

Challenges for Animal Scientists in the 21st Century

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Abstract

The production of edible protein of animal origin is the primary objective of livestock husbandry. Until 2050 the meat production will be more than double, the milk production will increase to 180 % according to recent FAO-figures. The population increases only from \approx 6.5 to 9 billion people (138 %). The rising incomes lead to the elevated demand and consumption of meat, fish, milk and eggs.

This is a real challenge not only for animal scientists, but also for all those working in agriculture (esp. plant breeders, farmers etc.) Based on this situation, questions, as follow, must be answered:

- What are the real human needs?
- Can the earth feed everyone in the long term?
- Are we making efficient use of the earth's natural resources such as soil, water, fossil fuel, phosphorus etc?
- How do we solve the competition between feed/food for animal/men, fuel, areas for settlements and protected areas?
- What role do animals play in all of this and how should they be treated?
- Do we need genetically modified plants and animals to solve the problems?
- How can we improve the nutrient economy and the safety during the production of food (protein) of animal origin?
- What are the consequences of climate change on animal production as well as animal nutrition?
- Do we have the potential to reduce the excretions of N, P, CH₄ or trace elements by food-producing animals for an environmental friendly animal production?
- Do we need animals to produce edible protein or are there alternatives in the future?

Food of animal origin is a real resource-consuming material, if we consider the dry matter intake of food producing animals (\approx 7 billion tons DM per year) and compare it with human consumption all over the world (\approx 1 billion t). The expectations on animal production have changed in recent years. After the Second World War, people were hungry and asked for anything to eat in Europe. An increase in agricultural production and the utilization of all resources for food production were the challenges for agriculture. Food security was the objective of scientists and farmers. Later it moved to food safety, because enough food was available and the people asked for safe food. Now many people ask "How can we feed the world in the future?" Therefore food security (enough food) and food safety (freedom or minimal content of undesirable contaminants) are the key elements of human health and well being. In addition a number of social questions have emerged, and more are expected in the future. Therefore animal production is presently being considered in a new framework. It is not only asked to produce high amounts of milk, meat, fish and eggs and other food of animal origin. It is also expected to use resources efficiently, consider the environmental, ethical and socio-economic aspects, food safety and quality, as well as some other influencing factors on animal sciences.

Human need, nutrient economy, environmental aspects and further topics of food production of animal origin are discussed in the paper in detail. The increase of animal performance and decrease of animal number seem to be the most efficient way for a better nutrient economy and lower excretion per product of animal origin.