

Four simple steps to turn prosopis beans into a valuable food and fodder

A note to inform aid agencies, rural health and nutrition advisors, agriculture and forestry extensionists, government departments, national and international NGOs, and research and development organisations.

Increasing the wise use of prosopis beans can aid human nutrition and food security.

What is prosopis?

The common prosopis (synonyms; mesquite, algarrobo) trees in the drylands of Africa, Asia and Oceania were introduced from tropical America in the last two centuries. There are several species, all are very similar in appearance. *Prosopis juliflora* and *Prosopis pallida* are most common in tropical regions. *Prosopis glandulosa* and *Prosopis velutina* are found in sub-tropical areas that have occasional frosts. These species are very hardy and are popular sources of timber, fuel wood, livestock fodder and human food. In Peru, for example, beans are collected, dried, milled and mixed to make a variety of foods and animal feeds, and prosopis beans help supplement the diets of humans during the long dry seasons. However, where prosopis trees have been introduced they are hardly ever used, even when people and their animals go hungry. Overconsumption of whole pods by animals during droughts can cause health problem, but prosopis is not poisonous, its consumption just needs to be managed. Learning how to collect, dry, mill and mix the pods can make the most of this abundant and nutritious 'free' food! Whilst the processing is simple, and the *potential benefits are enormous*, the subjects of milling, processing equipment and suitable training of people in areas where prosopis is common requires a transfer of knowledge into rural health, agriculture and development programmes. Collecting and milling prosopis beans would also help to assist in the management of prosopis where it is an invasive weed, currently a problem on 10 million hectares in Africa alone.

Collect – Dry – Mill – Mix

1. Collect fruit directly from the tree when ripe and golden-yellow. Recently fallen pods on the ground can also be collected for animal feed, but leave old, damaged or discoloured fruit. Fill used cereal sacks, each will hold 25 kg of beans when full, and tie. Working in thorny thickets, it is advisable to have machetes to clear the way, and to wear strong shoes, clothing and leather gloves.

Ripe beans for picking (Kenya)



Collecting pods for fodder (Brazil)



Carrying the harvest home (Djibouti)



2. Dry freshly collected beans by spreading on sheets, roofs or concrete floors. Leave for four full days of hot sun. It is better to process immediately for human use, or store in sacks or heaps protected from animals. Use covered sheds and raised floors for long-term storage. Beans can be kept for over a year before milling, though fumigation against seed-eating beetles may be required.

Sun drying for human food (Kenya)



Open bean store for fodder (India)



Beetle damage in stores (Djibouti)



3. Mill into flour with existing village grain mills used for maize or other cereals, with pestles and mortars, or many other types of mill can be used. Mesh size decides the fineness of the flour, but sieving may also be needed. Beans must be completely dry or the sugary pulp will gum up the mill, which will then require cleaning. Convincing a mill owner to use the mill for prosopis may not be easy, especially in areas where they think the beans are poisonous.

Tractor-powered milling (Kenya)



Small village mill (Djibouti)



Crusher for livestock feed (India)



4. Mix up to 20% prosopis flour with wheat, maize or other flour for human food such as chapattis, tortillas, bread, biscuits, cakes, pancakes, or mix with water to make a refreshing drink. For livestock feed, 20% of a coarser bean flour is often used, increasing to 50% in survival rations during droughts. Flour is commercially available as a ready-mixed livestock feed.

Serving up prosopis food (Kenya)



Organic bean flour (Argentina)



Prosopis livestock feed (Brazil)



Are there any negative health effects from eating prosopis beans?

Prosopis flour can be incorporated into many dishes, for example as a *flavour enhancer*, *sweetener* or *fibre fortifier*. It is effective as a substitute for refined sugar owing to its high sugar content. Highly toasted prosopis flour can double or even triple the fibre content of foods to which it is added without a considerable affect on the smell, taste or texture of the food. The flour is suitable for incorporation into many foods owing to its smooth and fine texture. The *oxidation activity* is lower for prosopis than for most cereal flour; therefore it can be stored for longer either pure or mixed with other foods *and can be used during periods of food shortage*. " Like those of many legumes, prosopis beans may contain some nutritional factors but these are well within the allowable limits and do not cause ill effects if mixed and cooked with other foods (see section 4). As with other grains and pulses, contamination with bacteria and fungal toxins is possible if the beans are not sufficiently dried, not cleaned before processing, kept on the ground, or stored for too long. Prosopis beans are particularly susceptible to storage problems as they are sugary and absorb water from the atmosphere.

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