Council

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Background information provided by Greenpeace regarding transgenic (Genetically Modified – GM) Fish

NGO Statement

Greenpeace International

Background information provided by Greenpeace regarding transgenic (Genetically Modified – GM) Fish for the Eighteenth Annual Meeting of NASCO

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Transgenic Fish – Swimming against the tide of reason

Genetically engineered (GE) fish are now being developed in many countries around the globe for different purposes such as increased size and speed of growth. Many different species of fish are currently the subject of genetic engineering experiments with the aim of future use in commercial aquaculture operations, including salmon, tilapia, bass, trout and catfish. Genetically engineered fish pose a serious threat to marine biodiversity. They have the potential to be invasive species that could cause irreversible ecological damage to wild fish stocks as well as the wider marine environment. Scientific experiments suggest that the introduction of only a few transgenic individuals could wipe out entire populations within just a few generations. Once genetically engineered fish are released or escape into open waters, they can never be recalled.

The first application for the approval of the use of genetically engineered fish in commercial agriculture – in this case salmon - is presently being considered by the US Food and Drug Agency. Remarkably, the US FDA is reviewing this only under its regulations on animal drugs. Such an approach is clearly inadequate; a national food agency is not the appropriate body to make single handed decisions about an international environmental issue that will affect the worlds oceans. It would set an unfortunate and potentially devastating precedent that must be avoided by all means.

In light of the risks and the unpredictable nature of genetically engineered fish, Greenpeace is calling for a global ban on any releases of genetically engineered organisms into the marine environment. Greenpeace International has issued an Appeal for GMO Free Seas to all governments and urges precautionary national and international action to protect the environment from this newly arising threat.

Greenpeace demands:

- No genetically engineered fish or other organisms should be released into the environment.
- The Biosafety Protocol to the Convention on Biological Diversity should apply to all GE organisms, including to GE fish grown commercially within contained facilities.

Selection of quotes and references from Science, Government and Industry bodies concerning Transgenic Fish

1. "The Panel recommends that a moratorium be placed on the rearing of GM fish in aquatic netpens." (6.13 page xii).

The report from the Expert Panel on the Future of Food Biotechnology was prepared by the Royal Society of Canada at the request of Health Canada, the CFIA, and Environment Canada. To view the Royal Society report entitled "Element of Precaution: Recommendations for the Regulation of Food Biotechnology in Canada" released Feb. 4/01, see: www.rsc.ca/foodbiotechnology/indexEN.html

2. "Industry and Government should introduce a moratorium on the rearing of GM fish in marine pens, and approval for commercial production should be conditional on the rearing of GM fish in land-locked facilities". 21 May 2001.

Copies of the report `The uses of genetically modified animals` can be obtained from the Science Advice Section, The Royal Society, 6 Carlton House Terrace, London SW1Y 5AG, e-mail science.policy@royalsoc.ac.uk or can be accessed on the tel 020 7451 2691, Society's web site at http://www.royalsoc.ac.uk.

3. Any transgenic fish kept in England and Wales should be confined to self- contained landbased and escape-proof facilities, with all necessary measures taken to ensure they cannot deliberately (by, for example, vandals) or accidentally be released into the natural environment.

UK - MAFF - Review of Salmon and Freshwater Fisheries - Government Response - Section 51. Available at: http://www.nerc.ac.uk/publications/oceans.htm#top

4. ... I can assure you that the Swedish Government share the concerns expressed in your letter on the use of GMOs in aquatic environments...

Minister of the Environment - Kjell Larsson - Letter to Greenpeace 11/4/01

5. Federation of European Aquaculture Producers (FEAP) code of conduct on GE Fish The FEAP does not endorse the use of genetically modified fish in aquaculture since it is concerned about the maintenance of the natural characteristics of the products, in addition to the environmental qualities of biodiversity. However, the results of genetic research may play an important part in the future development of global food production. The FEAP may review its position on this topic if such developments are acceptable to the consumer and do not pose any safety or environmental problems."

yours sincerely, Courtney Hough - General Secretary - http://www.feap.org/

6. FEDIS (Belgian Federation of retailers)

"As agreed, we're informing you of the position adopted on 9 May by the Commission 'food safety' of FEDIS re: international commercialisation of eggs from GM salmon. (....)

In the case of GM salmon, members of FEDIS cannot accept its commercialization because the risks of environmental damage have been clearly identified. It is now to competent authorities to verify them. The utmost precaution is therefore necessary. (...)

Besides, if one cannot say anymore that there is global overproduction of salmon, one can still say that supply meets demand, which remains high. Consequently, an insufficient production can certainly not be invoked to justify a demand for authorisation as the one introduced by A/F Protein. We will forward this standpoint to our European organization EuroCommerce, as well as to the Ag Min Jaak Gabriels."

Letter to Greenpeace May 2001 - The original in French is available upon request.

7. The Swedish Fish Industry Association (SFA)say the following:

SFA which represents 80% of Swedish industry and wholesalers in the fish area (ie wild fish and not cultivated) have on their Board discussed the issue of GE fish. The Board came to the conclusion that this is something the Association shall not occupy itself with. The Member companies are recommended under the present conditions to completely refrain from having anything to do with GE fish.

Kind regards Yngve Björkman Board Chair

8. The Swedish National Board of Fisheries (NBF)

The Swedish National Board of Fisheries is the competent authority for genetically modified living organisms (FIFS 1995:10). This means that anyone interested in activities of contained use, deliberate release or placing on the market of GMOs must make an application to the National Board of Fisheries (NBF). The NBF has so far not received any applications concerning activities with GM fish. At present there is very little interest from the fish farmers to GM fish. The NBF is well aware of possible risks with releasing GM fish... Letter to Greenpeace 19/4/01 from Hakan Westerberg & Maria Hellsten

The Swedish National Board of Fisheries - The release and propagation of fish – Strategies and background paper 19/2/01 - GM Fish.

...considering the great potential risks with GE fish such fish shall not be allowed to be released into natural waters or for food fish cultivation.

9. Swedish Aquaculture Association – 19/4/01

Excerpt from Ethical rules for the aquaculture association.

... The association do not accept GM fish which differ from natural populations and which can affect biodiversity and surrounding environment in a negative way....

10. Holland based Nutreco Aquaculture, the largest salmon farming company in the world. "We will never use transgenic eggs," says spokesman Vidar Julien, because "it is against nature."

Forbes February 19, 2001 Entrepreneurs; Pg. 106 Cannery Roe - Monte Burke

11. "We are not interested in working with (the genetically modified Atlantic salmon)," says Odd Atle Rygg, president of Pan Fish Sales. Pan Fish ASA is a Norwegian company that owns all the salmon farms in Washington and many in British Columbia. "We don't think we would be interested in the future, either," Rygg adds.

Tuesday, September 26,2000 - By Amy Martinez Starke of The Oregonian staff

12. "There are so many difficult questions raised by these fish, and we just don't know the answer to many of them," said Robert H. Devlin of Fisheries and Oceans Canada, who has also been raising and studying biotech salmon in British Columbia since the early 1990s. He

said that research is underway worldwide to genetically modify at least 25 aquatic species, ranging from flounder and carp to lobster and shrimp.

By Marc Kaufman, Washington Post Staff Writer - Tuesday, October 17 2000, Page A01

13. What they do in the lab changes [gene altered fish] quite a bit. Biologically, there is a big down side. We simply have no idea what this is about.

Katherine Kostow, State of Oregon conservation biologist

The Wave of the Future, Amy M. Starke, The Oregonian, September 26, 2000.

14. Here we are on the brink of remaking life on Earth through genetic engineering, and we do not have a thorough process for reviewing the environmental impacts. The [regulatory] system is full of holes.

William Brown, science advisor to former Interior Secretary Bruce Babbitt.

Gene-altered Catfish Raise Environmental, Legal Issues, Aaron Zitner, LA Times, January 2, 2001.

15. "We have to have absolute certainty that transgenic fish do not interact with wild stocks," Mr. Rhodes said. Edwin Rhodes, aquaculture coordinator for the National Marine Fisheries Service, said he was surprised to hear that the Food and Drug Administration was overseeing the environmental review regarding the new [gene altered] salmon and making decisions on such things as whether fish would be grown in net pens.

Altered Salmon Lead the Way to the Dinner Plate, but Rules Lag, Carol Kaesuk Yoon, NY Times, May 1, 2000.

16. "Environmental safety assessments should be done before these fish are stocked out on an industrial scale. It's time we got our policies together."

Dr. Eric Hallerman, fisheries geneticist at Virginia Polytechnic Institute

Altered Salmon Lead the Way to the Dinner Plate, but Rules Lag, Carol Kaesuk Yoon, NY Times, May 1, 2000.

17. "My sense is that the current system is not going to be OK and that there are going to have to be changes--or a whole new system put in," said Bill Knapp, a senior fisheries official with the U.S. Fish and Wildlife Service.

Gene-altered Catfish Raise Environmental, Legal Issues, Aaron Zitner, LA Times, January 2, 2001.

SCOTTISH QUALITY SALMON COMMENT ON TRANSGENIC SALMON EGGS FROM USA

In response to speculation that the American Food and Drug Administration may grant a licence for the sale, for human consumption, of salmon produced from transgenic salmon eggs, members of Scottish Quality Salmon remain totally opposed to the use and marketing of any such products.

As members of Scottish Quality Salmon, a new organisation based on the principles of independently certified, assured food production standards and environmental considerations, companies focus on producing a high quality product with whole chain assurance guarantees to meet the increasingly rigorous demands of consumers and retailers in the UK.

Notes to Editor:

1. Even if the FDA grants an appropriate licence for the USA, the Scottish Executive would be required to approve the import of such eggs to Scotland, as well as setting protocols for hygiene, health and other safety matters. It is thought to be unlikely that the Scottish Executive would grant such approvals given the current consumer resistance to GM/transgenic ingredients.

2. Scotland and British Columbia have already stated that this development of transgenic eggs is unacceptable to them. The International Salmon Farmers Association has also rejected the use of transgenic salmon in the industry. (emphasis added).

3. The Scottish salmon industry supports employment for 6,500 people, of whom 70% live in the remote, rural areas of the Highlands and Islands. The industry puts £1m every week into Scottish rural economies in the form of pay packets. Valued at £260m at farm gate, the Scottish salmon farming industry is bigger than the Highland beef and lamb industry put together.

Its value in economic, employment and social terms is vital to Scotland.

4. Scottish Quality Salmon represents companies involved in the production of Scottish salmon from feed manufacturers, salmon growers to smokers and processors to ensure whole chain assurance. Companies participate in the independently certified quality assurance chemes for salmon production and processing as well as the environmental management systems to ISO14001.

Their salmon is marketed under the Tartan Quality Mark in the UK and the prestigious Label Rouge in France.

Ends 11/4/00.

Issued by Julie Edgar, Scottish Quality Salmon, Communications Director,

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MEDIA RELEASE

B.C. Salmon Farmers reinforce stance against 'transgenics'

March 1, 2000 – The Board of Directors of the B.C. Salmon Farmers Association (BCSFA) has reinforced its position against the use of transgenic – or genetically modified – fish in aquaculture.

At a Board meeting on February 24, 2000 in Campbell River, B.C., BCSFA Directors voted unanimously to strengthen its policy against the use of transgenic fish in British Columbia. Membership in the BCSFA is contingent upon companies using only naturally bred salmon for food production in their operations.

The prohibition against the use of transgenics is also enshrined in the BCSFA Code of Practice – a voluntary code of operational guidelines enacted on January 1, 2000 to improve the environmental performance of B.C. salmon farms prior to the implementation of new aquaculture regulations in British Columbia.

"B.C. salmon farmers are wholly opposed to the use of genetically modified fish in aquaculture – both here in British Columbia and around the world," said BCSFA Executive Director Anne McMullin. "Transgenic fish are not used in commercial production today, and should not be used in the future unless science can prove that they present no danger to human health, wild stocks or the marine environment."

McMullin acknowledged the growing public concern about the use of genetically modified fish in aquaculture. She noted, however, that transgenic fish are not approved for use in aquaculture production anywhere in the world and that the international salmon farming industry has taken a firm stance against their use.

"There are activist groups that are using the future threat of transgenic fish in aquaculture as a means to oppose salmon farming as practiced today," McMullin said. "It's important that the public understands that the salmon farming industry shares its concerns about genetically modified fish, and has no intention to use transgenics now or in the future."

For more information:

Anne McMullin, Executive Director (604) 682-3077

EXECUTIVE SUMMARY OF THE CENTER FOR FOOD SAFETY'S GENETICALLY ENGINEERED FISH LEGAL PETITIONS

On May 9, 2001, the Center for Food Safety and a coalition of over 60 petitioners, consisting of consumer and environmental protection organizations along with fishing companies and fishermen, filed legal petitions with the U.S. Food and Drug Administration ("FDA"), U.S. Department of Interior ("DOI"), U.S. Department of Commerce ("DOC"), U.S. Department of Defense ("DOD"), and U.S. Department of Agriculture ("USDA") demanding a moratorium on the domestic marketing and importation of transgenic fish until FDA adequately addresses the impacts to the environment and human food safety. In addition, the petitions request that each federal agency with jurisdiction over an aspect of aquaculture take regulatory action consistent with the requests in the petition.

Currently, there are over thirty-five species of transgenic fish being developed around the world and at least one company, A/F Protein, that is presently requesting approval from the FDA to market transgenic fish to consumers as food. A/F Protein's transgenic fish contains a growth hormone gene from a chinook salmon and an antifreeze protein gene promoter from an ocean pout that keeps the growth hormone active. This transgene is injected into fertilized eggs. Due to the continuous production of the growth hormone gene, these transgenic fish grow as much as ten to thirty times faster than normal salmon.

While no federal laws specifically govern the regulation of genetically engineered animals grown for human consumption, the FDA has made the informal decision to regulate transgenic fish under its authority to review new animal drugs. In taking this action, transgenic fish producers must complete a New Animal Drug Application (NADA) and demonstrate the safety and effectiveness of these fish. Any such demonstration of safety must be shown through substantial evidence. Given the potential toxicity, allergenicity, and aquaculture diseases posed by the commercialization of transgenic fish, FDA must adopt a pre-market regulatory review that does not ignore these potential human health safety concerns. Additionally, the petition calls for the FDA to require mandatory labeling for any genetically engineered fish products sold for human consumption.

Although FDA has regulatory control over human food safety issues, FDA does not have an expertise in the review of marine ecosystem impacts that will be caused by the introduction of transgenic fish into commercial aquaculture. Therefore, petitioners are also demanding that FDA retain the moratorium until the DOI, DOC, DOD, and USDA address the environmental impacts and implement the necessary regulatory requirements as required by each agency's statutory mandates.

Unintended releases of transgenic fish into the world's waters may cause significant impacts to the environment and endangered species. New studies have shown that transgenic fish are more aggressive, eat more food, and will attract more mates than wild fish. In addition, these studies show that although transgenic fish will attract more mates, their offspring will be less fit and less likely to survive. As a result, scientists predict that transgenic fish will cause some species to become extinct within only a few generations.

Once one species becomes extinct, other species will likely be affected. There are already 114 species of fish, including Atlantic salmon, that are listed under the Endangered Species Act ("ESA"). Allowing transgenic fish in ocean pens may significantly increase this number of listed species.

The following petitions have been filed simultaneously with the FDA petition:

A joint petition to DOI and DOC requesting a ban on the commercialization of transgenic fish or in the alternative a ban on the use of ocean pens in accordance with the Endangered Species Act, Lacey Act, Aquatic Nuisance Species Act, and the National Aquaculture Policy Act.

A petition to DOD requesting a ban on the use of ocean pens in accordance with the National Environmental Policy Act, Endangered Species Act, and Rivers and Harbors Act.

A petition to USDA requesting specific requirements for enclosed aquaculture facilities in accordance with the Aquaculture Policy Act, including consulting with the Environmental Protection concerning the proper disposal of waste water from enclosed land based systems.

For more information on these legal petitions contact the Center for Food Safety. Complete copies of the petition are available on-line at www.centerforfoodsafety.org and www.gefish.org

Resolution of the American Society of Ichthyologists and Herpetologists

The American Society of Ichthyologists and Herpetologists (an organisation dedicated to the scientific study of fishes, amphibians and reptiles) passed the following resolution at their annual meeting on June 20, 2000, in La Paz, Mexico.

Whereas current research indicates the presence of reduced fitness and abnormalities in salmon into which non-salmonid genes have been introduced (transgenic salmon), and Whereas a high incidence of escape of cage-reared salmonids is well documented, and Whereas salmonids that are altered to contain extra copies of growth hormone genes and other genes are a threat to natural populations through genetic pollution, leading to depressed fitness, and Whereas transgenic salmon also represent potential predators and competitors with negative effects on native fishes, many of which are threatened or endangered,

Therefore be it resolved that the American Society of Ichthyologists and Herpetologists petitions the United States Food and Drug Administration, Environmental Protection Agency, Department of the Interior, Department of Agriculture, Department of Commerce, and appropriate state agencies, as well as Canadian Federal and Provincial agencies, to establish a system for oversight and responsibility to regulate development of transgenic fishes.

The American Society of Ichthyologists and Herpetologists strongly favors a moratorium on creation or marketing of transgenic salmonids until it is firmly established that such fish will not gain access to natural waters, by accident or intent.

Be it also resolved that we recognize clearly problems of world hunger and the need to work toward solutions to food shortages, but evidence indicates that transgenic salmonids are neither an effective nor ecologically safe solution to these problems. Therefore, we also suggest that adequate research funds be directed toward sustainability of aquatic ecosystems as an investment toward solution to these problems.

The resolution has been forwarded to 24 U.S. and Canadian governmental agencies.

Examples of GM fish (or aquatic GMOs or transgenic species) being tested for use in aquaculture:

(From the report - GENETICALLY MODIFIED ORGANISMS AND FISHERIES, by -Jacques Diouf, FAO Director-General 7 March 2000)

Species	Foreign gene	Desired effect and	Country
Atlantic salmon	AFP AFP salmon GH	Cold tolerance Increased growth and feed efficiency	United States, Canada United States, Canada
Coho salmon	Chinook salmon GH + AFP	After 1 year, 10- to 30- fold growth increase	Canada
Chinook salmon	AFP salmon GH	Increased growth and feed efficiency	New Zealand
Rainbow trout	AFP salmon GH	Increased growth and feed efficiency	United States, Canada
Cutthroat trout	Chinook salmon GH + AFP	Increased growth	Canada
Tilapia	AFP salmon GH	Increased growth and feed efficiency; stable inheritance	Canada, United Kingdom
Tilapia	Tilapia GH	Increased growth and stable inheritance	Cuba
Tilapia	Modified tilapia insulin-producing gene	Production of human insulin for diabetics	Canada
Salmon	Rainbow trout lysosome gene and flounder pleurocidin gene	Disease resistance, still in development	United States, Canada
Striped bass	Insect genes	Disease resistance, still in early stages of research	United States
Mud loach	Mud loach GH + mud loach and mouse promoter genes	Increased growth and feed efficiency; 2- to 30-fold increase in growth; inheritable transgene	China, Korea, Rep.
Channel catfish	GH	33% growth improvement in culture conditions	United States
Common carp	Salmon and human GH	150% growth improvement in culture	China, United States

		conditions; improved disease resistance;	
		tolerance of low oxygen level	
Indian Major carps	Human GH	Increased growth	India
Goldfish	GH AFP	Increased growth	China
Abalone	Coho salmon GH + various promoters	Increased growth	United States
Oysters	Coho salmon GH + various promoters	Increased growth	United States
FISH TO OTHI	ER LIFE FORMS		
Rabbit	Salmon calcitonin- producing gene	Calcitonin production to control calcium loss from bones	United Kingdom
Strawberry and potatoes	AFP	Increased cold tolerance	United Kingdom, Canada

Note: The development of transgenic organisms requires the insertion of the gene of interest and a promoter, which is the switch that controls expression of the gene.

AFP = anti-freeze protein gene (Arctic flatfish). GH = growth hormone gene.