

Rifkin Takes Aim at USDA Animal Research

A lawsuit has been filed to block gene-transfer studies, but the larger target is USDA's animal breeding programs

Jeremy Rifkin, the social activist and persistent critic of genetic engineering, has filed another lawsuit against biotechnology research. The current target is the U.S. Department of Agriculture's mammalian gene-transfer program at its Beltsville, Maryland, facility. However, Rifkin says that although the USDA's gene-transfer experiments provided the immediate impetus for his suit, the department's broader research on the breeding of farm animals is his real target. Joining Rifkin in this action is Michael Fox, a veterinarian representing the Humane Society of America.

The lawsuit, which was filed in the U.S. District Court of the District of Columbia on 1 October, clearly has frustrated some USDA officials. The department has been under considerable pressure to beef up its biotechnology programs in general, and a good deal of effort has been directed toward the Beltsville facility in particular (*Science*, 21 September, p. 1376). The lawsuit is seeking to block some of the department's most ambitious forays into genetic engineering research, and comes just when congressional resistance to enlarging the department's overall biotechnology programs was beginning to give way (*Science*, 5 October, p. 29).

The immediate aim of the lawsuit is to stop experiments involving the transfer of growth hormone genes from other, "foreign" mammalian species into sheep and pigs. The principal source for the foreign hormone gene now being used in the USDA experiments is man. Because of its relatively convenient availability, the human version of a growth hormone gene has been studied most frequently by scientists conducting these kinds of gene-transfer studies. In the experiments, genes are inserted by microinjection into fertilized eggs that have been removed from the sheep and pigs. The eggs are then reimplanted into the uterus of surrogate mothers to continue through a more or less normal gestation.

Similar experiments have been conducted, with varying degrees of success, on rats and mice. Besides testing whether such genes can be transferred at all, the aim is to introduce a version of growth hormone that will escape feedback biochemical control loops in the animal, thereby stimulating more rapid than usual growth. In the Beltsville project, the genes have been transferred successfully, but at a low frequency, into a number of animals. However, there is, as yet, "no indication the genes have made bigger pigs," a USDA official told *Science*.

According to USDA officials, such experiments eventually could lead to genetically engineered farm animals that grow more quickly and efficiently to a standard size, thus bringing meat to market more cheaply. The experiments are also prototypes for introducing other desirable genes, such as those conferring disease resistance, into valuable species that lack them. "We're at a very preliminary stage," says a USDA official. "I'm not sure what the issue is with farm animals. The pigs are still pigs." The experiments would not be possible were it not for the fact that there is great biological similarity between human growth hormone and the hormone in other species.

"We're trying to establish the principle that there should be no crossing of species barriers in mammals," Rifkin says in explaining the basis of his lawsuit against USDA. He raises three main categories of objection to the experiments—environmental, economical, and ethical. The mixing of genes across species barriers, he argues, could lead to environmental disruptions if animals begin to gain or lose traits that they have long had and depended on. On legal grounds, this translates into an assertion that the USDA has not complied with the National Environmental Policy Act (NEPA) because it failed to file an impact statement assessing these experiments.

On economic grounds, Rifkin argues that such breeding programs, particularly when they involve "monoculture," can lead to animals with dependence on special diets and drugs that result in increased costs for consumers. And on ethical grounds, he and Fox claim that the USDA's breed-



R. L. Brinster and R. E. Hammer

Experiments in which some mice (right) grow larger because they receive a foreign growth hormone gene are the prototype for controversial USDA research involving pigs and sheep.

ing practices have led to inhumane treatment of farm animals by making them obese, subject to skeletal abnormalities, and unable to mate properly. They also argue that gene-transfer experiments violate the rights of animals by "robbing them of their unique genetic make-up."

Besides citing NEPA, Rifkin and Fox also invoke the federal public nuisance law as well as several other statutes for preserving and humanely treating animals. "We are challenging the entire USDA breeding program," Rifkin says. "And we're asking the court to make sure no government funds are involved in research designed to take genes into germ line cells . . . of mammals."

USDA attorneys have not yet prepared a response to the lawsuit, USDA official Dan Laster told *Science*. "Gene insertion experiments within animals . . . are critical for the future progress of research. If U.S. scientists can't do these experiments, they'll be done in other countries. It will be devastating to agriculture and to scientific and technical development," he asserts. "The experiments will continue until we're told to stop."—JEFFREY L. FOX