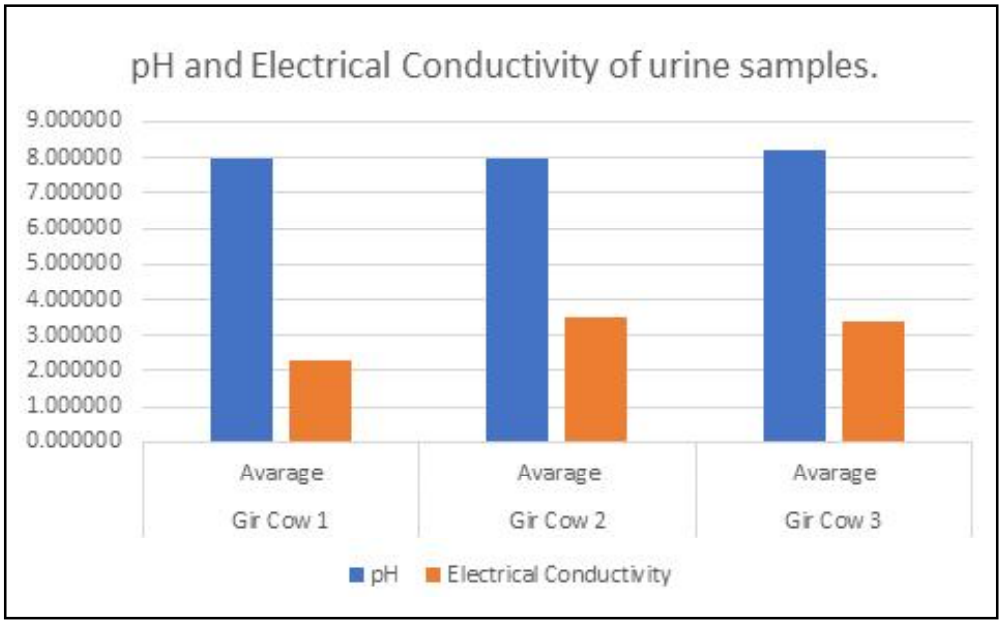


Figure 4. pH and Electrical conductivity of Cow urine samples.

singh. Total free amino acid was measured by method of Lee and Takahashi. Amylase activity was estimated by bern field method. Total Nitrogen was estimated by kjeldahl method. Urea was measured by Kit available. Uric acid was measured by biochemistry analyser ARCHITECT c4000/ ABBOT DIAGNOSTICS. Glucose, Triglyceraide and creatinine was measured by kits provided by Sigma.

The samples were analysed and following results were obtained: Glucose and Triglycerides were absent from all the urine samples. Alkaline Phosphatase and acid phosphatase, Amylase activity and LDH activity was present in all the urine sample shown in figure 1. Protein in low amount was present in all samples, out of which free amino acids contributes to total protein. The amount of Total phenol was high and Vitamin C was also present in all samples. All samples were alkaline in pH. All samples show presence of Nitrogen, Urea, Uric acid and creatinine in different amount shown in figures.

The Urine of Gir cow shows presence of many beneficial components. They may be beneficial for human health as well as for farming. The presence of protein and vitamins and phenols may be corelated with health benefits. The presence of nitrogenous compounds explains its benefits in agricultural practices. Further studies will reveal many such components of high usefulness.

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urine from the very beginning to till date.

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