

Biodiversity in Animal Breeding – Basis of Animal Health **– coming from Weak Point Analysis continuing with Potential** **Analysis leading to Potential Development Plans**

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Biodiversity in Animal Breeding
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Animal Breeding is the main basis for health and welfare of animals. Animal husbandry has to manage these potentials and borders of single animals and herds in a perfect way. Breeding goals of conventional and industrial agriculture are slanted toward performances measured only in litres and kilograms. They move more and more towards high performance animals – away from an agriculture that is appropriate to the species and to the environment. Disease susceptibility and uniformity of live stocks raise the risks of onsets and spread of epidemics.

Breeding goals and evaluation of the breeding value have to be focused on a long-term development of genetic potentials for animal health and fitness. Therefore cross-border cooperation is necessary – also encouraging regional breeding activities and structures.

By means of chemistry and imported feeding stuff animal husbandry is no longer limited by site and regional circumstances. This unlimited availability of fodder and the proceeded use of biotechnology in reproduction¹ are main preconditions for the enormous improvement in performance in the last 40 years. Unilateral selection accelerates a loss of vitality and hardiness. It also pushes a dramatic increase in breeding caused diseases including hereditary defects as well as the disposition for diseases and causing thus shorter and shorter use and therewith life times of animals.

Rationalisation and specialisation demand standardized products. There is an increasing unification of locations as well as a standardisation of growth rates, forms and sizes which leads to an ongoing unification of animals – ending with the hen in the cage. This results in an extreme **adaptation** to uniform locations in combination with a lack of flexibility, i.e. **adaptability** to seasonal circumstances like food supply and weather.

Weak point analyses document a **loss of biodiversity** – as a result of selection slanted toward high performance – not only by a dramatic decrease in the number of races but also with the ominous degree of relationship of animals within remaining races. This also occurs in big populations like Holstein Friesian where single bulls already have more than one million descendants. Since four decades research in animal breeding concentrates on the development of reproduction techniques. These techniques artificially accelerate the unilateral breeding progress – improvement in performance (milk, meat, eggs) – at the expense of animal health and welfare. Breeding goals for health aspects as well as for friendly behaviour are crucial for the enhancement of the animals' potentials to develop a sustainable agricultural utilisation through health and longevity.

¹ However, up to now there are no transgenic – i.e. genetically modified – animals in agricultural practice. Three decades and billions of dollars of governmental and industrial investments could not get over existing biotechnological problems.

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Close relationship between individual animals is the more problematic the more breeding goals are defined in an unilateral way. The target to spread uniform genetic characteristics of high performance is inseparably combined with undesired characteristics founded in this genetic uniformity – for example the loss of individual potential to defend diseases. Close relationship does not need to be a problem in principle, but the combination of close relationship and the tendency to a uniform genetic basis focusing on close and unilateral breeding goals is risky

Most important for health are breeding goals that focus on vitality. Such is exceedingly the – free range – herd of Chillingham with 50 genetically similar cattle considered to be healthy and fertile. For about 300 years the herd was not crossbred with external animals and after the Second World War was simply made up of eight bulls and five cows. But they were the result of a selection over centuries under harsh conditions which can lead to persistent animals (landraces) with the potential for a good constitution. As a consequence, selection for longevity under variable field circumstances (as main breeding goal) could lead to healthy lines of races.

The difference between adaptation and adaptability is clarified by the example of laying hens. For decades laying hens were selected in cages – held under constant environmental conditions. As a result of the adaptation process the immune system of the hybrid hens is not well suited to deal with variable temperatures or food supply as found under free range conditions. There is a correlation between the unilateral increase of performance and a decreasing stress barrier. Thus leads to widespread behavioural problems like feather picking and cannibalism. Similar developments can also be observed in turkeys and ducks.

The impact of unilateral orientation of breeding goals on milk and laying performance results solely in Germany yearly in more than 40 millions dead of one day-old brother chicks of laying hens, because fattening them is unprofitable. Same tendency occurs in male Holstein Frisian and Jersey which are sometimes killed as calves for economic reasons.

Potential for making animal breeding more ecological can be and should be achieved by the generation of – cross-border – networks and research cooperation. Demand in research and call for action has to be brought into agreement with all players participating in the value-added chain: including the definition of criteria for breeding goals for healthy and free range adapted animals as well as adequate product prices – for yard and supermarket sale. In addition to health and free range suitability behavioural characteristics should be aspired as main breeding goals. This regards pleasantness with men and compatibility within the herd.

Currently, the importance of biodiversity is relevant in the context of avian influenza: if wild bird species – e.g. swans – are susceptible for the virus usually not all animals sicken and die. The latter is a sign of an individually genetic based potential of reaction in wild species. In contrast, the epidemic is able to spread easily within genetically similar animals. This phenomenon is visible in hybrid hens and turkeys: both species are susceptible for avian flu (H5N1 subvariety asia) and the rate of sickness and cases of death in a case of infection seems to be close to 100 %.

Complexity and tediousness of breeding developments demand species specific transnational potential development plans.

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Projects

Developing Agrobiodiversity – hindering and promoting conditions” (German Federal Ministry of Education and Research (BMBF), Project manager: animal and gender issues

Network on organic breeding (BÖL - Governmental programme on organic farming)
projectmanager poultry

Transnetwork on organic breeding (Governmental programme on organic farming)
projectmanager