

Sustainable Breeding

Small-scale farmers and pastoralists value livestock for its various different functions. Besides 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's 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 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; however, it is very closely linked to animal feed and care management, and all three aspects are crucial if one wishes to increase production. Healthy local 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: 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 as "traditional" and/or "indigenous" breeds).

Transboundary breed: developed for more intensive production systems and have spread globally. Generally speaking, 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, varieties or populations with shared traits of both. 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 selective 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/bucks are segregated from the ewes/does 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, there are major challenges in Afghanistan with regard to breeding. Firstly, there is high incidence of indiscriminate breeding, thus the full potential of breeding for performance is not exploited; secondly, inbreeding is a problem, as bulls/rams are not sufficiently rotated among herds/flocks.

Modern cattle-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 (see Box 1 for terminology). 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 F1 hybrid. A hybrid shows heterosis effect, which often endows it with superior performance.

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

management and care. Although genetic upgrading (crossbreeding) is often seen as the first and most important step towards increased production, it should only be promoted when some important prerequisites have been fulfilled:

- Unlimited access to clean water,
- A balanced diet throughout the year,
- 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 crossbreeds 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 draught capacity,
- Low price for milk because of low fat,
- Reproduction problems especially dystocia (slow and difficult labour / birth),
- 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 ten hens, but improved brooding and hatching practices mean that more chicks can be hatched and kept alive.

Sustainable practices

Sustainable breeding involves the promotion of selective breeding to avoid indiscriminate breeding and inbreeding. If attention is paid to a few aspects of animal selection and male exchange, livestock keepers (women and men) in Afghanistan can improve their local breeds that are perfectly suited to the local conditions.

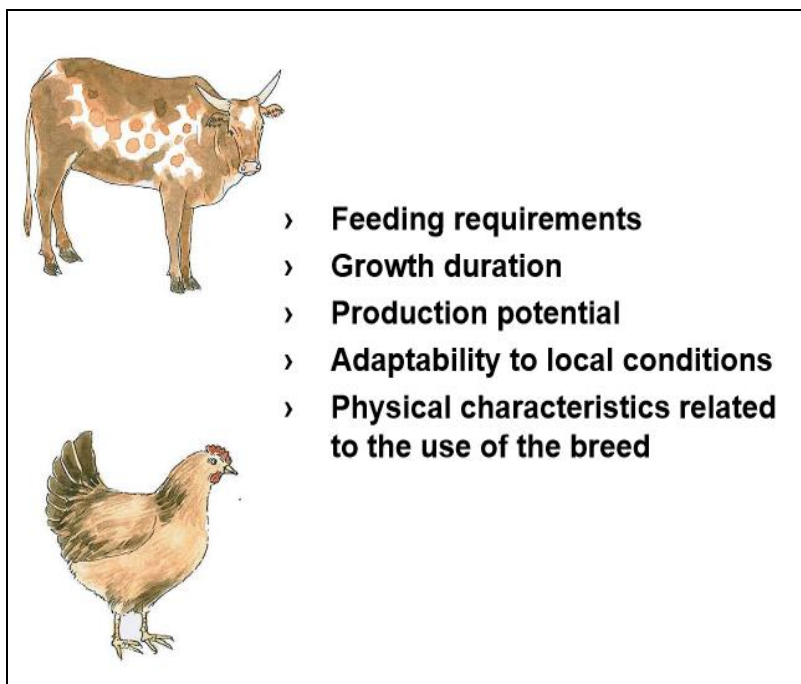


Figure 1: General criteria for selection of animal breeds (FiBL, 2011)

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(s).

Animal selection

The breeding animals have to be carefully selected according to the general criteria presented in Figure 1. Moreover, the following aspects (Rahim et al. 2012) should also be considered when selecting the male animal:

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

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 (see Box 2), then allowed to graze with the herd. Most sheep-rearers in Afghanistan can improve their selective breeding.

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.

Box 2: Castration in Afghanistan

Three common methods of castrating ruminants are used in Afghanistan. *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.

Source: Aga Khan Foundation and Terre des Hommes, 2008.

A community may share a male animal (bull/ram/buck) for the purposes of breeding. However, the bull/ram/buck still needs to be exchanged between communities to avoid inbreeding. The best thing is if a community shares a few male animals 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/ram/buck. The farmer may even charge a mating fee for the service.

Timing of breeding

The right time for breeding is when the female animal is on heat. Box 3 shows main signs of heat in animals.

Along with heat duration and cycle, the time of first breeding is also important.

Box 3: Main signs of heat

- Most females on heat will allow other animals to mount them.
- Cows on heat will mount one another, from the rear or from the front. However the cow on top may not be on heat.
- The vulva becomes swollen and the area around the tail becomes wet and dirty.
- If cows sniff each other's vulva and urine they may both come into heat.
- Cows can be coming into heat if they stand resting their chins on another cow's back or are seen licking or gently butting each other.
- Restlessness and loud calls can also mean the female is coming into heat. Goats become particularly noisy.

Source: FAO, 1994

For sheep, the best time is in the middle of the heat duration. It is also worth waiting three months since the ewe had its last parturition. The ewe needs this time to regain its strength. As for **first breeding**, the best time is 10 to 12 months if the ewe has good feed and is healthy. If a ewe comes into heat, it doesn't necessarily mean that it is ready. (FAO, 1985). Table 1 shows the main reproductive characteristics of cattle, sheep and goats.

Table 1: Reproductive characteristics for ruminants (Rahim et al. 2012)

Species	Heat duration	Heat cycle	Gestation period	Female/male ratio	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

Box 4: 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.

Conservation of indigenous breeds

Indigenous breeds (see Box 4) play an important role for livelihood, food security and land use in extensive, low-input production systems such as Afghanistan's mixed farming and pastoralist systems. Indigenous breeds are well adapted to local conditions and production systems, and produce in conditions that crossbreeds or exotic breeds would not even survive. Conserving indigenous breeds is therefore crucially im-

portant. However, it is advisable not just to conserve indigenous breeds, but to develop them further through selective breeding, continuing what Afghan livestock keepers have been doing for centuries.

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