



# Pastoral wo

they try to solve their problems were not directly incorporated into the research.

The exotic forages were disappointing. They suffered from the low annual rainfall (500-600 mm, with somewhat longer rains in April-June and short rains in October) and cool temperatures (19°-24°C) on the Borana Plateau, which ranges from 1000 to 1600 m in elevation. Some fodder trees which initially performed adequately were later killed off by termites and other pests.

A partnership between ILCA and the nongovernmental organisation CARE-Ethiopia helped change this orientation. Through their grassroots interactions, the CARE staff were able to gain insights into the local people's priority problems, on which ILCA could then focus its research. The daily lives of the pastoralists were far more complicated than the researchers had imagined. The priorities of the pastoralists had more to do with solving problems of labour and access to water and other resources, than with animal production itself. Calf management was a smaller issue nested within these larger problems.

The interactions between ILCA, CARE and the Boran increased the awareness that preparing and storing range vegetation for dry-season feeding was a key issue in improved calf management. In the past, the Boran had probably not thought of making hay because they used to be more mobile. Pastoralists who move their herds seasonally cannot take haystacks with them. In view of the recent changes in conditions for livestock-keeping, the Boran are open to practices that would have been less appropriate only a generation ago.

## Better calf nutrition

Haymaking was first introduced by CARE extension staff in one central region in 1989, and raised considerable enthusiasm among the Boran. There were also efforts to promote locally-built water cisterns to catch run-off and provide an additional dry-season water source for both people and calves. Hundreds of households were initially affected by these innovations, which were expected primarily to improve human welfare by reducing women's workload at critical times of the year.

However, studies of their actual effect suggest that the greatest benefit was in terms of improved calf nutrition. The total labour inputs of the married women who, among many other things, also care for the calves were not as great as had first been thought.

The Borana women cut and dried local grasses such as *Cenchrus*, *Chloris* and *Pennisetum* species in June, near the end of the long rains, for use as hay in the

**Improved calf feeding can enhance animal production, as shown by Borana pastoralists in southern Ethiopia. Exotic inputs are not needed; instead, native grasses and legumes can be used more effectively by harvesting some for later use. Borana women, who are traditionally responsible for managing calves, have been trying out such new techniques.**

### Layne Coppock

**P**eople and calves compete for milk in pastoral systems. Especially in poorer households with few cows, taking more milk for humans and leaving less milk for the calves can stunt the animals' early growth and increase the risk of calf mortality. Loss of calves makes the family even poorer.

Despite major economic changes in Africa, livestock production will remain the main engine of the livelihood systems in semiarid areas such as Borana. The goals of development must include sustainable improvements in animal husbandry to improve human welfare. To reduce risks of calf mortality, better feeding is often proposed. But do the seasonal fluctuations in plant growth, the often high stocking rates and the existing labour demands present major barriers to implementing such practices?

### Traditions and change

The Boran keep suckling calves in or near the family hut until they are strong enough to join calf herds that graze close to the camps. The married women traditionally supplement the calf diet with cut-and-carried native grasses and water hauled from wells and springs.

The pastoral system is changing under the pressure of human population growth, loss of land and growth of local town markets. The Boran are becoming more settled. Their cattle are producing less and

less milk from an increasingly restricted resource base. Although cereal cropping by the Boran is increasing, they also buy grain on markets. To obtain cash for this, many families living near towns prefer to sell milk rather than animals, which would dig into their herd capital. Increased milk sales are at the expense of milk intake by calves. The present pressures are stimulating the Boran to consider new ways of doing things.

The Boran are innovative. Over 90% of their camps now have *kalo*, or dry-season fodder reserves for calves and other less mobile stock. The *kalo* vary greatly in size and may contain valuable native leguminous trees such as pod-bearing acacias. *Kalo* appear to have become widespread in less than 20 years, which is unusually fast for an agricultural innovation in a rangeland setting. Some Boran have also been experimenting with different grazing rotations near their camps, where more cattle must be supported because access to more distant pastures has been lost.

### Joint research in calf feeding

When scientists at ILCA (International Livestock Centre for Africa) began to investigate calf management and forage interventions in the early 1980s, conventional top-down research approaches were still used. Exotic legumes and trees were screened for their biological suitability. Ideas from the pastoralists as to how

# men harvest hay for calves

warm dry season after the short rains. The grass was air-dried, and the women were trained how to stack it. Some households made 200-300 kg of hay, which is enough to supplement the diet of 5-6 calves through the dry season.

Analyses showed that the hay from local grasses was very suitable for improving calf nutrition in terms of protein content and digestibility. It had considerably higher nutritional value than the brown grasses which the women traditionally cut and fed to calves in dry periods. The Boran recognised this difference in terms of the continued greenness of the dried hay compared with the standing grass.

## Add water and acacia

In many cases, the grass hay is all that is needed to improve dry-season calf nutrition. Sometimes, however, extra water may be needed to increase the calves' hay intake, and *Acacia tortilis* pods can provide extra protein. When water is available from cisterns, studies showed that the Boran prefer to give the extra water to the calves.

Although acacia pods are very nutritious for animals, it is difficult to gather enough pods if the family is not lucky enough to live near large, productive trees. Using native forage legumes to supplement the grass hay may be attractive to such families. But it is the presence of the base of grass hay that allows effective use to be made of small amounts of forage legumes. This illustrates the interdependency of innovations.

## To hay or not to hay?

Observations and interviews among the Boran revealed that the women had ample time to make hay during the late wet season, and that all family members contributed some labour to this task. Thus, the amount and timing of labour did not seem to be a problem.

The Boran saw the following problems with haymaking:

- If the short rains in October are unusually good, the hay can become moist and spoil if it is not properly stacked.
- If households have to move, hay has to be left behind and is thus wasted.

The first problem could be solved by training in drying and stacking hay. The second problem would be serious for only a few families. A poor long wet season is probably the main reason for moving later in the year. As hay is made near the end of the long rains, families already know by then whether a move is likely and can decide whether it will be worthwhile to make hay that year.

## Woman-to-woman extension

The research and development experiences thus far show that considerable improvements in calf management are possible even with increasing pressure on resources. New and simple ideas that improve the use of local resources which are already appreciated by the Boran seem to work best. It is unlikely that top-down research with exotic technology could offer as suitable a solution so quickly.

Socioeconomic features of haymaking are also attractive to the Boran. Haymaking transforms a communal grazing resource into a private one in the form of a stack behind the hut. The benefits of haymaking in terms of yield and calf survival directly reflect inputs of time and effort invested. Hay is a highly visual innovation. Producers can see the impact quickly. In contrast, exotic forages intended to improve pasture quality in communal grazing areas are less attractive, especially if the biological performance is anything less than outstanding.

Another advantage of haymaking is that it needs next to no external inputs and the women can teach each other how to do it. This allows them to be relatively independent of an understaffed and underfunded extension service and an almost nonexistent farm supply service. Unless social values change, or the women take on heavier workloads in the future during the latter part of the long rains, haymaking should spread quickly in Borana mainly through woman-to-woman extension.

We had hoped to observe the spread of haymaking among the Boran, but regional insecurity came with the change in the central Ethiopian government in 1991. There are now plans to continue work in system analysis and pastoral development in Borana. Knowledge of precisely where and when haymaking was introduced will provide a measuring stick to assess rates of diffusion of this innovation in years to come.

## References

- Coppock DL. 1991. **Hay making by pastoral women for improved calf management in Ethiopia: labor requirements, opportunity costs, and feasibility of intervention.** *Journal for Farming Systems Research-Extension* 2 (3): 51-68.
- Coppock DL. 1993. **Grass hay and Acacia fruits: a local feeding system for improved calf performance in Ethiopia.** *Tropical Animal Health and Production* 25: 41-9.
- Hodgson RJ. 1990. **The Southern Sidamo Rangeland Project 1985-88: perspectives on development interventions and extension.** Unpubl. report, CARE-Ethiopia, PO Box 4710, Addis Ababa, Ethiopia.
- Holden SJ, Coppock, DL & Mulugeta Assefa. 1991. **Pastoral dairy marketing and household wealth interactions and their implications for calves and humans in Ethiopia.** *Human Ecology* 19 (1): 35-59.
- Menwyelet Atsedu. 1990. **Ecology of calf pastures and supplemental feeding by Borana pastoralists of southern Ethiopia.** Master's thesis, Colorado State University, Fort Collins, Colorado, USA.
- Mulugeta Assefa. 1990. **Borana cattle herds: productivity, constraints, and possible interventions.** Master's thesis, Colorado State University, Fort Collins, Colorado, USA.

D Layne Coppock, Dept of Range Science, Utah State University, Logan, Utah 84322-5230, USA



The calves are kept inside the house. The hay supplements can easily be hung from the wicker walls.