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Thorn less Cactus (*Opuntia ficus-indica*) as Climate-Resilient Fodder for Dairy Cattle

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Introduction:

Livestock farming plays a crucial role in ensuring the livelihood and nutritional security of rural households in India. However, one of the major constraints faced by livestock farmers is seasonal fodder scarcity, particularly in drought-prone regions. During summer months, the availability of green fodder declines drastically, leading to reduced milk production and poor animal health. Climate change has further aggravated fodder shortages due to irregular rainfall and prolonged dry periods. Therefore, identifying drought-tolerant fodder crops is essential for sustainable livestock production. One such promising option is thorn less cactus, scientifically known as *Opuntia ficus-indica*. This plant has been widely recognized as a climate-resilient fodder resource for dry land livestock systems (Mondragón-Jacobo & Pérez-González, 2001; Makkar, 2017). Research institutions including ICAR-Indian Grassland and Fodder Research Institute have highlighted cactus as a valuable feed resource capable of providing fodder even under extreme drought conditions (Thakuria *et al*., 2020).

Botanical Characteristics:

Thorn less cactus is a perennial succulent plant belonging to the *Cactaceae* family. It produces thick flattened stems known as cladodes, which store water and nutrients. The plant follows Crassulacean Acid Metabolism (CAM) photosynthesis, allowing it to conserve water and survive under arid climatic conditions. Due to this adaptation, cactus can grow and produce biomass even under very limited rainfall conditions (Louhaichi & Hassan, 2020).

Nutritional Value of Thornless Cactus:

Cactus cladodes contain large amounts of moisture and digestible carbohydrates, making them an excellent energy and water source for livestock.

Approximate Nutrient Composition of Cactus Cladodes:

Nutrient	Percentage
Moisture	80–90%
Dry matter	10–20%
Crude protein	4–8%
Crude fibre	10–15%
Total digestible nutrients	60–65%
Calcium	High

Although cactus contains moderate levels of energy, its crude protein content is relatively low. Therefore, it should be supplemented with protein-rich feed sources such as oil cakes or legume fodders (Tegegne, 2001; Kumar *et al*., 2021).

Advantages of Thorn less Cactus as Livestock Feed:

1. **Excellent Drought Tolerance:**

   Cactus can grow under extremely dry conditions with annual rainfall as low as **200–300 mm**, making it suitable for arid and semi-arid regions (Louhaichi & Hassan, 2020).

2. **High Biomass Production:**

   Cactus plantations can produce **200–300 tonnes of green fodder per hectare annually**, depending on management practices and environmental conditions (Thakuria *et al*., 2020).

3. **Water Source for Animals:**

   The high moisture content in cactus cladodes can supply a significant portion of animals' water requirements, reducing dependence on drinking water in drought conditions (Makkar, 2017).

4. **Year-Round Fodder Availability:**

   Once established, cactus plantations provide fodder throughout the year, ensuring feed

availability during dry seasons.

5. **Suitable for Marginal Lands:**

   Cactus grows well in degraded, rocky and saline soils where conventional fodder crops fail (Dev *et al*., 2018).

6. **High Palatability:**

   Livestock such as cattle, sheep, and goats readily consume chopped cactus cladodes when mixed with dry fodder.

Cultivation of Thornless Cactus:

1. **Climate:** Cactus grows best in warm climates with temperatures ranging from **20 °C to 40 °C**.
2. **Soil:** It can grow in a wide variety of soils including sandy and marginal lands but prefers well-drained soils.
3. **Propagation:** The crop is propagated using **cladode cuttings** planted during the rainy season.
4. **Spacing:** A spacing of **1.5 × 1.5 m** is generally recommended for fodder production.
5. **Harvesting:** The first harvest can be obtained **8–12 months after planting**, followed by periodic harvesting depending on plant growth (Dev *et al*., 2018).
6. **Feeding Practices for Dairy Cattle and Goats:** Cactus should not be fed alone due to its low protein and fiber content. Balanced feeding with dry fodder and concentrates is essential.
7. **Feeding Level for Dairy Cattle:** Dairy cows can be fed 10–20 kg of fresh cactus cladodes per day when mixed with dry fodder such as straw (Tegegne, 2001).
8. **Feeding Level for Goats:** Goats can be fed **1–3 kg cactus per day** along with dry fodder and concentrate feed.

Recommended Feeding Method:

1. Remove remaining spines if present.
2. Chop cactus pads into small pieces.
3. Mix with straw or hay.
4. Supplement with concentrate feed or oil cakes.

Sample Ration for a Dairy Cow:

Feed	Quantity
Thornless cactus	15 kg
Paddy straw	5 kg
Concentrate mixture	3–4 kg
Mineral mixture	50 g

Such feeding strategies help utilize cactus efficiently while maintaining balanced nutrition for livestock (Kumar *et al*., 2021).

Role of Thornless Cactus in Drought-Prone Areas:

In India, cactus has been promoted as a strategic fodder resource for addressing feed shortages in dry land regions. Research organizations such as National Dairy Development Board and ICAR-Indian Grassland and Fodder Research Institute have emphasized cactus cultivation as an effective climate-resilient fodder option (Thakuria *et al*., 2020). In Tamil Nadu, drought-prone districts such as Karur, Ramanathapuram, and Dindigul can particularly benefit from cactus-based fodder systems.

Economic Benefits to Farmers:

Cultivating cactus as a fodder crop offers several economic advantages:

- Reduced cost of fodder production
- Minimal irrigation requirement
- Utilization of wastelands
- Improved livestock productivity

Such benefits make cactus a promising feed resource for small and marginal farmers in dry land regions.

Conclusion:

Thornless cactus is a highly promising climate-resilient fodder crop capable of addressing fodder scarcity in drought-affected regions. Its ability to produce high biomass under minimal water conditions and provide energy-rich feed makes it a valuable resource for dairy cattle and goats. With proper feeding management and supplementation, cactus can significantly improve livestock productivity and enhance farmers' livelihoods.

References:

Dev, R., Dayal, D., Shamshudeen, M. and Yadav, O.P., 2018. Thornless cactus: an unconventional, valuable fodder resource. *Indian Farming*, *68*(09), pp.101-103.

Kumar, S., Louhaichi, M., Dana Ram, P., Tirumala, K.K., Ahmad, S., Rai, A.K., Sarker, A., Hassan, S., Liguori, G., Probir Kumar, G. and Govindasamy, P., 2021. Cactus pear (*Opuntia ficus-indica*) productivity, proximal composition and soil parameters as affected by planting time and agronomic management in a semi-arid region of India. *Agronomy*, *11*(8), p.1647.

Louhaichi, M., Atnafe Yigezu, Y., Hassan, S., Naorem, A., Meta-Gonzales, R., Kumar, S., Hamdeni, I., Palsaniya, D.R., Kauthale, V.K., Al-Mahasneh, A.M. and Al-Tawaieh, M.A., 2025. Characterization of cactus pear (*Opuntia ficus-indica*) production systems and analysis of the adoption and economic viability of spineless cactus for animal feed in four continents. *Cogent Food & Agriculture*, *11*(1), p.2550493.

Makkar, H.P.S., 2017. Cactus as a fodder and beyond. *Broadening Horizons. Feedipedia. Rome: Animal Production and Health Division, FAO*, pp.1-6.

Mondragón-Jacobo, C. and Pérez-González, S. eds., 2001. *Cactus (Opuntia spp.) as forage* (Vol. 169).

Food & Agriculture Organization.

Tegegne, F., 2001. Nutritional value of Opuntia ficus-indica as a ruminant feed in Ethiopia. *FAO Plant Production and Protection Papers*, pp.91-100.

Thakuria, A., Datt, C., Shambhvi, K., Gajender, D., Thamizhan, P. and Yadav, R.K., 2020. Edible spineless cactus (Opuntia ficus-indica): A promising alternative forage source for livestock. *Indian J Dairy Sci*, *73*(3), pp.185-191.