

# Sustainable Livestock Breeding

Small-scale farmers and pastoralists value livestock for its various different functions. As well as providing product(s), draught power and manure, the economic security and social status that animals confer are very important to livestock keepers. Livestock breeds have evolved over time, with natural and human selection improving these functions and their performance. In Afghanistan harsh climatic conditions, low feed quality and availability, incidences of diseases and other factors result in agricultural output per animal that might be perceived as low by global standards, but it is actually optimal for the circumstances. Local breeds are perfectly adapted to cope with the harsh local conditions and environment.

Breeding is about improving livestock performance. For instance, farmers cross local breeds with high-producing dairy cows to improve milk output. These crossbreeds have the potential to produce more milk, but to do so they also require higher quality feed and management. Breeding is very closely linked to animal feeding and care management, and all three aspects are crucial if one wishes to increase production. Healthy *watani* stocks can excel in production only under ideal feeding conditions, and improved breeds will underperform due to poor nutrition and health management (ILEIA, 2010).

## Box 1: Terminology of breeds

**Local breed:** Breed has been developed by natural selection and simple techniques of mating control and selection used by local farmers and occur usually within one country/region (also referred to “traditional” and/or “indigenous” breeds).

**Transboundary breed:** Breed has been developed for more intensive production systems and have spread globally. Generally they are bred to provide a single product for the market and require high levels of modern inputs and technologies.

**Crossbreed:** An animal with parents of two different breeds and with shared traits of both (F1 hybrid). In the first generation a crossbreed shows high performance potential due to heterosis effect. Crossbreeding is also done to maintain the health and viability of animals, but can also dilute the genetic pool of a pure breed.

**Exotic breed:** An introduced breed that is not found locally is referred to an exotic breed.

Source: ILEIA, 2010; FAO 2007

## Current breeding methods

Natural mating is common for **cattle** in Afghanistan, as cows and bulls graze together and mating takes place with any available bull on the pasture. The cows have a good chance of getting pregnant, but natural mating involves little selection for performance and the chances of inbreeding are high when bulls are not rotated or replaced at regular intervals (Mustafa, 2001). On the other hand, when a farmer keeps his or her cows in a stable, controlled breeding is easier to perform, although finding a suitable bull may present the biggest challenge.

In the case of small ruminants such as **sheep and goats**, herders generally keep adult animals and young stock in different flocks. Breeding rams are segregated from the ewes until the mating season, which starts in late autumn (Mustafa, 2001). To avoid or minimise the chances of indiscriminate breeding (unselective and random breeding), breeding rams are usually exchanged between flocks.

Nevertheless, major challenges do exist in Afghanistan with regards to breeding. Firstly, there is high incidence of indiscriminate breeding, thus the full potential of breeding to increase performance is not exploited. Secondly, inbreeding is a problem, as bulls/rams are not sufficiently rotated among herds/flocks.

Modern breeding methods are not yet widely used in Afghanistan. Artificial insemination is promoted by MAIL, and used for crossbreeding local **cattle** using semen from superior sires of exotic breeds. A network of artificial insemination breeding stations around the country aims to improve production (Mustafa, 2001).

Crossbreeding is the mating of two different breeds to improve their performance and the offspring is called an F1 hybrid. A hybrid shows heterosis effect, which often endows it with superior performance. However, this hybrid vigour gets lost in subsequent generations, and performance declines.

Crossbreeds show improved performance potential, but they also require improved inputs compared to local breeds, including better feed, management and care.

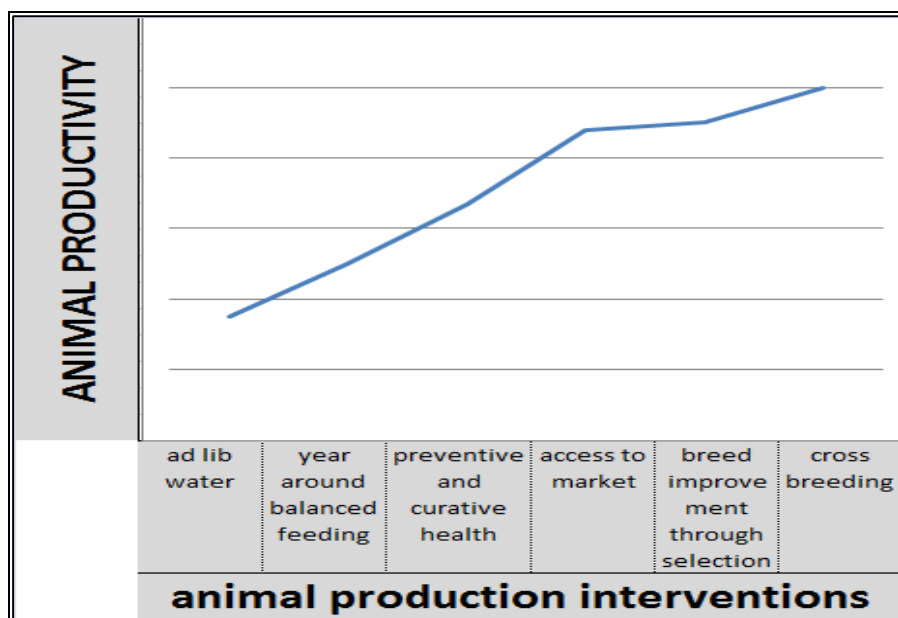


Figure 1: Prerequisites for crossbreeding

Although genetic upgrading (crossbreeding) is often perceived as the first and most important step towards increased production, it should only be promoted when some important prerequisites presented in Figure 1 have been fulfilled:

- Unlimited access to clean water,
- A balanced diet throughout the year (incl. winter),
- Access to preventive and curative animal health services at affordable prices,
- Access to markets to buy inputs and sell the products,
- Improving the local breed through selection.

Most crossbreds have underperformed in Afghanistan for the following reasons (Mustafa, 2001):

- Non-availability of enough and quality feed and fodder,
- Poor resistance to epidemic diseases,
- Genetic instability of crossbred animals,
- Indiscriminate cross breeding leading to inbreeding,
- Poor draft capacity,
- Low price for milk because of low fat,
- Reproduction problems especially dystocia,
- Non-availability of superior crossbred males.

Experiences from India show that over 20 years of promoting crossbreeding have resulted in a tremendous increase in milk production, but this has more to do with a huge increase in the number of animals than with increased productivity (ILEIA, 2010). Crossbreeding is only a viable breeding strategy if other aspects such as animal feeding and management are improved as well. Moreover, crossbreeding tends to be promoted when there is already market demand.

As far as **poultry** is concerned, it is obvious that Afghan women have outstanding breeding skills, since they manage to keep the indigenous breeds pretty pure despite many post-war efforts to upgrade local stock using improved cocks, the distribution of improved varieties of pullets (e.g. Golden) or sometimes through fertile eggs. The problem with these so-called "improved breeds" is that they are normally hybrids (e.g. Golden, Kuroiler) and cannot therefore be used for reproduction, since they lose their hybrid vigour in subsequent generations. Moreover, improved breeds have lost their brooding instinct and can no longer reproduce by themselves. Natural mating is the most common breeding method among the country's traditional poultry farmers; suitable cocks are selected and one is normally kept for the hens, but improved brooding and hatching practices mean that more chicks can be hatched and kept alive.

## Sustainable practices

### Selective breeding

Selective breeding is controlled natural mating of selected animals. The selection of breeding males and females is crucial, not only to avoid indiscriminate breeding, but particularly to increase performance. Moreover, there needs to be regular rotation of male animals to avoid inbreeding and the degradation of breeds. Inbreeding occurs when *the same breeding male is used to serve his own offspring*.

The male animal has to be selected carefully considering the following aspects (Rahim et al. 2012):

- Disposition,
- Fertility,
- Weight,
- Rate of weight gain,
- Conformation of the body,

- Environmental adaptability,
- Milk production capability.

Controlled natural mating is only possible if male and female animals are separated on the rangelands and selectively brought together for mating purposes. For instance, young males that are not used for breeding should be castrated, then allowed to graze with the herd. Most sheep rearers in Afghanistan practise selective breeding.

Table 1 shows the main reproductive characteristics of cattle, sheep and goats.

Species	Heat duration	Heat cycle	Gestation period	Female/male ration	Mating time
Cattle	12–18h	19.5 days	283–285 days	15-30	Summer
Sheep	29–36h	17 days	144–151 days	25-40	Autumn and spring
Goat	24–26h	20–22 days	145–155 days	25-40	Autumn and spring

**Castration:** There are three common methods in Afghanistan for castrating ruminants. *Traditional castration* is the most common and is done by cutting off the animal’s testicles. *Closed castration* is a rapid method where the inguinal tunic is sutured together after incision. *Open castration* refers to a method by which the inguinal tunic is incised but not sutured. The traditional method can cause a number of problems and pain, and capacity-building in animal castration has to be promoted in Afghanistan in order to move towards sustainable livestock management (Aga Khan Foundation and Terre des Hommes, 2008).

### Exchange of male animals

The regular exchange of a breeding male has to be organised between farmers, farming communities and pastoralist herds. Breeding must be organised so that it can support suitable strategies for both sedentary livestock keepers and nomadic pastoralists.

A community may share a male animal (bull or ram) for the purposes of breeding. However, the bull or ram still needs to be exchanged between communities to avoid inbreeding. The best thing is if a community shares a few bulls of different origins that can be shifted from herd to herd within the community. This system of exchanging males would also be possible through private livestock keepers owning a bull or ram. The farmer may even charge a mating fee for the service.

### Role of women

Breeding may affect gender roles, and special attention has to be paid to the labour invested by women, women’s access to livestock, and the benefits derived from livestock.

FAO reported that Indian women opposed an increase in the number of their animals due to limited time and resources. Moreover, they prefer local breeds of livestock and poultry over crossbreds as shown in Box 2 (FAO, 2012).

### Conservation of indigenous breeds

Indigenous livestock breeds are well adapted to local conditions, resistant to diseases and survive on low quality feed. These genetic resources should be conserved for the future. Indiscriminate breeding, crossbreeding and inbreeding will however affect these indigenous

#### Box 2: Reasons of women livestock keepers for preferring indigenous breeds in India

##### Local cattle, sheep and goats

- Low external inputs - feed, medicine and advice
- Well adapted to local conditions and fewer health problems
- Thrive on local feed, fodder and coarse roughage
- Easy to handle and manage
- Replacements are easily available

##### Backyard poultry

- Low external inputs - feed, medicine and advice
- Well adapted to local conditions and fewer health problems
- Thrive on local feed, fodder and coarse roughage
- Thrive on local feed; waste, insects, weeds, etc.
- Can protect themselves from predators
- Market demand and product sells at premium prices
- Replacements are easily available

Source: Adapted from FAO, 2012

genetic resources in the long run. Local breeds will gradually erode and may also become extinct. Rege et al. 2003 reported that the use of exotic germplasm, changes to production systems, changes to producer preferences and a range of disasters (drought, famine, disease epidemics, civil war) resulted in the genetic erosion of indigenous breeds.

Indigenous breed play an important role for livelihood, food security and land use in extensive, low-input production systems such as mixed farming and pastoralist systems in Afghanistan. Indigenous breeds are well adapted to local conditions and production systems, and produce under conditions that crossbreeds or exotic breeds could not even survive. It is therefore crucially important to conserve indigenous breeds. However, apart

from conserving indigenous breed, developing these further through selective breeding is recommendable and in line with what Afghan livestock keepers have been doing for centuries.

To conserve and utilise Animal Genetic Resources (AnGR) in Afghanistan, the Government designed some projects with technical and financial support of international organisations.

### Box 3: Indigenous breeds of Afghanistan

**Cattle:** Kandahari, Kunari, Sistani und Watani

**Sheep:** Karakul, Ghaljai, Arabi, Turki, Baluchi, Hazaragie, Gadik

**Goats:** Asmari/Gujeri, Paroni, Cheeli, Watani/Badakhshani

**Poultry:** Kulangi, Sabzwari, Pusty, Khasaki

Source: Mustafa, 2011

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