

# 8

## Changing from Smallholder Low-input and Diversified to More Specialized Livestock Keeping

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### Learning Objectives: Understanding

- The background and reasons for changing from low input to more-specialized livestock keeping
- The characteristics of and requirements for the process of change
- The desired results and risks associated with changing from low-input strategies into more specialized systems

### Reasons for Changing

As indicated in the previous chapters, a family or family member may decide to specialize the keeping system of usually one selected species whenever an opportunity presents itself. As depicted in Fig. 6.1 (page 54), the keeping of this species then changes from low input and diversified to a more specialized system. This implies a higher input level in terms of labour and other inputs than low-input systems. The rest of the animal species will remain under the low-input conditions.

When a family decides to dedicate itself more to one species and to intensify its husbandry, they may do so for various reasons. There are often special reasons within the family in combination with changes in the external situation. Some general factors may influence this transition, for example:

- Improved access to markets and other commercial centres, like better roads;
- Possibility of project support;
- Improved productive opportunities, such as irrigation or new types of crops;
- Opportunities within the ecosystem of the zone, especially the forage and water availability;
- Change in the social system.

There may also be personal, family or community changes that support this transition, such as:

- Loss of work and income in another sector;
- Opening up of a restaurant or other business where leftovers can be used to support animal production;
- Increased availability of money and labour input, for example when a member of the family returns from migration with extra cash;
- Increased community organization related to herding or breeding;
- The start of a producer association in the community;

- Increased level of education of one the family members, for example after graduation from agricultural college;
- Increased personal level of experimentation and self-learning;
- Change in land tenancy.

### Selection of Species of Animal

The species of animal utilized to initiate more specialized husbandry depends on many factors, which may explain why there is a lot of variation among family strategies in spite of similar conditions and ecosystems:

- Preferences, culture and prior experiences of the family or organization to which they belong;
- Family preference for a species already known;
- Manual labour and quantity of land available within a family, to correspond with the need of the species to be selected for specialized husbandry;
- The area's climate and the availability of feed and water;
- External possibilities, such as a market to buy and sell products, transportation conditions as well as the possibilities and conditions of credit and technical services;
- Following the examples of other families;
- The offering of a project.

### Various Examples

Examples of families changing the management of one species from low-input to a more specialized animal system are manifold. Here are some real-life examples from Bolivia, Mexico and Thailand.

- Vladimir in the Bolivian valleys used to work with his younger brothers in a small welding business. Some years ago, he started having problems with his eyes and he started to look for a possible alternative source of income. One day he met a Canadian religious man who wanted to support local people to set up small pig businesses in the area. Vladimir started as the only one interested and now he has a specialized pig husbandry unit beside his house. His parents help him to take care of the animals (van't Hooft, 2004).
- The father of the Franco family in the Bolivian valleys has been one of the thousands of migrants that left his community 8 years ago to go to the large city for work. When he worked on the road, he was bitten by a snake from which he miraculously survived. Since then, he decided to stay and work at home with the family. Together with his wife and children, he decided to specialize in milk cows, making use of the cooperative milking group that had been set up in the community. With support of a dairy project, they started up their dairy. Three years later, they have a dairy with some 12 dairy cows, and additional income from buying and slaughtering cattle and selling the meat in different places (van't Hooft, 2004).
- The Garcia family in the Bolivian valleys had some cows raised under diversified husbandry by Mrs Garcia, while her husband worked on the road in another region. Mr Garcia always wanted to change to specialized dairy production because the milk market was affiliated with a dairy module that guaranteed the sale and price of the milk (Fig. 8.1). Nevertheless, for many years, his wife was not excited until the day when they went to visit a specialized dairy producer. Since that day, she decided that she was going to achieve the same at her house and together they have been able to build a specialized dairy in a few years (van't Hooft, 2004).
- In a small village in the Bolivian valleys, the Ochoa family has had a small restaurant for several years, where they also regularly sell homemade maize beer, known as 'chicha'. With the leftovers of the restaurant and the chicha making they grow pigs, which after slaughtering are served in the restaurant. They also regularly buy pigs on the market for this purpose. When a modern pig-raising farm was started nearby,

they decided to change from local breed pigs to pigs of the exogenous breed from this farm, on the one hand because these animals grow faster than the local breed animals and on the other to reduce the loss of meat of the pigs they buy on the market because of cysticercosis cysts (van't Hooft, 2004).

- In the hills of south central Mexico, a social outreach project of the Methodist Church of Mexico called Give Ye Them to Eat (GYTTE, local NGO) has been working since 1977 to combat hunger and poverty of the rural sector with the Heifer Passing on the Gift programme (Fig. 8.2). Their purpose is to strengthen the capabilities of marginalized people and communities to meet their basic needs. Using livestock as a tool for change, farmers are taught animal

husbandry skills and animal nutrition practices for raising animals of exotic breeds of pigs and goats. Markets are set up for the improved inputs and produce coming into and out of the villages around the projects. A native pig that produces two to four piglets after a year is replaced with a crossbred type of pig that matures to piglet-bearing age within her first year and provides 8–12 piglets, with the capability of farrowing twice each year. The initial gift of livestock and training helps the first group of families to feed themselves as well as provide them with resources for future production. Then they go on to assist their neighbours by providing them with the same gifts that enabled them to improve their lives (Wollen, 2011, personal communication).



**Fig. 8.1.** This family in the Bolivian valleys is successfully keeping dairy cows in a more specialized way, which prevents out-migration and provides for the education of the children.



**Fig. 8.2.** Goats are handed to a woman in a Nepalese village through the Passing on the Gift programme of Heifer International.

- Damrong Taweesuksatit is a farmer in Chaing Dao District in the hills of northern Thailand, where poverty is high because of the high number of migrants, the steep hillsides and soil erosion during the rainy season. Damrong's village grows maize for human consumption as well as for pig production. The village residents favour pork, especially from black pigs. The common practice for animal nutrition is to harvest maize from the fields and to haul the grain to the city for grinding and then have the mill make a complete feed mix for the pigs, which has to be hauled back up into the hills to the village farms. With village ingenuity, Damrong was able to secure a small loan to purchase an electric grain grinder for the maize and a supply of mineral, vitamin and protein pig supplement to mix with the ground grain. With this, he was able to make the complete grain mix for the pigs, right there in the village. Damrong's business has flourished and has drawn additional business from outlying smaller communities. Because of this, many farmers have started rearing exotic breeds of pig. Even though there is greater risk attached to rearing these breeds of pig, the nutritional risks and costs are now minimized because of the complete feeding rations formulated in their own village (Wollen, 2011, personal communication).

### The Desired Process of Change

Once the species has been selected, various elements are required to make the change. The elements vary by species and depend on the desire to work with crossbred animals or with purebred animals of specialized breed.

### Capital

In order to initiate the change, it is necessary to borrow some money or invest capital obtained from migrations or other salaried activities at the time of initial investments

such as the purchase of feed, animals, equipment and medications.

### Animal feeding

Generally, the first thing that needs to be changed is animal feeding. The feeding must change in both quality and quantity with an adequate level throughout the year. With the improvement of feeding, body condition improves in local breed animals as well as in crosses and those of specialized breeds (Fig. 8.3). Individual animals begin to produce more and each one has a higher value.

### Shelter

As one of the first steps, construction of an adequate shelter (Fig. 8.4) is necessary even though it is not necessary to think about very sophisticated construction. There are positive experiences with high-productivity animals in which simple construction made of locally available materials have been used and have been improved according to the growth in the quantity of animals.



**Fig. 8.3.** Feeding cows in a zero grazing system in Cambodia is a labour-intensive system, in which all feedstuffs must be brought to the animals. This gives positive results in terms of production, provided the feeding is continually guaranteed in quality and quantity.



**Fig. 8.4.** Animal shed made of local materials. The manure can easily be collected and used on the crop fields.

### **Purchase of animals**

Often, the purchase of new animals is the beginning of the most visible change. With the purchase of animals of a specialized breed or crossbred animals, an increase in production can be achieved relatively quickly. At the same time, the investment and thus the risk is also higher. Specialization can also be achieved by utilizing a combination of improved management and a gradual change in the genetics of the local animals.

### **Veterinary support and disease control**

With these changes, especially in the exotic and higher yielding breeds, there is a special need for other measures such as parasite control, vaccination and special care.

### **Professional organizations and associations of producers**

The market factor and transport costs are part of the analysis of opportunities that must be made before initiating specialized husbandry. There are better possibilities of organizing the sale of products when agreements between families are reached (Fig. 8.5). An organization of families that dedicates itself to the same activity can achieve favourable mechanisms of transport, purchase and sale

of products, technical support and exchange of knowledge and experience.

### **Added value – value chain**

In addition, the value of the products can be increased by preparing them at home and making secondary products that do not require immediate sale, such as cheese and leather crafts. In other cases, support is given to a larger investment to stimulate the value chain, such as in the case of the special slaughterhouse for llama meat in the Bolivian highlands (Fig. 8.6).

### **Technical support**

During a period of change, families are particularly vulnerable. Knowledge required for the new method of husbandry is different from the knowledge required for diversified husbandry. In specialized husbandry, new diseases and risks are presented. Because of this, appropriate technical support is critical, especially during the first few years of the change, which is when there is much insecurity, unknown problems and debt that has no room for losses. Technical support does not necessarily have to come from professional technicians. More so, the advocates of animal health are of vital importance as well as neighbours and family members that have been through the same process of change.



**Fig. 8.5.** A dairy cooperative society in the Bolivian valleys supports smallholder families in marketing their milk. Being part of an organized group also facilitates other joint activities, such as centralized purchase of cottonseed and other products to reduce the costs of dry-season feeding.



**Fig. 8.6.** A llama slaughterhouse was part of an integrated support project to llama growers in the highlands of Bolivia. Through these slaughterhouses, it was possible to reduce the impact of the cysticercosis parasite in the meat, which helped to increase meat quality and price.

### Positive and Negative Results

There are many projects whose objective is the change of diversified husbandry to more specialized husbandry. Moving to more specialized systems is in itself not a guarantee of success.

The change is considered positive when the family has stabilized itself with the new form of production, they express themselves positively with respect to the change and they succeed in improving their income and level of life. Conversely, the change is considered negative when the family has not been able to stabilize itself with the new productive form, they express themselves negatively with respect to the change and they have not achieved higher monetary income.

If adverse situations do not present themselves, the process of changing from low-input diversified animal keeping to

more specialized animal keeping usually results in improvements of the economic situation of the family and produces social changes resulting from this increase in monetary income (Fig. 8.7). Thus, they can pay off their initial debts and continue specializing their animal husbandry.

The case of two families in the Bolivian valleys – the outcome of changing to more-specialized animal husbandry (van't Hooft, 2004) – are given below.

- Two years ago, Matilde and her family decided to specialize in dairy production. They bought two new cows and they cared for them intensively with their other three cows, dedicating special care to their nourishment. The children helped every day, and the husband who works on the road during the day has built a rustic roof and a special feeding area made from adobe (mud wall).



**Fig. 8.7.** The change of low-input to more specialized livestock keeping can lead to positive results at family level. At the same time, the risks of this strategy are considerable and need to be taken into account when designing a project in this direction.

The cows are now each producing double the quantity of milk that the other animals used to produce. The family has become one of the most important milk producers of the local dairy cooperative. Both the husband and wife are happy and proud of these results. Last year, Matilde was part of the cooperative leadership as the only woman in that position.

- Julio has wanted to specialize in dairy production over the past 2 years. He made silage, and with this, he began to improve the nourishment of his dairy cattle. The results were not as positive as he had expected because he did not have any able children at home to help him, and his wife did not have enough time for the cows because they had adopted an infant girl. The following year, Julio wanted to buy cottonseed to feed the cows during the dry season, but he could not agree with the other families on bringing a truckload from Santa Cruz. The cows were left without adequate nourishment and now Julio is thinking about selling them and starting a new business or emigrating to the USA.

### Risks Associated with the Change

As indicated in Chapter 2, many livestock projects fail. The most frequent reasons

are: over-ambitious project objectives, not including women, top-down methodologies, lack of practical experience, lack of social and cultural sensitivity, power differences in managing funds, failing communal livestock projects, failing marketing schemes and the introduction of exotic breeds in non-optimal conditions (Livestock in Development, 1999).

Because of these frequent and painful experiences, extreme and special care must be taken when starting up a livestock improvement project in which the aim is to change from low-input to more specialized livestock keeping. At a family level, account must be taken of the risks of this process, especially during the first few years. Elements such as initial investments, new diseases of the animals, and instability and dependence on external resources can cause the process to fail and leave the family in worse conditions than those they had before they began the project.

Appropriate technical support is thus critical, especially during the first few years of the change, which is when there is much insecurity, unknown problems and debt that leaves no room for losses. Technical support does not necessarily have to come from professional technicians. More so, the local animal health specialists, such as trained community animal health workers, are of vital importance – as well as neighbours and family members that have been through the same process of change.

### Financial Risk

The availability of money is crucial, especially at the first stages in the process of change. Because of being dedicated to this new type of husbandry, there may be less income from other activities, while the income from the new activity may not yet have been generated, but borrowing more money from the bank at high interest represents a risk that many families with scarce resources do not always want to take.

### **Increased dependency and changes in the market**

Families with more specialized animal keeping are increasingly dependent on the market on which they often have no control. For example, in Bolivia, an Angora rabbit project was started early in the 1990s that promised to give good financial results to smallholder farmers. This was positive for a couple of years until the market was taken over by Chinese farmers who could produce at lower costs. The project broke down and left the farmers with considerable losses as their investments in cages and other valuable equipment was not compensated (van't Hooft, 2004).

### **Unfamiliarity with new animal keeping systems**

Knowledge required for more specialized husbandry is different from the knowledge required for diversified husbandry. During the period of change, families are particularly vulnerable. In more specialized systems, the diseases that affect animals are different from those in low-input systems, like for example milk fever in dairy cattle (Box 8.1).

### **Difficulty breeding high-producing animals and raising young stock**

Most livestock projects that aim to improve productivity build on bringing in exotic

livestock breeds to do so, in the form of crossbreeding, artificial insemination or bringing in live animals.

Many high-yielding animals have difficulties to come into oestrus and to breed when faced with feeding inadequacies (Fig. 8.8). This situation is worsened by common chronic uterine infections that often remain undetected and untreated. As a result, under local conditions of suboptimal nourishment and management, many of these potentially high-yielding animals fail to breed once a year; often breeding only once every 2 years. Over time, this often turns out worse than most local breeds would perform in terms of reproduction (LPP, LIFE network, IUCN-WISP and FAO, 2010).

The offspring of exotic and high-yielding breeds require special feeding conditions in order to grow and mature into healthy, productive animals. Faced with inadequate feeding during the dry season in combination with parasites and other diseases, these animals experience more difficulties in maturing normally than animals of local breeds. In many cases, it is difficult for families to keep up these conditions throughout the year.

### **Unexpected difficulties related to exotic breeds**

Exotic breeds, when introduced without appropriate trials, can lead to unexpected difficulties. For example, in the humid tropics of Bolivia, the introduction of white pigs, such as Yorkshire and Landrace breeds, has not worked out. One of the adverse factors has been the existence of vampire bats

#### **Box 8.1. Mortality from milk fever.**

In specialized dairy production, there is a potentially lethal condition called milk fever or hypocalcaemia, which affects high-producing cows that have recently given birth. This is almost unknown to families that are only familiar with lower-producing cows.

Thus, in many dairy projects, the best dairy cows have died in the hands of families that had changed to this form of dairy production because of their unfamiliarity with this condition. Milk fever can be prevented by having a better understanding of nutrition. It can also be treated relatively easily if adequate measures are taken immediately when the problem arises, by infusing a calcium solution into the vein of the sick animal by a trained person. This requires special attention and skills at the time of parturition (van't Hooft, 2004).

in the zone, which attack at night to suck blood (Fig. 8.9). From this, young female pigs may lose their nipples before the first birth. This often goes unnoticed. As a consequence, the animals lose their ability to feed their young, which die shortly after birth. This problem does not affect the local breeds with red or black skin (van't Hoof, 2004).

### Long-term effects on biodiversity and environment

Efforts to increase the income of poor rural farmers through micro-credit are often directly or indirectly linked to improved

animal health practices within more specialized systems. Those results may be positive in the beginning, yet they could have serious negative side-effects in the long-run. Many of these programmes introduce Green Revolution-type technologies, such as cross-breeding with exceptionally high-producing breeds, use of an abundance of commercial fertilizer, improved seeds that require additional care and other commercial inputs. Without proper training and persistently improved management, these measures have often led to serious environmental degradation, loss of locally valuable genetic breeds and high vulnerability to financial obligations beyond the ability to repay for the families involved.



**Fig. 8.8.** In the case of inadequate feeding, especially the exotic and high-producing animals – both purebreeds and crossbreeds – do not perform well and experience difficulties with repeated breeding, poor calf-growth and mortality.



**Fig. 8.9.** Exotic breeds, such as these light-coloured pigs, can experience unexpected difficulties in the harsh environment of the tropics, for example because of attacks from vampire bats.

### References and Further Reading

- Hooft, K. van't (2004) *Gracias a los Animales Crianza Pecuaria Familiar en America Latina, con casos de los Valles y el Altiplano de Bolivia (Thanks to the Animals – Family Level Livestock Keeping in Latin America with Case Studies from the Bolivian Valleys and Highlands)*. Plural Publishers, La Paz, Bolivia.
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