From Lab to Farm

Farmers and ranchers have long practiced selective breeding to get livestock with particular, desirable traits. Scientists are working toward similar results through genetic engineering. The first transgenic farm animal was a pig developed in 1988 by the research team at a United States Department of Agriculture lab in Maryland. The team aimed to create a pig that would produce leaner pork. The modified pig did, indeed, result in leaner meat but the animal also suffered from a variety of ailments including arthritis and kidney disease. Since then, scientists have learned more about how genetic engineering could work in pigs and other animals. They have developed a number of genetically modified animals for use as food, but for a number of reasons, no animals have yet made it to grocery store shelves.

Many companies and research groups around the world have focused on creating transgenic salmon, carp, and catfish that grow bigger and faster than their ordinary cousins. One company, Aqua Bounty Technologies, has created a breed of salmon that grows twice as fast as normal farmed salmon. Aqua Bounty's salmon contains a gene from a fish, the ocean pout, which grows throughout the year. Normal salmon typically grow only during the summer, so the addition of the ocean pout gene extends the genetically engineered salmon's growing season. They estimate the new salmon will enable the average salmon producer to cut costs by 35% per fish while doubling output. "It's like improving the mileage in your car," one scientist from the company explains.

Farmed salmon

But before the fish can be farmed for commercial sales, Aqua Bounty must get approval from the U.S. Food and Drug Administration. Aqua Bounty's toughest challenge has been to prove that if the engineered salmon escape from a fish farm into the open ocean, they would not mate with their wild counterparts. If this cross-breeding were to happen, the altered genes could spread to the offspring, which could then grow faster and out-compete other wild salmon. The gene would continue to spread, and the wild salmon population could be eliminated. Aqua Bounty could prevent this gene spread by focusing its efforts on sterile fish or fish grown indoors.

Other critics of genetically engineered fish are concerned that mixing genes from different species could lead to unpredictable consequences. Some scientists suggest that the environmental implications of genetic engineering could be widespread and that many of the potential consequences are, as of yet, unknown. The consequences could include the loss of natural species that are "out-competed" by genetically engineered animals.

Traditional salmon farming poses environmental problems. Fish farmers grow these salmon in open cages with thousands of fish concentrated in a pen the size of a small house. The farmers often bind together a dozen or so of these pens. Fish feces pass into the waters around the pens and contaminate the water with as much raw sewage as a town of 65,000 people. Presumably, faster-growing fish would need more food and thus produce more feces and more contamination.

Still others are concerned about the potential health effects to those who eat modified fish. Developers say that the engineered fish will not look or taste any different to consumers, but critics point out that no one knows how proteins in genetically modified foods may differ from the proteins from which they originated. Farm raised salmon are known to contain higher levels of toxins, such as polychlorinated biphenyls (PCBs), than wild-caught salmon. If the cost of farmed fish declines and people's consumption of it increases, human health could be affected.

Salmon for sale

Experimental pigs