Chapter Four
Overview of the key elements of the pastoral knowledge systems of the Beni-Amer

The importance of crossbreeding practices

Pedigree herding and careful bull selection are vital components of any breeding system and the Beni-Amer confidently understand them. In this section, a brief evaluation of Beni-Amer crossbreeding concepts will show how they manipulate breeding to achieve specific objectives. Pedigree herding and crossbreeding for such reasons as adaptation, productivity, security and aesthetic qualities have always been part of the Beni-Amer breeding system. Crossbreeding with other, non Beni-Amer, cattle breeds has had increased importance in recent decades. Most of the Beni-Amer interviewed spoke of introducing a new bull and new blood to a herd in order to describe the crossbreeding practice, or what is known as kryet-uhr. Table 4.1 summarises the rationale behind the present crossbreeding in relation to the two breeds involved: the Dwehin of Sudan and the Bulad/Bgait of Eritrea.

Table 4.1 clearly indicates that the Beni-Amer cattle owners have a holistic, resilient and pluralistic approach to breeding, which includes aesthetic, genotypic and phenotypic characteristics, all of which were mentioned earlier. Docility and a cool heart relate to the animal’s favourable character and its ability to obey its owner, so this would be in the realm of animal behaviour. Coat colour reflects the Beni-Amer’s preference for black-and-white spotted animals, and polled (trimmed) or short horns also reflect their aesthetic sensibility. Traditionally, the Beni-Amer preferred high-milking breeds (genotype), but since the 1960s they have sacrificed this trait by breeding less productive animals with ones that possess a high sensitivity to outsiders (in order to deter cattle raiders and other intruders). From the Beni-Amer perspective, crossbreeding with
Dwehin bulls has resulted in less than ideal offspring, but is a necessary adaptation for them to survive in hostile conditions (phenotype).

The Beni-Amer, like any good breeder, would like the offspring to possess a combination of the best characteristics from both breeds. After crossing their cattle with the Sudanese Dwehin bulls for about three decades, the Beni-Amer claim they have achieved their prime objective of breeding less productive animals with high sensitivity to cattle raiders and other intruders (Fre 1991). One can assume, therefore, that the Bulad/Bgait were more productive, much aspired to and preferred by Beni-Amer herders, and in an ideal situation (no conflict, no risk of intruders), they would breed Bgait bulls with Bgait cows to maximise productivity and ensure characteristic cool-heartedness (docile with less fight and flight behaviour).

Another landmark in the evolution of Beni-Amer breeding practices is the crossbreeding (in the early 1970s and the 1980s) of the Dwehin bull of Sudan with the Eritrean Bulad/Bgait cow for a deliberate hybrid vigour. The Beni-Amer speak metaphorically of cool heart (meaning slow and less aggressive) and fast heart (meaning aggressive), and they have opted for the latter because of the vulnerability of their cattle to raiders and aggressive commercial farmers. They have employed this genetic breed manipulation by crossing a homozygous recessive Bgait cow with a Dwehin bull to obtain first generation (F1) heifers with genetic or hybrid vigour, which they refer to as fight and flight or aggressive, and a tendency to fight off intruders. Having this particular attribute among their cattle

Table 4.1 Characteristics of two indigenous breeds

| Dwehin bull (Sudanese) | Bulad cow (Eritrean) |
|------------------------|---------------------|
| Aggressive, wild character | Comparatively docile |
| Lower milk yield | High milking potential |
| Comparatively small | Large-framed and good walkability |
| Warm-hearted | Cool, slow heart |
| Short horns | Short horns |
| High disease resistance (phenotypic advantage) | Lowland type unsuited for heavy clay soils (phenotypic disadvantage) |
| Less colour dominance but generally black | Predominantly black-white spots with some brown-red |

*Source: Information from Beni-Amer in the study area, reported in Fre and Tsegay 2016*
is becoming increasingly important in the light of mounting pressure on land and resources, and the resultant conflicts, such as land grabbing and cattle raiding.

The Beni-Amer cattle are traditionally black-and-white spotted, whereas Dwehin are predominantly black, but because of the Dwehin influence, the Beni-Amer cattle have become blacker. After decades of crossbreeding in a new environment, the Beni-Amer are herding a second generation of cattle bred with objective precision, and this is likely to continue as cattle numbers increase. Genetically, however, the productive characteristics of the Bgait will eventually be suppressed.

This new breeding practice (Dwehin × Bgait) has emerged out of necessity as the cattle herders were forced by hostile circumstances (cattle raiders) to breed new blood. The experiment has worked for more than three decades, clearly demonstrating the ability of the Beni-Amer to manipulate traits in cattle through selective breeding. The Beni-Amer’s awareness of the techno-social implications of their new breeding strategies was also assessed during the research.

Firstly, they said that Dwehin × Bulad crosses have fight and flight tendencies as intended, but are less productive than the original Bgait cattle. In other words, they see the recent crossbreeding exercise as a genetic degradation, and, in order to emphasise the new Sudanese blood, they call the present crossbreeds Aha-Dwehin (Dwehin cattle) instead of the more traditional name, Aha-Bgait (Bgait cattle).

Secondly, the Dwehin crosses are difficult to handle because of their wilder tendencies, and they require a larger labour force for herding. They prefer to have the same herder or herders all the time, they are sensitive to and violent towards outsiders, and they are difficult to handle in marketplaces.

Thirdly, the new crossbreeding has socio-cultural implications. Beni-Amer culture adores the Bgait as productive, gentle, docile, and truly born and bred Beni-Amer, but the Dwehin × Bgait crosses of the present generation are seen as alien blood, as they do not fit into the traditional cattle cultural context.

Fourthly, decades of drought in the region and displacement (due to past wars) of pastoralists from their homes, ranging from western Eritrea to eastern Sudan, have made some Beni-Amer less specialised in cattle production. So, rather than crossing Dwehin with Bgait, they have opted for multi-species herding (for example goats, sheep and camels); this deviation from tradition is by necessity rather than by choice.

Genetics, in general, is a very complicated subject and what has been evaluated in this chapter is open to further research, but in terms
of the resilience of indigenous knowledge, the evaluation shows that the Beni-Amer know the benefits of crossbreeding and are aware of the technical and socio-cultural implications of their actions. They are clearly able to manipulate animal character through careful bull selection and crossbreeding to suit their situation, and this encourages hybrid vigour.

**Herd composition and managing productive herds**

The discussion in the earlier part of this chapter has shown that cattle bred by the Beni-Amer have good genetic qualities in terms of milk production and environmental adaptation, but the Beni-Amer traditional breeding objective is primarily to produce a productive *female herd*. I observed that herds are 90 per cent composed of productive or potentially productive females; this has also been seen by Gedamu et al. (1984), who report that 93 per cent of Beni-Amer herds observed consisted of females. The Ethiopian Institute of Agricultural Research (EIAR), which can be called a hybrid institution, states that the Beni-Amer are much better at keeping productive cattle than other pastoral groups in East Africa.

Beni-Amer herds are composed of separate milking or *Hlb* and non-milking or *Nesuf* herds. A typical Beni-Amer herd consists of 60 to 100 adult animals, but the age and composition of dry and milking herds vary greatly. The cattle in both cases have to be productive or potentially productive, and there is no evidence to suggest that the Beni-Amer keep unproductive animals.

In my observation of more than 100 dry herds in the study area, I noticed striking similarities in terms of herd composition and structure. A typical dry Beni-Amer herd consists mostly (60 per cent) of heifers or *felayit*, which are categorised within the herd as *nu-ush ighra* or light-footed. Slightly more than 35 per cent within the herd are *bu-krt* or adult cows (after 2 or 3 calvings) and the leader cow or *merahit* is selected from this group (such a cow will have a bell hanging from her neck and she leads the herd). In terms of male–female ratio, it is common to find only two or three bulls per herd of 100 animals. The herds also consist of a very small number (less than 5 per cent) of old cows categorised as *ghedob*, which are kept mainly for sentimental reasons, such as being of the pedigree. According to tradition, such cattle will not be slaughtered, but will be the first to be sold in times of need or crisis.

The culling of males stems from the management objective of the Beni-Amer, who perceive the herds as female and bred to produce milk,
but there are new trends among settled Beni-Amer and more male calves are being reared for the local and regional markets.

Since the 1960s, faced with environmental degradation, agricultural encroachment, cattle raiders and civil conflict in some parts of the Horn region, the Beni-Amer have opted for multi-species herding, a phenomenon which is not yet well studied (Fre 2008). This is also a clear indication that the pastoral system is resilient and can adapt to the prevailing conditions, whatever they may be.

The degree to which the Beni-Amer are moving away from cattle herding to other means of subsistence, such as multi-species herding and wage labour, may be significant, but observations of their herd composition show that the Beni-Amer are still pastoral and cattle-oriented at heart. The Beni-Amer continue to be renowned for their cattle specialisation and, as mentioned, consider themselves to be Seb-Aha, or ‘men of cattle’ (Fre 2009a).

The Beni-Amer attach great importance to ruminal adaptation and they breed a variety of animals whose digestive systems are suited to different environments. Such specific breed traits are not confined to

### Table 4.2 Herd structure among settled cattle owners in eastern Sudan

| Herd composition | % |
|------------------|---|
| Milking cows     | 70 |
| Heifers          | 18 |
| In-calf cows/heifers | 5  |
| Male calves (11 months +) | 2  |
| Female calves (9 months +) | 5  |
| Total            | 100 |

*Source: Author’s fieldwork 2011*

### Table 4.3 Herd structure among migrant herds in dry-season grazing areas along the River Tekeze on the Sudan–Ethiopia border

| Herd composition | % |
|------------------|---|
| Adult heifers    | 60 |
| Adult cows       | 35 |
| Old cows         | 5  |
| Total            | 100 |

*Source: Author’s fieldwork 2011*
the Beni-Amer, as they are adapted through crossbreeding with stock belonging to other ethnic groups or tribes, both in the Ethiopia–Eritrea highlands and in lowland habitats. Several other non-Beni-Amer ethnic groups have used the Bgait as pedigree or sometimes crossbred them with their own hill-type or Arado animals. As mentioned before, dairy units in major towns in Eritrea, as well as in eastern Sudan, use better-fed Bgait breeds or crosses for intensive milk production for the urban and peri-urban population.

Further analysis of the Beni-Amer management systems shows that calf drop is seasonally controlled and geared to coincide with the rainy and harvest seasons when grass, water and fodder are in good supply. The basic principle is that if animals were calved during the dry season, their body condition would deteriorate because of physiological stress. Thus, dry-season calf drop is unwelcome because the scarcity of water and forage coupled with milking pressure can lead to weight loss and other physical stress. Calf drop also coincides with the movement of pastoralists northward. From the wet clays and fly-infested areas in the south to higher, drier ground in the north, herders move closer to their home base after being away for about six months.

The Beni-Amer consciously encourage milk let-down through udder massage, chanting the cow’s name during milking, having the same milker, and night milking when temperatures are cooler. In the case of a dead calf, dried skin or a dummy calf smeared with milk is given to the cow to lick. All of these actions reflect the belief that a cow will only fully release her milk when she is relaxed and not tense. The same concept is applied in European dairy units, where music is played during milking and concentrated feed cake is supplied in order to encourage more milk let-down. During the 1980s, I worked in British commercial dairy farms as a trainee agriculturalist and witnessed music being played in the milking parlour.

The Beni-Amer ensure good husbandry by providing coarse salt, or grazing land with higher salt content, salty browse, night grazing to reduce animal stress caused by excessive daytime heat, and crop fodder, and avoiding dirty or swampy water as far as possible. The timing, amount and frequency of salt provision very much depend on salt availability and the season. The Beni-Amer believe that salt has nutritive and curative values and increases appetite, as well as being an essential dietary requirement, while dairy herders in western Europe and the United States see salt as an essential mineral, with only nutritive rather than curative value. Rock salt is often put in the field to supply supplementary sodium and chlorine; other minerals such as calcium,
phosphorus, iron, potassium and sulphur are blended as mineral mixtures for different classes of livestock (Boatfield 1979).

Night grazing (6 pm–5 am) during the dry season is another tradition well established among the Beni-Amer as an essential husbandry practice; it is perceived by the Beni-Amer as a way of escaping the intense daytime heat of up to 40°C in the dry season. Animals are likely to lose less energy by grazing at night (when the temperature is lower) as their body temperature varies according to the atmospheric temperature. Night grazing also reduces the amount of water needed by the animal and the loss of water through perspiration, and so a lot of energy is saved, which in turn, positively affects body weight, this being the prime concern of the Beni-Amer, particularly during the dry season.

At the height of the dry season (March–June), cattle rest under trees for most of the day and graze at night. The timing and frequency of night grazing is very much influenced by the season, the nature of the herd (milking or dry), the extent of agricultural encroachment and security from cattle raiders.

In high-potential farming areas, where agricultural encroachment is intense, milking herds are confined to the hilly areas and homesteads. During the rainy season, low-lying clay areas become infested with biting flies, which irritate cattle during day grazing; as a result, herders practice night grazing to mitigate the fly hazard, since biting flies are less active at night. Ideally, there should be less need for night grazing during the rainy season because of the abundance of grass and cooler daytime temperatures, but in practice night grazing has become a year-round activity.

Over the last five decades, the dependence of livestock on crop fodder as a subsistence ration has become crucial to good husbandry, especially in eastern Sudan. Crop fodder, particularly sorghum, has become a source of cooperation between herders and farmers, as well as one of conflict. In the study area over the last decades, farmer–herder conflicts have escalated and sorghum fodder has become a source of conflict rather than cooperation, particularly in the Gedaref district of eastern Sudan and the Gash-Setit area of western Eritrea (Sulieman and Ahmed 2013; Fre 1991). These are agriculturally and pastorally the most important areas for which competition is intense (Fre and Musa 1993). Half of Sudan's sorghum crop and charcoal supply is produced in the Gedaref district. Table 4.4 indicates the importance of crop fodder, not only as a grazing supplement, but also as a substitute for grazing, particularly during the dry season.
It has to be pointed out, however, that these amounts of forage are not always available to the livestock owners, because of remoteness, lack of a water source for the animals or lack of transhumance routes. There is also a big demand for crop fodder in the urban and peri-urban settlements, where a growing peri-urban livestock population needs fodder.

Over the last decades, traditional patterns of movement and the availability of seasonal resources have been greatly disrupted by factors beyond the control of pastoralists; encroachment, cattle raiding, desertification and conflict have become major constraints on good husbandry in the region. Research by Sulieman and Ahmed (2013), Fre (2009b) and Morton (1998) among the neighbouring pastoralists, in eastern Sudan and elsewhere, illustrates the vulnerability of pastoralists in the wider region because their regular dry-season grazing lands and the routes to their rainy-season pastures are being taken by tractorised schemes.

The case of the Beni-Amer is, in fact, very similar to the above, and there is good reason to argue that it is the factors mentioned earlier which limit good husbandry and not the management skills of the pastoralists themselves, as is normally assumed by policy makers. In this case, ensuring land rights and access to pastoralists may be more crucial to pastoralists than other husbandry interventions for developing sustainable pastoralism.

Table 4.4 The scale of forage production in Gedaref district, eastern Sudan

| Scheme                        | Area (feddans)* | Total production (tonnes) |
|-------------------------------|-----------------|--------------------------|
| 1. Planned mechanised schemes  | 1,211,350       | 2,422,700                |
| 2. Unplanned MFS              | 1,669,270       | 3,338,540                |
| 3. African Co. Scheme         | 13,000          | 26,000                   |
| 4. Abuseca Scheme             | 6,000           | 12,000                   |
| 5. State farms                | 12,667          | 25,334                   |
| 6. Canadian Scheme            | 3,800           | 7,600                    |
| 7. Qala-en-Nahal**            | 40,000          | 75,000                   |
| Total                         | 2,956,087       | 5,907,174                |

Sources: MFS (mechanised farming schemes) Khartoum 1992, quoted in El Tayeb (1985); Sulieman and Ahmed (2013).
Notes:
* 1 feddan = 1.04 acres
** Additions by present author
The case for indigenous pastoral knowledge and practice (IPKP) and the relevance of that concept to pastoral development were highlighted in the first chapter. The research on IPKP among the Beni-Amer in this section will focus on specific areas of knowledge and production that have emerged as deserving more detailed explanation. As already stated, the main focus is on pastoral technology that has the following characteristics:

- There are things that can be called common livestock knowledge and practices. Examples are disease nomenclature and symptoms, ethno-botany, the importance of good husbandry, and so on. These are referred to as *kulna-lanaamru*, or *that which we all know*.
- There are specialised knowledge and practices that are possessed by a minority of pastoral or agro-pastoral people within a large community or communities. Such people are referred to as *Seb-lalaamro*, or *people with specialist knowledge*. They perform special duties such as treating fractured and dislocated bones, assisting complicated births (breech presentation), and so on. They can offer services or advice out of the ordinary (i.e., outside common knowledge or practice).
- There are specialised tasks and skills performed and accepted widely by members of the same tribal grouping. In this case, the whole tribe refers to itself by the animal it specialises in. The Beni-Amer, for instance, consider their cattle specialisation as something they have in common and consider themselves as *Seb-Aha*, and such specialisation is recognised and appreciated by neighbouring non-Beni-Amer groups.

It is important to stress, however, that Beni-Amer specialisation is not uniform in terms of management ability and the productivity of various herds. Individual or group management ability influences production, but among the Beni-Amer the herd is perceived as family capital and property, the products of which can be shared with others. Fre (2008) and others argue that the management practices of individual owners are one of the most important factors affecting productivity.

Among the Beni-Amer, however, keeping and managing good, productive and healthy herds is part of tradition, and pastoral knowledge is thus widely shared. But the Beni-Amer may be exposed to different grazing opportunities and risks (e.g. cattle raiders, encroachment by farmers) which are bound to have an effect on herd productivity.
During the field research, pastoralists and agro-pastoralists never complained about the quality and productivity of their cattle breeds. They argued that their breeds were producing less milk because of poor husbandry forced on them by lack of grazing resources. As a move towards improving this situation, the Beni-Amer have proposed and prioritised the following supportive institutional interventions:

- official demarcation and allocation of their grazing lands;
- provision of wells nearer to settlements;
- more access to agricultural land after harvest, limiting the expansion of agriculture to reduce encroachment; and
- severe punishment for cattle raiders and thieves.

Animal production and husbandry

As far as cattle specialisation is concerned, the Beni-Amer who own dry (non-milking) and milking herds possess, as a group, highly specialised skills and underlying perceptions. For instance, breed selection is done purposely to suit given conditions, such as topography, ecology and security. The best bulls are selected from a mother of known genealogy; characteristics such as milk yield, character, colour and mothering ability were traditionally the main criteria for bull selection. At present, they are sacrificing milk yield characteristics by crossing Bgait with the more aggressive Dwehin bull from the Sudan as a deterrent to cattle raiders.

Knowledge of the different breeds of animals is fairly well spread. For example, the origin of the animal, its milking and kidding characteristics, and its adaptability to and suitability for the present environment are known by most herders, and Beni-Amer pastoralists breed for specific purposes such as milking or continued breeding. They keep productive females, which sometimes comprise as much as 90 per cent of a herd, which illustrates this point.

The Beni-Amer thus try to produce productive animals and to enhance the productivity of their cattle by manipulating their physiological capacity and animal behaviour. They encourage milk let-down and yields by massaging the udders of their cattle, chanting the cow’s name, praising the cow during milking, and so on. They provide good management and care by taking cows out for night grazing (when it is cooler, to avoid the day temperature, which is 30–45°C), by seasonal provision of salt, by crop fodder provision, by limiting water consumption during the dry season, and so on. This area of knowledge of pastoral
technology is where the Beni-Amer can make a direct contribution to our scientific knowledge of livestock production.

### Ethno-veterinary knowledge and practice

The various diseases that affect livestock have local names that range from universally descriptive names, such as cattle plague or gulhay (‘shaver’, or rinderpest), to little-known diseases, such as swellings or hbat. The seasonal characteristics of certain diseases caused by biting flies are fairly well known, and in one area I identified more than 30 commonly known livestock diseases. Disease nomenclature in some cases is detailed and some of the causes and symptoms of disease and the general effect on animal health are known. Animal diseases are also placed in four main categories:

- **killer diseases**, referred to as ajel (the predestined day of death), that cannot be stopped, e.g. rinderpest;
- **contagious diseases** (those which are known to be so), or lalhalf, can partly be prevented from spreading, for example by isolation or slaughter;
- **chronic diseases**, or la-ad-ef, that are hard to cure, e.g. caprine pleuropneumonia (CPP); and
- **curable diseases**, or lt-dawe.

Most diseases are not perceived as heavenly punishment, but said to originate from lack of good husbandry. The Beni-Amer attach great importance to good husbandry (mera-senni) as the best protection against diseases; for example, mixing of flocks or herds (hber) is seen as a predisposing factor to disease and a bad husbandry practice.

The distribution of knowledge is even among older people, but is less detailed among younger people, who may or may not be involved in direct herding. However, traditional veterinary practice, unlike common disease knowledge, seems to be confined to a much smaller group of people, described as Seb-lalaamro or people with specialist knowledge, who perform specialised duties. One of their main specialisations is identifying the ailment properly and suggesting a cure or performing on-the-spot treatment; such people are highly respected by the community and are always in demand. In their absence, ordinary pastoralists try to perform the duties themselves, with only partial success. Such traditional medics resent the fact that their work is not recognised by
government veterinarians, who rarely visit them. The traditional medics approve of modern veterinary medicine for dealing with certain diseases such as rinderpest (gulhay) and anthrax (ansa), but they think some of their own methods of treatment (such as fractured bone treatment) are better, and they emphasise the complementarity (or synthesis) of the two practices in improving veterinary care for their animals. The argument in the discussion on ethno-veterinary knowledge and practice will develop in two ways.

Firstly, the several medical and nutritional practices in the systems will be described by close comparison to western veterinary medicine. Such areas include the straightening of fractured bones, the provision of laxatives to bloating animals, the provision of salt, and the treatment of mange by using medicinal plant saps. It will be argued that in such cases intervention should be for the improvement and upgrading, not the replacement, of sound practices.

There are inherent weaknesses in disease prevention and perception even among the knowledgeable traditional medics; the diseases described as unknown (caused by divine act) or put down to ajel (the day of destiny) are simply unidentified. In such areas, traditional medics, if trained, can be the best medium for reaching the pastoral communities.

Ethno-botanic knowledge and traditional land use

Generally, the territory of the Beni-Amer in Eritrea, eastern Sudan and northern Ethiopia consists of mountains and foothills (adbr), coastal areas (sewahil) and vast savannah plains (saiid) in the south. These environments are sufficiently varied to influence the mode of livelihood of the Beni-Amer.

What the Beni-Amer call saiid is an environment characterised by heavy black soils, and these plains are suited to the rearing of the heavy, high-yielding, lowland-type cattle for which the Beni-Amer are well known. In terms of land use, the southern part of the study region becomes heavily infested by biting flies and too muddy for grazing from June until September, so the Beni-Amer take their cattle north to higher ground, which is free of flies and has lighter soils.

The knowledge of ethno-botany among the Beni-Amer pastoralists is not simply botanic, and it contains detailed elements of oral taxonomy. The botanic knowledge is extensive but somewhat localised; such knowledge is closely associated with animal nutrition (utilitarian) and animal health (medicinal) and is used to classify livestock breeds by the ruminal
flora they consume. Much of the ethno-botanic information in this book was collected during the field research and subsequent visits, but it is by no means comprehensive. The ethno-botanic knowledge of the Beni-Amer is to a large extent undocumented, but it may be studied through the lens of disciplines such as geography, ecology and agricultural anthropology. In the present context, ethno-botany is treated superficially and only in relation to animal production and health. Most of the ethno-botanic data is in Annex 1, because the primary focus of the present research is animal production, husbandry and health; *pastoral* ethno-botany is mentioned in general terms.

The older Beni-Amer, the *Fellata Sudanese* (Sudanese of West African origin) and the Beja have shown great skill in classifying the vegetation and providing a historical account of some extinct vegetation. In one case study, a Fellata Sudanese agro-pastoralist was able to provide a full description (location, habitat, use, nutritive value, etc.) of 25 tree and grass species. An old Beni-Amer pastoralist identified 50 tree and grass species within a 45-kilometre-long riverbank.

For plants whose Latin names are not known, their local names will be used in this section, which analyses their growing environment and range use (see Annex 2).

Plant knowledge among the Beni-Amer extends to animal breeds as a means of general ruminal classification and the Beja refer to their camel breeds as *Hib-qualot* or tree eaters, *Aliab-qualot* or grass eaters, and *Shallagait* or eaters of salt marshes along the coast of the Red Sea. The Beni-Amer group their camels into white and red; the white breeds are known as *Abet* (browsers of salty plants) and the red camels as *Radyet* (browsers of sweeter plants).

According to the Beni-Amer, the *Abet* are hardy and better survivors; during the decades of drought, they were better able to survive because they were able to graze on a variety of sweet and salty plants. These plants are *Ubel, Kulmt-Hamta* (unidentified trees with a salty taste) and *serob* (*Capparis decidua*) as well as *ksla* (*Ziziphus spina-Christi*). The *Radyet*, on the other hand, were more accustomed to sweeter plants, which were very few in drought years, and therefore suffered greater death rates.

Beni-Amer ethno-botany consists of botanical ethno-semantics (tree, grass and herb names, including extinct species), utilitarian and medicinal use of plants, ruminal and floral knowledge, and knowledge of range preferences (see Annex 2). The Beni-Amer ethno-botany is detailed enough to form some basis for range improvement and extension work, but there are also inherent weaknesses in the system which should be noted:
the perception that environmental resources, such as trees and grasses, are unlimited; and
the fact that the consequences of a degraded environment for future pastoralists are not fully realised.

This is worsened by ever-increasing agricultural encroachment on traditional grazing territories, which has led to lack of access and control by pastoral groups, including the Beni-Amer. In other words, pastoral groups in the study region may have detailed botanic knowledge but an ever-decreasing land resource base, as mentioned in the previous section, which will be elaborated in Chapter 7.

Beni-Amer traditional range resource control mechanisms are not particularly strong and have been put under external pressure (farming encroachment, insecurity, etc.), and cutting trees for making charcoal and for grazing has become more frequent. According to Beni-Amer custom, grazing land is common to all Beni-Amer, but land use systems are varied and complex and the focus in this book is on the utilitarian and medicinal aspects of traditional ethno-botany among the present study group.

The purpose of this chapter has been to introduce the major components of the present research (animal production, animal husbandry and ethno-veterinary knowledge); ethno-botanic knowledge is treated in a more general pastoral context. The following chapters will deal extensively with three major thematic areas:

- animal production;
- livestock management;
- animal health; and
- the implications for people-oriented technological intervention among the Beni-Amer and other pastoralist communities in Africa.

In the next chapter, I begin with an exploration of the technical aspects of the Beni-Amer’s methods of animal production. From their informal knowledge of pastoral genetics to their intimate knowledge of the breeds themselves and their skill at breed manipulation, it will be shown that the Beni-Amer’s indigenous knowledge and methods are much more systematic and scientific than the scientific community would have you believe.