

# Campaign on Genetically Engineered Fish



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## **Scientific Studies On Genetically Engineered Fish** A Publication of the Center for Food Safety

The use of genetically engineered fish raises a number of serious questions about their ecological impacts. These risks include genetically engineered fish being more aggressive, eating more food, and attracting more mates than wild fish. Below are excerpts from a number of studies indicating the potential for serious environmental impacts caused by genetically engineered fish.

- **Threat to Endangered Species**

Studies conducted by two scientists at Purdue University show that genetically engineered fish may have a greater mating advantage due to their larger size. However, their offspring may have a reduced ability to survive because genetically engineered fish are "macro mutants that lack any history of selection that could reduce negative fitness effects." As a result of genetically engineered fish producing the least fit offspring yet obtaining a disproportionate share of the mates, the Purdue scientists predict that *if 60 genetically engineered fish were into a population of 60,000 wild fish, the species would become extinct within only 40 generation.* They refer to these disturbing results as the "Trojan gene effect." William M. Muir and Richard D. Howard, Possible ecological risks of transgenic organism release when transgenes affect mating success: Sexual selection and the Trojan gene hypothesis, 96 PNAS 13853-13856 (Nov. 23, 1999). This report is available online at [www.biotech-info.net/trojan\\_gene.pdf](http://www.biotech-info.net/trojan_gene.pdf)

- **Disruption to the Entire Marine Environment**

This article discusses the potential ecological impacts from releasing genetically engineered fish into the environment. Kapuscinski and Hallerman predict that the release of transgenic fish "could destabilize and eventually reorganize ecosystems." Eric M. Hallerman & Anne R. Kapuscinski, Ecological implications of using transgenic fishes in aquaculture, 194 ICES Mar. Sci. Symp. 56, 59 (1992).

- **Impacts on Native Fish Populations**

The Council on Environmental Quality ("CEQ") recently issued a study assessing the impacts of genetically engineered fish. CEQ found that it must be assumed that genetically engineered fish will escape from net pens. Given the likelihood that genetically engineered fish will escape net pens, CEQ assessed the reliability of sterilization and found that 100% sterilization cannot be guaranteed. CEQ also identified the ecological factors that should be addressed in assessing potential risks, including the degree of fitness, interaction with other organisms, and role within the ecosystem of genetically engineered fish. Case Study No. I, Growth Enhanced Salmon, in CEQ and OSTP Assessment: Case Studies of Environmental Regulation for Biotechnology, available at: [www.ostp.gov/html/ceq\\_ostp\\_study2.pdf](http://www.ostp.gov/html/ceq_ostp_study2.pdf) (last visited Apr. 19, 2001).

- Questions Over Need For Genetically Engineered Fish

Robert Devlin recently published a study finding that inserting a growth hormone into a domesticated strain of fish “did not cause further growth enhancement.” In addition, Devlin found that the growth of genetically engineered wild trout did not surpass a fast growing domestic strain of trout grown in aquaculture facilities. Other Devlin studies show that genetically engineered fish are less careful about avoiding predators and may not be able to endure the arduous migratory process. Robert H. Devlin, et al., Growth of domesticated transgenic fish, 409 Nature 781 (Feb. 15, 2001); Robert H Devlin, et al., Increased ability to compete for food by growth hormone-transgenic Coho salmon *Oncorhynchus kisutch*, 30 Aquaculture Research 479-482 (1999). Devlin’s latest study is online at:

[http://www.nature.com/cgitaf/DynaPage.taf?file=/nature/journal/v409/n6822/full/409781a0\\_fs.html](http://www.nature.com/cgitaf/DynaPage.taf?file=/nature/journal/v409/n6822/full/409781a0_fs.html)

- Canada’s Expert Panel Recommends a Moratorium on the Raising of Genetically Engineered Fish in Aquatic Net Pens

Canada’s expert panel on the regulation of food biotechnology reviewed the ecological risks associated with the commercialization of genetically engineered fish. In reviewing the environmental impacts associated with genetically engineered fish that escape from net pens, the expert panel found that there were significant scientific uncertainties concerning the genetic and ecological interactions between genetically engineered and wild fish. Based upon this review, the expert panel recommended a moratorium on the raising of genetically engineered fish in aquatic net pens. Royal Society of Canada, Elements of Precaution: Recommendations for the Regulation of Food Biotechnology in Canada, 89 (Jan. 2001).

- Moratorium Request by the American Society of Ichthyologists and Herpetologists

The American Society of Ichthyologists and Herpetologists issued a resolution stating that the current research shows that genetically engineered fish may pose negative affects to fish, including endangered and threatened species. The Society recommended a moratorium on the marketing of genetically engineered fish until it is established that these fish cannot escape into open waters. Furthermore, the Society stated that genetically engineered fish are not an effective or ecologically safe solution to world hunger. The Society petitioned U.S. and Canadian federal agencies to establish a system for oversight to regulate transgenic fish. Statement of the American Society of Ichthyologists and Herpetologists, available at [www.greenpeace.org/](http://www.greenpeace.org/) (last visited June 11, 2001).