Project Sustainable Animal Production
Final Statement Summary of the Results

Sustainable animal production is a system which preserves the basis of life of future generations. The foundations, conditions and perspectives for animal production are exceedingly variable in different parts of the world. The international workshops conducted in this project focussed on the future supply and quality of food for humans and animals, animal welfare and health, the effects of animal production on the environment, the influences of new technologies, future animal production sites and global trade. The essential results of the workshops are summarized below; it should be noted that these results are not necessarily mutually compatible in every case.

World Food Supply [WORKSHOP 1]
* Following the „Green Revolution" the world's developing countries in particular are experiencing a „Revolution in Animal Production". Growing megacities and favorable economic conditions worldwide in combination with improved supplies of plant products will lead to a constantly increasing demand for food of animal origin.
* Developments in biotechnology have a great potential for increasing production, but care must be taken to insure that these will benefit not only large producers but also rural production structures.
* Animal production is responsible directly or indirectly for nearly half of the agricultural land area in use worldwide. In many parts of the world, regional concentration and intensification of animal production have resulted in damage to the environment and to health which has often not been taken into account.
* This increase in food of animal origin could significantly improve the diets of ca. two billion people lacking sufficient essential nutrients such as iron, iodine, zinc, vitamin A and others with the intake of small amounts of meat (50 g/day) or milk (200g/day).
* There is reason to fear that the world's poorest (ca. 1.3 billion) people will not profit from these developments, particularly those in rural areas.

Production Siting [WORKSHOP 2]
* The greatest demand is expected in third-world and emerging countries, whereas in industrialized countries a plateau has been reached with the focus on marketing quality due to heightened consumer expectations.
* Although the worldwide trade in meat and dairy products does not yet play a major role due to a multitude of trade barriers, European agriculture will be competing with favorable sites in North and South America and in Central and Eastern Europe. At the moment, the political and economic risks obtaining in these European countries still hamper foreign investment.
* On the other hand, European animal producers enjoy the great advantage of geographical vicinity to consumers with whose preferences they are familiar. But in order to profit from this advantage in the increasingly competitive international market, European producers must lower costs, chiefly by implementing structural change and developing well-organized processing and distribution systems.
* In Europe there are obvious discrepancies between governmental regulations and sometimes romanticized consumer expectations on the one hand, and economic reality and structural changes on the other.

Quality Assurance and Product Safety [WORKSHOP 3]
The production of food is subject to constant change, and higher and higher demands are being made on products and the production processes. This development is driven by consumer expectations of food safety, animal welfare and the environment, and progress in biotechnology and genetics. Food safety and quality assurance will be the decisive factors for the processing industry.
* For product safety and quality assurance, the indispensable elements of a concept of sustainable animal production will be future measures for improving food safety before processing and methods for improving quality during primary production.
* As with animal welfare and environmental concerns, these aspects will also play a role in animal production worldwide.
* Efforts to set up programs of quality assurance and product safety at every point in the chain of production should be centered on the development of systems able to meet these goals.
* In order to ultimately attain this goal it is reasonable to formulate a working model, implement and evaluate it and then extend it step by step, in order to determine all parameters necessary to attain an effective system of food safety and quality assurance.

The Environment [WORKSHOP 4]
Modern intensive animal production including aquaculture impacts the environment locally, regionally and globally. In excessive amounts solid and liquid manure, waste water and exhaust from animal housing can be

dangerous and harmful to humans, animals, groundwater, soil, biodiversity and the climate. Excess emissions have been successfully reduced by the application of proper feeding regimes. Little is known about the presence and effects of drug residues and bioaerosols. In the context of the globally increasing demand for food of animal origin the call which is sometimes heard to lower the numbers of animals kept in order to reduce emissions seems unrealistic. The following recommendations should be realized in order to achieve sustainable protectionof the environment:
* Establish environmental standards for animal production worldwide to protect human and animal health; this is particularly important for exporting countries.
* Conduct risk analyses for intensive animal production systems in the various regions of the world.
* Encourage the development of low-emission animal husbandry systems.
* Improve regional planning for locating animal production sites.
* Make environmental protection an essential part of the criteria for world trade in order to secure global nutrition resources.

Animal Welfare [WORKSHOP 5a]
* "Animal welfare relates to the animal's ability to cope with its environment". Based on this premise, animal welfare is to be increasingly concerned with the biological needs and the abilities of the animals to adapt in accordance with genetic predisposition and multifunctional expression. A concept of animal welfare based solely on ethology can no longer be justified.
* Globally changing structure in agricultural animal husbandry and progress in breeding and biotechnology have brought new challenges to the science of animal welfare. In future, new technologies should also be judged from the standpoint of animal welfare.
* There are great differences worldwide in the acceptance of and the assumption of the necessity of animal welfare; prevailing notions in rich countries are often perceived as efforts to raise trade barriers. Therefore it is necessary to establish international standards of animal welfare for world trade agreements which are mandatory. These standards must be based on established scientific knowledge and practical experience.
* The animal farmer works to make money. If animal production is to continue in Europe, the additional costs incurred by animal welfare provisions must be reflected in additional profits. Farmers and trade organisations will be the driving force behind improving animal welfare to the degree that consumers are willing to pay more for animal welfare.

Animal Health [WORKSHOP 5b]
Constant worldwide structural changes in animal production (including aquaculture) have crucially contributed to increased health risks for animals and humans. Worldwide, huge economic losses are caused by OIE List A diseases, “new” or infectious diseases long believed conquered, antibiotic-resistant and multifactorial diseases. In addition, such diseases often pose serious trade barriers. Problems due to disease can be reduced or even eliminated if the entire spectrum of preventative and prophylactic measures are implemented as part of health programs. This strategy requires the cooperation of producers, veterinarians, public health authorities, the industry and consumers. Thanks to their position in the economy, consumers can provide producers with economic incentives to act. The implementation of animal health programs is a continual, never-ending process.

Biotechnology [FORUM 6]
For many years biotechnological procedures such as artificial insemination and embryo transfer have been an integral part of modern animal husbandry, and they have resulted in the well-known and recognized improvements in performance in agricultural animals. But certain disadvantages could not be countered by these techniques: the relatively slow annual rate of genetic progress (1-3%), the lack of a way to separate desirable from undesirable traits by breeding, the impossibility of transferring genetic information between species. New biotechnology and genetic technology already available and others under development indicate that it will be possible to overcome these limitations to breeding. Today „biotechnology in farm animals“ basically includes techniques in reproductive and molecular biology intended to enhance performance, efficiency and health for sustainable animal production.
* In the very near future the complete sequencing of the genomes of important domestic animals will make it possible to distinguish molecular phenotypes and thus improve the use of genetic resources.
* In view of the world’s limited resources and increasing population, biotechnology and genetic technology will provide important tools for making animal production more efficient, environmentally appropriate and economically viable.
* Cloning and transgene technology will open new horizons both for biomedicine and for many agricultural applications, particularly in the area of product diversification.

* The development and application of biotechnology and genetic technology in animal breeding must be accompanied by interdisciplinary research leading to more rational and factual social and ethical discourse.

Genetic Resources [WORKSHOP 7]

* For intensive breeding programs for poultry, swine and dairy cattle, existing genetic variability within breeding populations is considered to be sufficient to guarantee genetic progress in the foreseeable future in all aspects of production and animal health. The preservation of economically insignificant and therefore endangered species of domestic animals is seen as a matter of public concern for the preservation of cultural history.
* In countries where livestock production is under development, genetic improvement of well-adapted local breeds is of prime importance and should also contribute to their preservation. This means above all encouraging the evaluation of local breeds and establishing systematic hybridization programs with them, and not their replacement with unsuitable breeds from high-input systems. These are important tasks for the global FAO program “Development of Animal Breeding in Lower Production Environments". Nevertheless globally operating high-input breeding organizations should also make suitable programs available to developing countries.

Animal Nutrition[WORKSHOP 8]

Although the world’s population is expected to grow by only 25% in the next 20 years, an increase of 50% in the demand for food of animal origin is projected. The decrease in absolute and per capita land area available for agricultural use will result in less area available for producing feed and to increased competition between humans and animals for energy and nutrients. In this context it is an important task of the science of animal nutrition to discover and exploit new resources, particularly products which cannot be used directly by humans (e.g. high-fiber organic substances) or which are considered undesirable or unsuitable for human consumption (offal and other food industry byproducts). Whereas the utilization of byproducts as animal feed was once an exemplary economic model for recycling, in recent years doubts have arisen, due to the occurrence of BSE and the discovery of dioxins in feed. In industrialized countries agricultural policy has in part responded to these issues with new regulations. But it is very doubtful if it can be considered ecologically responsible, economically reasonable or in the long term politically justifiable to use byproducts considered valuable by nutritionists as fuel or to dispose of them as waste. Such a trend may be tenable for a short time in Europe, but it will not be acceptable worldwide, particularly in regions where feed supplies are scarce.

Global Trade [WORKSHOP 9]

Following the GATT (General Agreement on Tariffs and Trade), the World Trade Organization (WTO) has sought to regulate and simplify world trade, including the international trade in animals and products of animal origin. In 1994 the Sanitary and Phytosanitary Agreement (SPS) was signed. The animal sanitary aspects of this treaty are based on scientific recommendations and the standards of the Office International des Epizooties (OIE) in Paris. However there are still unresolved fundamental questions that pose future challenges, such as animal welfare, the environment and questions arising from the new biotechnology. There are vast discrepancies in international opinion, and often rich nations are accused of attempting to raise unjustified trade barriers with new regulations and standards. In this area it is essential – as in the animal health sector – that recognized international organizations develop scientific standards and rational methods for solving these problems.As some of these problems are also important for animal health, it would be make sense to increase the scope of authority of the OIE accordingly.

Future Perspective

The insights and recommendations from the various workshops are in part embued with social and political aspects, but all bear a moral and ethical dimension. The realization of these goals is a challenge equally important to the public, politicians and scientists alike.

Hannover, Germany, 16 October 2000