Fact Sheet
Genetically Engineered Animals

A genetically engineered (GE) animal is one which has had a deliberate modification made to its genome. Genetic engineering allows scientists to precisely transfer beneficial genes from one species to another. GE animals provide solutions to transform public health through biomedical, environmental, and food applications.

Benefits of Genetically Engineered Animals

GE animals offer benefits in five broad areas of scientific development:

- **Advancing human health:** through production of pharmaceutical proteins, drugs, vaccines and replacement tissues for the treatment and prevention of human disease.
- **Enhancing foods through healthy animals:** improved food production traits enables animals to produce more efficient, higher quality and lower-cost sources of food.
- **Reduced environmental impact:** improving the environment with the consumption of fewer resources and the production of less waste.
- **Optimal animal welfare:** reducing disease susceptibility, increasing lifespan and quality of life and well-being.
- **Improving industrial products:** Production of high-value industrial products such as spider silk used for medical and defense purposes

Advancing Human Health

One of the more compelling benefits of GE animal technology is its human health applications. GE animals are integral to the development of new diagnostic techniques and drugs for human disease while delivering clinical and economic benefits that cannot be achieved with any other approach. Through genetic engineering, scientists are able to produce therapeutic proteins to use in treating cancer, heart attacks, hemophilia, rheumatoid arthritis, pandemic flu, malaria, small pox and other diseases. In addition, scientists are researching how to use these animals to grow transplant organs that can be used when other options have been exhausted.

Enhancing Foods Through Healthy Animals

In addition to human health applications, genetic engineering of animals can help improve food production. For example, a GE salmon is bred to grow to a mature size more quickly, increasing the efficiency of food production. GE technology promises improved animal productivity, and it can improve the nutritional value of foods. This ability is critical in helping to supply enough food to support an ever-growing global population. GE animals currently under development include pigs, sheep, goals, chicken, fish and cattle all of which will be thoroughly reviewed by the appropriate federal agencies before entering the marketplace.

Animal Welfare and the Environment

Genetic engineering can also be used to mitigate environmental impacts of livestock production. One example of this is the EnviroPig™, which produces dramatically lower levels of phosphorus pollution than traditional pigs. Genetic engineering also can improve the welfare of the animal by imparting resistance to disease and enhancing overall health and well being.

For more information: BIO recently released a scientific report entitled "*Genetically Engineered Animals and Public Health: Compelling Benefits for Health Care, Nutrition, the Environment and Animal Welfare"* by Dr. Scott Gottlieb and Dr. Matthew Wheeler. It is posted at **www.bio.org**.