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## **Biodiversity and Animal Husbandry**

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### **Summary**

Genetic diversity of livestock is vital for sustainable animal husbandry and part of the world heritage. But local breeds and their wide range of capacities are often unknown outside their land. It is estimated that currently two local breeds disappear each week – often ‘replaced’ by high producing industrial breeds. Questions of intellectual property rights, of socio-economics and even of ecology are becoming more pressing. Generally breeds adapted to the local ecology and production systems have the potential to provide great benefits to the local economy, ecology and culture. These breeds are diverse because they are adapted to locally and seasonally available feed and forage and are hardy and resistant to a range of diseases and pests. They are fit for low input production systems and often multifunctional, but give small amounts of products – when measured in kg. Whereas industrial breeds are uniform, need high input feed, are more susceptible to heat, cold and changes in temperature and nutrition and also to pests and diseases.

At present there are no ‘organic breeds’ in the industrialised world, so organic husbandry depends on the developments, goals and risks of industrial breeding. However, even in organic farming the value and potential of locally adapted breeds is not fully recognised.

### **Industrial high input/high performance breeds versus undervalued low input breeds**

In generally we can say that local breeds are undervalued (as are their breeders and keepers) despite their:

- Multi purpose use
- Capacity to adapt to changing conditions, i.e. climate, nutrition
- Suitability for low input systems
- Fitness, robustness, disease resistance, friendly character.

Whereas, industrial breeds are often overvalued, respecting their:

- Suitability only for high input systems
- High needs on fossil energy, imported feed, feed additives, hormones etc.

Up to the 1960’s conventional animal breeding was characterized by a great diversity of farm animals – even in industrialized countries. There was high number of breeds per species (and different landraces per breed), adapted to the respective environment (climate, topography, soil type and vegetation type). But with the subsequent rise of mass production, breeding objectives changed. The aim was to produce uniform products – concerning shape, size and its potential for industrial processing – in a high quantity. The ‘economies of scale’ could be used under these rationalized and specialized conditions and led to a permanent standardization – of the animals and their habitat.

Animals were kept more and more indoors. Instead of letting the animals ‘forage’ or scavenge, rations were composed and artificial supplements added. Instead of producing

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feed on the farm, ingredients of the ration are imported to maximize quality of feed, often from overseas, so that animal can 'realize their genetic potential': i.e. hens that lay more than 300 eggs per year, cows that produce more than 10,000 kg of milk per year and pigs that reach 100 kg of live weight in less than 6 months.

High producing uniform breeds / hybrids are threatened by inbreeding and 'profession'-diseases such as mastitis, infections of the oviducts, stress, Cannibalism, feather-picking and general susceptibility to diseases. These threats to animal health and welfare are 'compensated' for by drugs, low light, electricity, beak breaking etc. Being kept in large numbers in limited space poses also problems to animal health. Strict hygiene is needed under these conditions; animals are kept under 'quasi' quarantine, yet still require prophylactic medicine and as a rule no one from outside the farm is allowed to enter the area. High performance is also contradictory to stress resistance – nevertheless animals are forced to tolerate extreme proximity to other animals.

Above all these intensive production systems need animals which are uniform and genetic diversity under these conditions becomes an obstacle rather than an asset. The advantage of animals adapted to their environment disappeared and so did many of the traditional breeds. Even more the living complexity of relationships– the relationship between farm-animals and their wild relatives, other wildlife, their breeders, their keepers, the surrounding plants, the local ecology, agri-culture, social structure, culture etc – was interrupted.

Industrialized animal production had further consequences – for the environment. The closed nutrient cycle of farms disappeared. Agro-by-products such as straw lost their value as feed. Manure which used to be so important for maintaining soil fertility changed from an asset into a liability. Ruminants previously feed entirely or at least predominantly on roughage were fed cereals or Soya beans, thus competing directly with the nutritional needs of humans.

Despite higher gains, the energy balance (the ratio of the products energy content against fossil energy used in inputs) is far worse in industrial animal production than in traditional animal husbandry. (Today the cheap products from industrial animal production depend strongly on crude oil, which has risen sharply in price over the last year). As industrial animal production depends on just a few genotypes the operation also becomes increasingly risky. If something goes wrong – e.g. the spread of an unknown disease – the likelihood of great damage or even extinction of a breed or even species is far greater with uniform genotypes than with diverse ones. Modern animal breeding has also strictly limited breeding objectives. Whereas for multipurpose animal production, health and character, (mothering abilities, capacity for poultry broodiness etc.) were of concern, modern farm animal breeding places little emphasis on such complex attributes.

There is also a change in stakeholders in breeding. In the 1960's farmers and breeding associations were thriving and had many members. Today, animal breeding is increasingly concentrated into fewer and fewer hands, with the domination of just a few breeders and private firms becoming a real concern. Artificial insemination and more advanced tools in reproduction also allow easy export of genetic material internationally. This means that not only a region, or a country is affected by decisions in animal breeding, but it is increasingly a global business. This can be illustrated with Holstein Friesian dairy cows, where the germ-plasma of the 'best' animals from the United States or Canada is exported world wide and decisions by US or Canadian breeding companies have therefore global impacts.

In summary the current trends in farm animals in industrialized regions are:

- loss of variability within in and between breeds
- tendency to high performance breeds and the use of 'exotics'
- increased use of biotechnology
- privatisation of breeding and of breeds (patenting – in the future)
- loss of breeding-knowledge and -experience of the individual farmers/keepers/breeders side

## **Perspectives for organic animal breeding – an example from Europe**

Today, farm animals within the European Union are mainly industrial breeds or hybrids (poultry and pigs) even in organic farming. Therefore organic animal husbandry depends on the objectives, trends and techniques of the conventional/industrial animal-breeding – with consequences for animal welfare and production systems. As already indicated it is not only the loss of breeds that is of concern, but also the narrow genetic base of ‘modern’ breeds.

So we should not be surprised when problems of animal well-being in organic farming arise. We have to realise that we are taking ‘the second step before the first’, while regulations for management, feeding and health care in organic farming are detailed and have been implemented, animal breeding has not changed its objectives because of the lack of a suitable legislative and economic framework. Even the EU directive 1804/99 which regulates the keeping and feeding conditions in organic animal husbandry, requires only a very general way that breeding should be done respecting animal integrity and welfare.

At present there are no ‘organic breeds’ in Europe and there is a huge backlog for this kind of breeding in research and development for organic purposes. Organic farming needs diverse, vital and long lived animals, adapted to:

- locally available feed and forage
- local wildlife, environment, ecology, seasonal climate changes
- local production, low input systems
- the mentality of their breeders and keepers.

There are however conventional old (often endangered) breeds. A discussion on the necessity, usefulness and feasibility of the development of strains or breeds of animals specifically for organic farming is long overdue. This includes looking also for possible partners and allies including groups that try to conserve old and endangered breeds. At present there are subsidies – however insufficient – for keeping these breeds. However, these subsidies do not fully compensate for the lower productivity of the old breeds, compared with industrial animals. Furthermore, conserving animals does not give room for new developments (e.g. breeding small cattle for landscape maintenance). Basically an important legislative prerequisite for an organic breeding, i.e. breeding which is well adapted to the species needs and the environment, is that those who manage the animals on the farms are also actively involved in the decision making process with respect to breeding objectives.

Organic farming has to focus on reinforcing the robustness and vitality of farm animals. Even small populations of traditional breeds, like the saddle back pig, can be further developed for organic purposes. In contrast to pigs and poultry, bovines are still bred in genuine breeds and not as hybrids. However, even in very influential breeds, like the so numerous Holstein Friesian dairy cattle, inbreeding approaches dangerous levels, and the high level of production makes cattle dependant on feed, like grain or Soya beans, which biologically are better used by monogastric animals, or can be consumed directly by humans. Optimal use of roughage, rather than high production, should be the aim. Land races in central and eastern European countries, with a similar climate, offer the opportunity for the development of organic breeds and close co-operations with breeders in these countries should be recommended.

It is obligatory for animal health and well-being to develop the ‘eco-potential’ of the animals in organic breeding. Organic husbandry, agro-biodiversity and animal genetic resources are a requirement for sustainable development. Organic farming profits generally from those who kept and bred animal genetic resources over decades and centuries. Organic breeding also requires recognition of the cultural value and ecological potential of these animal breeds by consumers – products from organic breeding have to be realistically priced to cover the production costs.

## **The need for livestock keepers' rights**

On first view the situation is, and seems to be, very different: various species with numerous breeds and populations living on five continents in partly or totally different production systems. However, take a second look and the situation seems more similar: economic pressure, policies, legal framework and the biotech and private breeding companies which determine the global impact of changes and development. The development of gene-altered farm-animals is hindered by extreme biological-technical problems, and as yet there is no commercial use of gene altered animals. But gene altered crops and the changing structure of (industrial) agriculture is already a threat for animal biodiversity.

Problems in high performance breeds, such as stress susceptibility, short productive life and inbreeding created an increasing demand for 'alternative' genes. This is both good and bad news. Instead of recognizing the value and potential of local breeds and the support of their further development, there is now a move towards the very longterm and expensive development of making only their genes available by genetic engineering for the industrialized and often already privatised breeds /Hybrids.

A large proportion of local breeds in developing countries are in the care of subsistence farmers and livestock keepers or pastoralists. By definition pastoralists are people that use natural pastures for their livestock, and depend for their livelihood entirely or predominantly on their livestock. Traditionally pastoralists use land not suitable for cultivation, i.e. land too moist, too high, too cold or too dry for cropping. These lands are often only suited for livestock keeping on a seasonal basis. Pastoralists therefore practice seasonal movements with their livestock. As livestock specialists, pastoralists developed a range of breeds of mainly ruminants that were able to cope with harsh environments. This kind of livestock production is complementary to cropping and – because of manure, provision of draft animals etc. – is also capable of synergetic relationships with cropping. Legal and demographic pressure and the ongoing expansion of (fruit-)mass-production for the world-market eroded in many countries the pastoral way of life, not only threatening the sustainable and productive use of marginal land, but also threatening the survival of pastoral animal breeds. Those pastoralists who remain are restricted to less and less land and these politically caused circumstances can cause overgrazing and degradation of land.

Local breeds in developing countries are not only threatened by being crossed with or replaced by industrial breeds, but the recognition of their value and their superb adaptability to their environment makes them a target of bio-piracy for biotechnology. Awareness-raising against this threat means safeguarding access, prior informed consent and fair and equitable benefit sharing in the case of use by third parties. This shows the enormous need for the implementation of pastoralists' and livestock keepers' rights.

Beyond these legal affairs (CBD, Precautionary Principle etc.) policy makers and urban dwellers should be more aware of the significance of pastoralists and livestock keepers and of the indigenous/traditional knowledge for keeping and breeding animals suited for sustainable land use. Recognition of these values – not least the contribution for the local, regional and national economies – is a basic condition for diversity on very different levels: agri-culture, culture, genetic improvement etc. IFOAM could and should offer a wide spectrum of support for all these animal linked opportunities and needs – primarily, regarding the value of breeds and of breeding activities. The global answer to all these threats and opportunities are networks between the different stakeholders – cross-boundary and on all levels.

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## Sources

Developing agro biodiversity, project homepage: [www.agrobiodiversitaet.net](http://www.agrobiodiversitaet.net).

Bayer, Wolfgang and Antje Feldmann (2003): Diversity of animals adapted to smallholder systems. In: *CIP-Upwards Conservation and sustainable use of agricultural biodiversity – a source book*. Los Banos: International Potato Center-User's Perspectives with agricultural research and Development. 207-215.

Bayer, Wolfgang (1989). Low-demand animals for low-input systems, *Ileia-Newsletter*. December 1989. 14-15.

Geerlings, Ellen; Mathias, Evelyn and Ilse Köhler-Rollefson (2002): *Securing tomorrow's food. Promoting sustainable use of farm animal genetic resources*. League for Pastoral Peoples LPP, Local Livestock For Empoverment of Rural Peoples LIFE, Gesellschaft für Technische Zusammenarbeit gtz, MISEREOR, Ober-Ramstadt.

Idel, Anita; Boivin, Xavier; Seabrook; Martin; Vaarst, Mette and Francoise Wemelsfelder (2004): The role of Humans in the Management of Organic Herds. In: *Animal Health and Welfare in Organic Agriculture*. Eds. Lockeretz Willie; Loderick, Stephen; Lund, Vonne and Mette Vaarst.; Cabi Publishing London, p 205 – 225.

Idel, Anita (2003): Animal genetic resources and biopiracy – an impulse paper about the problems of Gene Technology and Patents of life. In *Local Livestock Breeds for Sustainable Rural Livelihoods. Proceedings of a Conference/Workshop 1. – 4- November 2000*, Udaipur and Sadri, Rajasthan, India, p 151 – 161.

Idel, Anita (2002): The Patenting of Animals: Genetic Resources between the competing claims of public property and patent law. In: *Agriculture and Rural Development 1-2002*, CTA, DSE/ZEL, GTZ, DLG, Eschborn.

Köhler-Rollefson, Ilse and Jacob Wanyama (2003): *The Karen Commitment Proceedings of a Conference of Indigenous Livestock Breeding Communities on Animal Genetic Resources*. League for Pastoral Peoples LPP and Intermediate Technology Development Group, Karen, Kenya, 27-30 October 2003: [www.pastoralpeoples.org](http://www.pastoralpeoples.org), [lifeinitiative.net](http://lifeinitiative.net); [www.condial.org](http://www.condial.org)  
Köhler-Rollefson, Ilse (2000): *Management of Animal Genetic Diversity at Community Level*. Gtz-project Managing Agrobiodiversity in Rural Areas, Eschborn.