Animal Cloning and Food Safety

Photos: USDA/Agricultural Research Center

After years of detailed study and analysis, the Food and Drug Administration has concluded that meat and milk from clones of cattle, swine (pigs), and goats, and the offspring of clones from any species traditionally consumed as food, are as safe to eat as food from conventionally bred animals. This conclusion stems from an extensive study of animal cloning and related food safety, culminating in the release of three FDA documents in January 2008: a risk assessment, a risk management plan, and guidance for industry.

Meat and milk from cow, pig, and goat clones, and the offspring of any clones, are as safe as food we eat every day.

Researchers have been cloning livestock species since 1996, starting with the famous sheep named Dolly. When it became apparent in 2001 that cloning could become a commercial venture to help improve the quality of herds, FDA's Center for Veterinary Medicine (CVM) asked livestock producers to voluntarily keep food from clones and their offspring out of the food chain until CVM could further evaluate the issue.

FDA Studies Cloning

For more than five years, CVM scientists studied hundreds of published

The main use of clones is to produce breeding stock, not food.

reports and other detailed information on clones of livestock animals to evaluate the safety of food from these animals. The resulting report, called a risk assessment, presents FDA's conclusions that

- cloning poses no unique risks to animal health, compared to the risks found with other reproduction methods, including natural mating
- the composition of food products from cattle, swine, and goat clones, or the offspring of any animal clones, is no different from that of conventionally bred animals
- because of the preceding two conclusions, there are no additional risks to people eating food from cattle, swine, and goat clones or the offspring of any animal clones traditionally consumed as food

FDA issued the risk assessment, the risk management plan, and guidance for industry in draft form for public comment in December 2006. Since that time, FDA has updated the risk assessment to reflect new scientific information that reinforces the food safety conclusions of the draft.

"Our additional review only serves to strengthen our conclusions on food safety," says Stephen F. Sundlof, D.V.M., Ph.D., Director of FDA's Center for Food Safety and Applied Nutrition. "Meat and milk from cow, pig, and goat clones, and the offspring of any animal clones, are as safe as food we eat every day."

FDA's concern about animal health prompted the agency to develop a risk management plan to decrease any risks to animals involved in cloning. FDA also issued guidance to clone producers and the livestock industry on using clones and their offspring for human food and animal feed.

What Is a Clone?

"Clones are genetic copies of an animal," says Larisa Rudenko, Ph.D., a Molecular Biologist and Senior Adviser for biotechnology in CVM. "They're similar to identical twins, but born at different times." Cloning can be thought of as an extension of the assisted reproductive technologies that livestock breeders have been using for centuries, such as artificial insemination, and more recently, embryo transfer and in vitro fertilization.

Animal cloning has been around for more than 20 years. Most cloning today uses a process called somatic cell nuclear transfer:

- Scientists take an egg from a female animal (often from ovaries at the slaughterhouse) and remove the gene-containing nucleus.
- The nucleus of a cell from an animal the breeder wishes to copy is added to the egg.
- After other steps in the laboratory take place, the egg cell begins to form into an embryo.
- The embryo is implanted in the uterus of a surrogate dam (female parent), which carries it to term and delivers it like her own offspring.

Clones may allow farmers to upgrade the quality of their herds by providing more copies of their best animals—those with naturally occurring desirable traits, such as resistance to disease, high milk production, or quality meat production. These animal clones are then used for conventional breeding, and their sexually reproduced offspring become the food-producing animals.

What Cloning Means to Consumers

- FDA has concluded that cattle, swine, and goat clones, and the offspring of any animal clones traditionally consumed as food, are safe for human and animal consumption.
- Food labels do not have to state that food is from animal clones or their offspring. FDA has found no science-based reason to require labels to distinguish between products from clones and products from conventionally produced animals.
- The main use of clones is to produce breeding stock, not food. These animal clones—copies of the best animals in the herd—are then used for conventional breeding, and the sexually reproduced offspring of the animal clones become the food-producing animals.
- Due to the lack of information on clone species other than cow, goat, and pig (for example, sheep), FDA recommends that other clone species do not enter the human food supply. FDA

For More Information

www.FDA.gov/cvm/cloning.htm