ANIMAL GENETIC RESOURCES AND HIV/AIDS IN SUB-SAHARAN AFRICA

M.R. Goe¹ and G. Stranzinger¹

¹Institute of Animal Sciences, Swiss Federal Institute of Technology,
Tannenstrasse 1, 8092 Zurich, Switzerland

INTRODUCTION

Recent estimates indicate that livestock form an important component of the livelihoods of at least 70% of the world's poor (Ashley et al., 1999). In sub-Saharan Africa the largest poor group is composed of rural small holders, the majority of whom practice mixed crop/livestock farming (Sansoucy, 1995; de Haan et al., 1997; IFAD, 2001). The incidence of HIV/AIDS is highest in sub-Saharan Africa where an estimated 24.5 million people are infected with the disease (UNAIDS, 2000). More than two-thirds of the population of the 25 most affected countries live in rural areas (FAO, 2002). This paper summarizes how HIV/AIDS affects livestock production and discusses the need for a better understanding of the disease's impact on the livestock sector and the potential threat of the epidemic to animal genetic resources (AnGR).

PRESENT SITUATION

Livestock /AnGR. The livestock sector in sub-Saharan Africa is mainly made-up of large and small ruminants (cattle, sheep and goats) (Delgado et al., 1999; ILRI, 2000). On a worldwide basis, 15% of all cattle, 16% of all sheep and 22% of all goats are raised in this region (FAO, 2001). Livestock, particularly ruminants, are relied upon for a variety of outputs, including food (meat, milk and milk products), draught power for cultivation, irrigation, harvesting, processing and transport, manure for fuel and fertilizer, and by-products (hides, skins, wool, hair). Livestock are one of the few capital assets owned by the poor and can be crucial to maintaining household survival in times of crisis by providing financial security and a source of cash income. Livestock are particularly important for women because they offer opportunities for generation of household income and represent personal assets. They also provide reinforcement for social support networks and fulfill different cultural roles.

There are 145 breeds/strains of cattle found in sub-Saharan Africa, of which about 32% are considered to be at risk of extinction (Rege, 1999). Resource poor farmers living in marginal production environments are particularly dependent on AnGR of indigenous breeds/strains. These animals often possess valuable traits such as disease resistance, good maternal instincts, longevity, and adaptability to harsh conditions and poor-quality feeds, all qualities that form the basis for low-input, sustainable crop/livestock production. AnGR contribute in many ways to the survival and well-being of livestock owning communities. By matching breeding strategies to environmental and production constraints, the genetic quality and characteristics of animals can be optimized to provide outputs that meet a variety of human and household needs (Köhler-Rollefson, 2000; Scherf, 2000; ILRI, 2001).
Incidence of HIV/AIDS. It is estimated that worldwide 36.1 million adults and children are living with HIV/AIDS. The pandemic is most severe in sub-Saharan Africa where almost 9% of the total adult population 15 to 49 years of age is infected. In nine countries in sub-Saharan Africa, more than 10 percent of the adult population is HIV positive. In Botswana, Namibia, South Africa, Swaziland and Zimbabwe, 20 to 26% of the adult population is living with HIV or AIDS (Schwartänder et al., 2000; FAO, 2002). In Ethiopia, Kenya, Mozambique and Tanzania, 10 to 20% of adults are infected. In Côte d'Ivoire, Cameroon and Mali, infection rates upwards of 40% have been reported (UNAIDS, 2000; Brown, 1997). Two out of every three Africans live in rural areas. While the rate of infection is still lower in most rural populations than in neighboring urban ones, differences between the two populations are narrowing, sometimes rapidly. Thus, the absolute numbers of HIV-infected persons in rural areas may be expected to equal or surpass the number in urban areas (FHI, 1999; FAO, 2002). It is predicted that by 2020 HIV/AIDS will be the single largest infectious killer of adults in their prime in the developing world (World Bank, 1997).

Effects of HIV/AIDS. The effect of HIV/AIDS on agricultural production is related to people’s livelihoods and varies according to ecological zones, farming systems and stage of the disease. Initially, the effects at the farm household level are observed in terms of the impact on family labour. A loss of labour slowly begins to negatively affect the overall farming system due to changes and delays in cropping activities and practices (planting, weeding, mulching, harvesting, etc) (Barnett and Blaikie, 1992; FAO, 1995; Baier, 1997). HIV/AIDS also impacts the transfer of agricultural knowledge and management skills between family members. Traditionally, in many areas, the usual way for children to learn required skills is by working with their parents. Given the HIV/AIDS pandemic, this is often no longer possible and, owing to the gender division of labour and knowledge, the surviving parent is not always able to transfer the skills of the deceased one (du Guerny, 1999). In mixed crop/livestock systems, for example in Uganda and Zambia, women are generally responsible for tasks such as weeding, harvesting minor crops, transporting produce, caring for poultry and performing household duties. The death of the wife to AIDS can make it difficult for other household members to carry out these tasks, in addition to caring for children. Men are usually responsible for cultivation with draught animals, harvesting, threshing and overall farm management. If the man in the household is no longer able to work or dies, even if the cattle and other livestock are not sold to cover medical or funeral expenses, the remaining family members often do not have the management skills, knowledge, time or financial resources to care adequately for them (Stover and Bollinger, 1999; Haslwimmer, 1994).

The extent to which HIV/AIDS impacts the livestock sector is not well known. General household survey information, collected mainly in eastern Africa, indicates that once family savings are exhausted, animals are the main resource sold to cover medical expenses or meet funeral costs. This is observed for both small holder farmers and pastoralists (FAO, 1995). The slaughter or sale of animals reduces herd size, resulting in less livestock products being available for food or marketing/income. Cropping activities may also be affected if draught animals are sold or quantities of manure become limited. Reduced crop yields in turn can cause livestock production to decline because of less feed (crop residues). A lack of labour may affect overall management of livestock, particularly grazing (FAO, 1995; Engh et al., 2000).
Animal health also becomes a concern if veterinary services no longer function properly because staff members are absent from work to attend funerals or care for relatives, or if staff have contracted AIDS and died (Haslwimmer, 1994).

At present, there is a lack of information on the impact of HIV/AIDS on specific aspects of small holder livestock production systems and changes to management practices. For those households afflicted by HIV/AIDS, the “unplanned” disposal of livestock can directly affect breeding programmes. Owners may become forced to sell select bulls or females before they have been able to use them to achieve their breeding goals. In those situations where a bull is shared by several families or a village, the sale or removal of the animal can negatively affect the production and structure of local herds. Decreased herd sizes can reduce available breeding stock and thereby impact AnGR within a community or area. Additionally, lack of family labour and poor knowledge of traditional management systems among remaining family members can result in indiscriminant mating or unsound breeding practices. The extent to which sales of livestock as the result of HIV/AIDS have begun to affect different livestock populations in those countries having a high incidence of the disease is not known.

Rege (1999) reported that the main causes of threat to the 47 breeds/strains of cattle in sub-Saharan Africa thought to be at risk are crossbreeding, inter-breeding civil conflict and neglect. What is also noteworthy about these 47 breeds/strains is that the majority of them are located in those countries which have the highest rates of HIV/AIDS. Thus, it is very probable that sales of animals to pay for medicines and slaughter of animals for funeral rites have begun to impact some of these same cattle populations. Moreover, animals from affected households are likely to be sold to traders and not to other livestock owners who might be more likely to adhere to sound breeding practices. Such sales to traders are likely to result in animals being slaughtered or bred indiscriminately, thereby contributing to the threat of a breed/strain.

NEED FOR ACTION
A better understanding of the short and long-term effects of HIV/AIDS on livestock production at the small holder level is required. Detailed information should be collected on how the disease impacts overall management and production (breeding, herd structures, working animals, feeding, off-take, replacement, animal health, etc.) for small holder crop/livestock farmers and pastoralists. More needs to be learned about the different production and socioeconomic strategies being used by households to safeguard their livestock-related production outputs and assets. It will be necessary to have access to these types of information to reliably predict what will be the impact of HIV/AIDS on overall livestock production, community and national herd populations and, thus AnGR, of countries in 15 to 20 years when the epidemic is expected to reach its peak.

Appropriate strategies and interventions need to be developed which can be employed by international development organizations, donor agencies, NGOs and national governments, including national agricultural research systems, to mitigate the present effects of HIV/AIDS on livestock production and plan for future actions. Those organizations already involved in the monitoring and conservation of AnGR (see Scherf, 2000) could assist in identification of target
Livestock and their products will continue to play an important role in the livelihoods of the rural poor and remain a valuable source of foreign exchange through exports for most of the sub-Saharan African countries afflicted by HIV/AIDS. It is important to address the problem of the pandemic now, as sustainable livestock production and conservation of AnGR will continue to be directly linked to household food security and rural development in the region.

REFERENCES