

The indigenous knowledge of sheep-keepers in an isolated mountainous area of southern Mexico provides a basis for improving flock health. Mexican scientists have been learning from these illiterate but highly skilled women.

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All over the Chiapas highlands, at about 2200 m above sea level, more than 200,000 Tzotzil Indians care for an almost equal number of sheep of the local breed.

For several weeks we had been regularly visiting Sabaxan, an Indian shepherdess. We talked about her sheep and the way she keeps them healthy and productive. One day a young ram from a different flock was brought to her home and treated for a testicle inflammation. With great interest we observed how the case was handled: Sabaxan kept the ram isolated from her flock and, for a few days, gave it external and oral doses of an infusion of a plant known in the Tzotzil language as *k'ux peul* (*Solanum lanceifolium*). Either the remedy was strong enough or Sabaxan's prayers were heard by the Holy Shepherd John the Baptist, or both. Within a week, the animal was in good health and back in its flock.

With our veterinarian background, we could have suggested antibiotics and anti-inflammatory drugs for such a case, but we had learnt very important facts from our previous visits to the Indian hamlets: these shepherdesses do not accept commercial veterinary medicine, because it is a practice far away from their culture and traditions (they would not have the money to buy the drugs anyway). They know precisely what kind of plants, combination of herbs and/or rituals to use for a number of common diseases of sheep. They have a comprehensive understanding of how animals get sick and what the chances are for a particular animal to get well again.

Our initial interaction with Sabaxan and other Tzotzil shepherdesses led us to develop a project concerning indigenous knowledge on health practices within Indian-managed flocks. As a result, we have learnt a great deal from these illiterate women with their small flocks (12 sheep).

From folk to science

Over centuries, Indian shepherdesses have developed an incredibly rich empirical knowledge about sheep, including management aspects such as identification, housing, handling, feeding, health and reproduction. The sheep are

surrounded with magic, and incorporated into the Tzotzil people's cosmic view. As sheep are sacred animals that share their souls with some unidentified human beings, they must never be killed nor eaten, but rather cared for and respected as any other member of the family. They are even given their own names.

To learn about sheep healthcare by the Tzotzil, we first gathered information on herbal treatment of disease, through long and informal interviews and participatory observation with Sabaxan and numerous other shepherdesses. We also followed the flocks and collected those plants which, as we were told, either cured or caused disease.

We obtained the women's descriptions of the most common diseases in sheep, as well as lists of plants and rituals used to treat sick animals. When we "translated" this information into a veterinary format, we realised that Indian shepherdesses can describe the name and causes (natural or supernatural) of several sheep diseases, as well as how they take their course, and specific herbal and/or ritual treatments.

We then tested the effectiveness of some of the herbal treatments scientifically. We evaluated a series of plants prescribed by Indian shepherdesses against "digestive disorders" in their sheep, which we had already determined were associated with parasitic infection, a major problem in Indian-managed herds.

Working closely together with Indian women from different hamlets, we set up an evaluation trial to try to find the best combination of plants and the most effective dose and frequency of treatment. In four flocks representative of Indian management, the most commonly prescribed plants - garlic (*Allium sativum*), Mexican tea epazote (*Teloxys ambrosioides*) and squash (*Cucurbita maxima*) were tested at three different dose levels and frequencies. Ingredients were collected, prepared by mashing and boiling in water (decoction) and then administered orally to the animals by the shepherdesses themselves.

Labs prove the women right

Our literature review had already revealed that the plants prescribed by the shepherdesses are well-known for their curative properties. The leaves of *k'ux peul* used by Sabaxan to treat her neighbors' ram have several active ingredients against swelling, surface wounds and ulcers. The plants we included in the clinical trials had also been reported to be effective against gastrointestinal parasites in humans.

The knowledge of Indian shepherdesses, based on close observation of animals and on oral transmission of experience from one generation to the next, proved to be effective. Sprigs of *Teloxys ambrosioides* and mashed garlic cloves given orally to sheep that, according to the Indian classification, are affected by

Animal healthcare by Indian shepherdesses Plants and prayers



You have to know how to do it. Sabaxan, a Tzotzil shepherdess, preparing her herbal medicine for sheep.

"stomach ache" and diarrhea, significantly reduced the number of eggs of gastrointestinal nematodes and oocysts of *Eimeria* spp within one week after treatment.

Results from the laboratory only confirmed what many Indian women already knew from first-hand experience. What we can technically describe as a clinical reduction in the number of eggs after treatment, shepherdesses simply understand as the improvement of animals affected from "digestive disorders", due to a good choice of a herbal treatment and to the blessing of St John the Baptist, guardian of all woolly souls.

Extending folk remedies

Not every Indian shepherdess has a comprehensive understanding of herbal medicine for sheep. We obtained a fairly complete picture of herbal and ritual treatment for sick animals only after a large number of informal interviews with Tzotzil women. This gives us a good opportunity to improve the health status in Indian-managed herds by using appropriate extension methods designed to reach as many shepherdesses as possible.

We know that herbal treatments do not totally eliminate the parasite burdens of sheep. However, these remedies cost almost nothing, are culturally accepted by the Tzotzil women and, if properly used, we expect that they can efficiently control gastrointestinal parasites.

Research is underway to test some other Indian remedies for sheep maladies that we can clinically translate as: liver-fluke infection, lung worm, bot fly and a few external parasites such as lice and *Melophagus ovinus*. In the end, we hope to come up with an antiparasite calendar based on regular use of plants and supported by appropriate ritual practices.

The sustainability of a health programme based on herbal remedies and rituals is potentially high in this region, because it fits into the cultural context of the Tzotzil women, is based on their practical knowledge, is very inexpensive and, above all, is culturally sound. And it could be easily applied within traditionally-managed herds by the shepherdesses themselves.

References

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Do-it-yourself vet services



Animal husbandry systems are changing fast in many countries, and traditional treatments often cannot be adapted fast enough to new circumstances. Modern vets may have effective treatments but transport problems often prevent them from reaching the farmers. John Young shows how community-based veterinary services can bridge the gap.

John Young

If asked about their biggest problems with animals, most livestock-keepers will say disease. This does not necessarily mean that diseases cause the biggest losses in productivity, or that coping with disease takes up the most time or money. It simply means that, when an animal is sick, the farmer has to do something, or runs the risk of losing the animal.

In most cultures with a long history of livestock-keeping, there is a wealth of knowledge about herbal medicines and other treatments for common diseases. However, the rush toward modernisation and formal education encourages people to discard their traditional medicines and rely on modern doctors and drugs.

Furthermore, population growth and the need to produce more food from the same land area and sometimes the introduction of new high-producing breeds of livestock are forcing people to change their animal husbandry practices. This may also increase the incidence of unfamiliar diseases.

In this rapidly changing situation, traditional methods of animal healthcare can-

not be adapted fast enough to cope. But, in most developing countries, veterinarians are few and far between, and transport problems limit the area that one vet can cover. The modern sector may have some effective methods, but lacks the infrastructure to "deliver the goods". This situation may be further exacerbated by political instability and, in many countries, by war.

Furthermore, highly qualified vets are expensive and, even in developed countries, it may cost more to bring in a vet than can be earned from the animal - if it gets better. As modern drugs for common diseases are often easy to administer and as many livestock-keepers can recognise symptoms of common diseases, one way of overcoming the infrastructural constraint of veterinary services may be to set up community-based services.

Village vets

In community-based veterinary care, local livestock-keepers provide their own basic veterinary services. They are trained to recognise and treat common diseases using modern and traditional medicines. They may be called Village Animal Health Workers, Village Vets or Para-Vets. Sometimes, they only treat their own ani-