



Camelids are best suited to the conditions of the Andean highlands. Photo: AIGACAA

# Improving llama production in Bolivia

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For over 6000 years the South American camelids have been a distinctive feature of the Andes region, both physically and culturally. Of the four existing camelid species, two have been domesticated: the llama and the alpaca. With the arrival of the Spaniards, these native animals and their breeders were forced to retreat to the highlands of the Altiplano.

Bolivia is the country with the largest number of llamas in the world. Almost all of the two million animals are bred in small family herds, grazing exclusively on wild pastures. The llamas are part of the life strategy of these poor peasant families; they are a means of transport, they provide meat, their manure is used as fertiliser and fuel, and their wool for garments and similar articles.

Llamas are intimately connected to the culture and cosmovision of the Andean indigenous people and play a central role in many of their rites and celebrations. For example, when a couple gets married, they receive several llamas from their parents, depending on the number owned by the parents. This inheritance is then carefully administered by the newlyweds. The common ritual known as *Rhuthucha* - 'first haircut' - takes place around the age of two; on this occasion, too, the child receives a couple of llamas from his or her godfather, as well as parents and other relatives. Although the parents take care of the animals, from that moment onwards the child has his or her initial asset called the *lacama*.

## A llama breeding family

Señor Pánfilo Gerónimo is 55 years old and lives with his wife Damascena in the community la Rivera of the Oruro department. The couple has 6 children, some of them are still in school, and the others have migrated temporarily to work in Chile. The mountainous region where the family lives is situated at 3,800 m above sea level; its climate is harsh with frequent frosts. A small part of their land is used for crops, such as potatoes, *quinua* (local grain), barley and oats, while the rest is used for grazing.

Don Pánfilo explains, "We have 180 llamas and 30 sheep. The whole family takes care of them, taking turns with herding. The sheep graze elsewhere and my wife takes care of them; we also have 5 donkeys. All decisions about the llamas or the sheep are taken together with my wife. We breed llamas to have meat ourselves, and also to sell at the Pisiga fair, some 40 km from

here. The male llamas are also used as packers. The sheep are for our own consumption. We use the manure of the llamas and the sheep as fertiliser in the fields and sometimes as fuel for cooking."

The family has learnt the art of breeding llamas from their parents and grandparents. They keep many traditions, such as the Wilancha ritual, alive. Don Pánfilo explains, "This ceremony is performed to plead for the well being of the families, when a new task is undertaken, or in the hope of a good year for the animals. During the ritual a llama or a sheep is slaughtered at dawn. Blood is shed for the Pachamama (Mother Earth) and for the work that is about to be started. The meat of the animal is then cooked and all present are invited to the meal."

## Limitations

Over the past decades, the tendency has been to reduce the size of the family-owned llama herds in Bolivia. In the areas where camelids were predominant, people started to combine them with, or give priority to other species, particularly sheep. Economically, the main function of the llamas - transportation - was being taken over by engine-driven vehicles, while at the same time the prices of llama meat and wool were particularly low, due to the low quality of these products.

Llama wool is inferior to that of the alpaca as it contains a great deal of low-quality bristles. Therefore, in many areas, only 20% of the animals are sheared each year. Llama meat is consumed either fresh or as *charque* (sun dried). The sale of fresh meat is limited and the prices are very low due to the presence of grain-like cysts of the parasite *Sarcocystis aucheniae* and *S. lamacanis*. Though this parasite does not pose a danger to human consumers, meat with a high degree of infestation is often confiscated. Therefore, it is usually sold through informal channels. The incidence of the parasite, which is transmitted by dogs, is approximately 90% in animals older than 2 years.

Other factors that limit llama husbandry are the degradation of the pastures, the lack of labour, external parasites, lack of shelter, and the degeneration of the animals due to inbreeding. Mortality rates are high, both in adults and offspring. Another problem is the lingering influence of the traditional authorities, which used to regulate the use of the communal pasture areas. All this, plus the fact that breeding takes place almost exclusively in areas of extreme poverty, has increased the cultural prejudices and lowered the status of breeding llamas.

## Economic and ecological potential

Despite these limitations the llama is the species of highest potential in the Bolivian highlands, which explains why families have continued breeding it. On the one hand, the highlands comprise huge areas of natural pastures, especially suited to camelids. They are best adapted to this environment, being highly resistant to the effects of the altitude and climate, and – unlike sheep, goats and cattle – do not disturb the fragile ecosystem of the Andean mountains when they walk and graze. As such, the camelids play a fundamental role in recovering the large areas of degraded pastures.

Furthermore, as long as Sarcocystosis is kept under control, camelid meat is excellent for consumption, with lower levels of cholesterol and fat than beef, pork or lamb. It is possible to reduce the mortality rate of the animals by controlling external parasites, improving shelter and nutrition; better quality wool – comparable to the alpaca – can be achieved by selective breeding programmes. Other potentials include the families' experience in llama breeding and their knowledge of wool processing – both of the fabric (the women) and of the loom (the men) – and other artisan products.

## ASAR

ASAR (Asociación de Servicios Artesanales y Rurales) is an NGO, which has since 1995 been developing programmes for improving llama husbandry in 6 provinces of the Oruro and Cochabamba departments. After analysing the potential and limitations of llama breeding, they have worked towards organising the llama farmers, training them and letting them have a voice in the strategies of the project. In the training of livestock para-technicians, two participants were elected by each community. The methodology was directed at illiterate adults with a great deal of practical knowledge.

After several courses in organisation, llama breeding, transformation and commercialisation of products, the association ARPROCA (Regional Association of Camelid Producers) was established, drawing together the communities from the Litoral, Atahuallpa and Mejillones provinces. It managed to generate funds from UNEPCA (Executive Unit of Camelid Projects) in 1995. These funds were used as credit for the members of the association to buy selected llamas and to establish a special llama-slaughterhouse in Huachacalla to commercialise the venture.

## Quality improvement and marketing of meat

In September 1997, this abattoir for camelids was ritually opened by the communities. Subsequently, courses on slaughtering and the preparation of dried meat were given. Several small solar drying units were built in the communities, to produce high quality *charque*. Once the abattoir was opened, it was also possible to collect data on the slaughtered animals, and monitor the effect of the actions taken to reduce the incidence of sarcocystosis, by controlling the incidence of infestation in the dogs (periodic deworming) and by strategic grazing strategies. Between 1997 and 2000, sarcocystosis in animals older than 2 years has been reduced from 90% to 54%. Thanks to these efforts, good quality fresh and dried meat is now sold in the established meat stores, and the producers fetch a better price. In the year 2000, ARPROCA was able to sell 35,687 kg of fresh meat and 480 kg of *charque* in local and regional markets. Likewise, a network of 12 veterinary community animal health workers has been trained to provide basic veterinary help to the families in the ARPROCA area. This has made it possible for families to increase the weight of their animals. The family income for each llama sold has increased by US\$ 9.65 per adult animal and US\$ 8.76 per young animal, between 1997 and 2000.

## Llama wool and its market

Some llamas have high quality wool similar to alpacas. In the area of Calientes, a breeding programme for the genetic improvement of llamas was started in coordination with the Universities of San Simón, Bolivia, and Hohenheim in Germany. Groups of llamas were selected according to their wool or meat producing qualities, and three breeding centres of the ARPROCA now stimulate controlled breeding in the family herds, for either meat or wool production.

In December 1997, 23 people from 14 different communities belonging to ARPROCA were trained in classification, selection and spinning of the wool, and the weaving of carpets and fabrics. Currently, the crafts centre in Huachacalla employs 8 women and one man. The annual production of this centre is eight carpets of 3 x 2 m., 48 rugs, 200 m of woven cloth, 24 sweaters and 12 ponchos. Private companies, such as SARTAWI, COPROCA and LLAMACTIVA, pay the llama breeding families a good price for the wool as they have found international markets for these products.

## Not marginal anymore

Thanks to these new possibilities in management and markets, the breeding of llamas in these areas has ceased to be a marginal



Women working with llama wool at the crafts centre in Huachacalla. Photo: ARPROCA

activity. The families are now trying to increase the size of their llama herds, not only for cultural and ecological reasons, but also for the socio-economic advantages. Don Pánfilo explains: *“Earlier, it was difficult. Each year I could sell some 20 llamas of different ages at the fair. Each llama gave us about 30 kg of meat, 5 bolivianos per kg. Sometimes they didn't want to take it because of the arrocillo (Sarcocystosis). With the money I would buy groceries and bread to take home. I didn't sell the wool or the leather, because there weren't any buyers. Now, fortunately, the situation has changed. There is less arrocillo, the llamas are heavier and we can sell the meat at a better price. Also LLAMACTIVA buys our wool at a good price to export it to Peru. They also buy our leather as they have also found a market for this product. With all this we are certainly better off now than before!”*

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More information in *“Gracias a los animales: la crianza pecuaria familiar en América latina con estudios de caso de los valles y el Altiplano de Bolivia”*. Edited by Agruco, Cochabamba, Bolivia. Forthcoming. Katrien van't Hooft, editor.