Fact Sheet
Genetically Engineered Animal Made Pharmaceuticals

For decades, animals have been used to produce pharmaceuticals for the benefit of human health. Biologics such as antibodies used for anti-venoms and transplant organ rejection, heparin (an anti-blood clotting protein) and many others have been obtained from horses, pigs, rabbits and other species.

Biotechnology now allows us to genetically engineer animals so that they produce proteins that are human pharmaceuticals. For certain drugs that are difficult to produce using existing methods or are needed in large quantities, production in GE animals offers the most efficient and practical solution. In the case of fighting infectious diseases, GE animal-made antibodies can be produced from animals that have had the human antibody genes transferred to them. These animals can then be vaccinated against human diseases and antibodies can be collected from their blood and used for treating diseases in humans. For example, antibodies can treat infections that are resistant to antibiotics.

Other applications include making animal organs compatible with humans, a technology known as xenotransplantation. Research is being conducted to produce transplant organs in pigs that may be a source of organs for humans. These technologies could save hundreds of thousands of lives and increase quality of life for many more in the future.

There is currently only one approved product in the world from a GE animal. That product, ATryn®, is a human pharmaceutical – an anti-blood clotting factor – produced in the milk of GE goats and approved by the European Commission in August 2006.

Benefits of Genetically Engineered Animal-Made Pharmaceuticals

GE animal-made pharmaceuticals offer many benefits that will improve consumer health and well-being and improve quality of life by making life-saving drugs available from sources that were previously non-existent. Other benefits include:

- Producing biologics, proteins and tissues in animals that are compatible with humans
- Compatibility means less rejection and fewer complications from using animal proteins or tissues
- Greater availability of these products and potentially lower cost due to increased production capacity
- Greater opportunities for new products as industry and technology advances
- Better treatment for disease: Improved quality of life and enhanced human population stability
- Enhanced management practices for domesticated species can be used for caring for these animals

Animal Welfare and the Environment

By keeping animal welfare at the forefront of any new technological applications, GE technology (as well as other animal biotechnologies) offers tremendous potential benefits. These benefits can only be realized by protecting the environment as well as the health and well-being of the animals. Animal-made pharmaceuticals cannot be produced in sick animals and so every effort must be made to ensure animal welfare.

Most of these technologies are being developed in domesticated animal species. Since these animals live on farms, the risk to the environment is miniscule since most of these species do not mate with wildlife. There is no scientific evidence in any area that biotechnology poses a risk to the environment. Currently, GE animals used to produce pharmaceuticals are excluded for use in the food supply.