



International Center
for Agricultural Research
in the Dry Areas

BRIEFING

Promoting Cactus as an alternative and sustainable livestock feed



The village of Zelfane-Kasserine in Tunisia is home to 16000 ha of cactus and is considered the main source of income for the local population

Given their high water efficiency and ability to withstand extremely dry conditions, cactus is increasingly being recognized as a more sustainable alternative to traditional livestock forage in dryland areas. This high-energy, nutrient-rich plant can reduce pressures on already-depleted natural resources and provide farmers with a guaranteed source of water during the dry season. As knowledge of these benefits spreads, cactus-producing countries are refining the cultivation, harvesting, and processing of this valuable resource.

Encouraging cactus production in Tunisia

Cactus is increasingly being used as an alternative source of livestock feed in Tunisia, where a government-run scheme administered by the Pasture and Livestock Agency (OEP) is providing subsidies to participating farmers. The subsidies are determined by growing area and compensate for lost income over a three-year period during which cactus plants are planted and become established. Guaranteed prices set by government agencies are further encouraging the plant's cultivation, and beyond government incentives, farmers are responding positively to growing public demand for cactus fruit and cladodes – they can earn at least 0.024 US Dollars for each cladode.

The benefits of cactus production

With its high water efficiency and content, cactus can sustain livestock through the driest of seasons. A well-developed root system also allows these versatile plants to grow in marginal areas where other forage species often fail. Compared to many other common crops and fodder, cactus is easy to establish, maintain, and utilize.

The plant generates a high biomass of green forage – ranging from 30-250 tons/ha in semi-arid areas – which is packed full of essential nutrients, reducing the intense pressure that livestock might otherwise exert on scarce water resources and other rangeland plant species. Cactus has the potential to significantly reduce the need for other high-energy feeds such as barley grains and maize – and unlike these crops, its excessive consumption will not cause acidosis in ruminants as a result of high levels of mucilage, which enhance insalivation and avoid serious decreases in pH.

Several studies have demonstrated the additional economic gains that can be generated by incorporating cactus cladodes into ruminant diets, such as improved meat quality, which results from an increase in the proportion of conjugated linoleic acid.



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Proven techniques for effective exploitation

Despite its suitability as an alternative source of livestock feed, cactus plants are fragile and should not be grazed directly by animals – a practice that could be highly destructive and drastically shorten the longevity of cactus plantations. Instead, cladodes should be harvested, cut into small pieces, and distributed to animals - a 'cut and carry' methodology that is common in many cactus-cultivating countries, including Brazil, South Africa, and Tunisia.

This strategy has been aided by the manufacture of small machines powered by electricity or hydraulic motor, which are designed to cut cactus cladodes rapidly and efficiently. Modestly priced – they cost between 200 and 500 US Dollars – these tools can replace the time-consuming and labor demanding requirements of cutting cladodes by hand. If prices are beyond the means of low-income smallholder farmers, costs can also be shared.



Machines powered by electricity or hydraulic motor are designed to cut cactus cladodes rapidly and efficiently

Given that cactus is low in fiber and nitrogen, its effectiveness as a livestock feed can only be fully realized if it is mixed with other feedstuff: fibrous material, such as hay or cereal straws, and sources of nitrogen such as shrubby legumes, cotton seed meal, and sunflower meal. Conversely, cactus can be used to improve other unbalanced feed: the low energy and high salt content of Saltbush, for example, can be corrected by the high sugar and water content of cactus cladodes. Furthermore, cactus cladodes and cactus fruit have been incorporated successfully into feed blocks as a catalytic supplement for sheep and goats which were previously fed on low quality forage or allowed to graze already degraded rangelands.

SUCCESSES: Incorporating cactus into livestock feed

- Lambs fed on straw supplemented by cactus and Saltbush in Tunisia grew at a rate of 80 g per day
- Dairy cattle in Brazil, receiving a complete mixed diet composed of 60% ground cactus cladodes, 20% chopped hay, and 20% protein-rich concentrate, yielded around 25 liters of milk per day
- South African lambs fed on a diet of sun-dried and coarsely-ground cactus cladodes mixed with Lucerne hay, yellow maize meal, sunflower olive cake meal, and molasses meal, grew at similar rates to those receiving a conventional diet – at a fraction of the cost
- In Brazil, Morocco and Tunisia, farmers have preserved silage composed of cactus cladodes and other local ingredients through ensiling – a process that allows bacteria to ferment plant sugars and produce organic acids, which in turn lower pH to a level at which bacteria can no longer grow. The resulting feed has improved the milk production of dairy cattle and aided the growth development of goats and sheep.

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