

# Unilever (Breyer's & Good Humor) Using Genetical

by Paris Reidhead

## Summary:

### **Genetically-modified fish proteins in Breyer's Ice Cream**

Unilever, the British-Dutch global consumer marketing products giant, is the largest producer of ice cream and frozen novelties in the U.S. Unilever's brands sold in the U.S. include Breyer's ice cream, Ben & Jerry's ice cream, Klondike ice cream bars, and Popsicle products.

Specifically: Breyer's Light Double-Churned, Extra Creamy Creamy Chocolate ice cream, as well as a Good Humor ice cream novelty bar, contain the genetically-modified fish "antifreeze" proteins.

Unilever's scientists have patented, and the company is using ice cream products sold in the U.S., Australia and New Zealand, "antifreeze" protein substances from the blood of the ocean pout (a polar ocean species). That substance is produced, through genetically-modified (GM) yeast, in large vat batches. Unilever's ice cream products that contain "ice structuring protein" (ISP) contain the material at the level of .01% of finished product volume.

Human "safety" testing? Like many other genetically-modified materials in our foods, the federal Food and Drug Administration (FDA) looks like it has been asleep at the switch. Long story short on the human "safety" protocols submitted by Unilever to FDA: human allergy testing was conducted on **codfish** blood proteins, not on blood proteins from the ocean pout. Codfish and the ocean pout do not even belong to the same sub-class, in the "Order of Species".

In Great Britain, Unilever is seeking approval from the government food safety agency for approval to use GM-derived fish "antifreeze" proteins in ice cream products. Food safety watch-dogs in Great Britain are in an uproar over such proposals.

Unilever touts the benefits of this GM fish "antifreeze" protein as "crystallization" when ice cream products warm (above proper temperatures) and then are refrozen. In truth: the fish "antifreeze" proteins look like one more trick in the corporate bag of tricks to produce cheaper products ... without regard to serious human safety considerations.

"Antifreeze" proteins protect cold-climate amphibians and fishes.

Like all amphibians, frogs are cold-blooded. Frogs' body temperatures change with temperature of their surroundings. Some frog species hibernate in the mud at the bottom of a pond during winter, perfectly still and barely breathing.

Canada's wood frog can live north of the Arctic Circle, surviving for weeks in a frozen state. This frog uses blood glucose as a type of antifreeze, concentrating it in vital organs to protect them while the rest of the body freezes.

Similarly, certain fish in polar oceans survive winter in suspended animation, using special "antifreeze proteins" in their circulatory systems.

During the past two years, these fish "antifreeze proteins" have become an arrow in the quiver of corporate food biotechnology.

Unilever—the British/Dutch-owned global consumer products giant—is using biotechnology to produce a protein isolated from fish blood. In the U.S., Australia and New Zealand, Unilever sells ice creams containing this GM product, called ice structuring protein (ISP). Unilever's patented technology permits development of low-calorie, lowfat ice creams that taste like full-fat products. The lower the fat level in ice cream, the more likely they are to become granular when refreezing after partial thawing.

### **From ocean pout fish, aka conger eel, to your ice cream**

The blood protein originally comes from the eel-like, ocean pout fish (*Macrozoarces americanus*), which survives extreme cold at the bottom of polar seas. It's not practical to extract the protein directly from the ocean pout, Unilever's patent explains. Instead, the company processes ISPs by altering the genetic structure of a strain of baker's yeast to produce the novel protein during batch fermentation. This fish-derived "antifreeze protein" is cultivated in huge vats as a brown liquid.

This GM material is added to the ice cream mix. ISP lowers the temperature at which ice crystals form, eliminating the granular texture from "refreezing". A stiff and solid mixture results by using less cream. An application to use the new technology, involving the genetic modification process, is now being reviewed by the Food Standards Agency (FSA)—Britain's version of FDA—which is inviting public comment.

### **ISPs approved in 2005; used in some Unilever ice cream products**

**Unilever gained approval from the federal Food and Drug Administration (FDA) to sell ice cream products containing GM ISPs in June 2005. Incredibly, the U.S. has no regulation requiring labeling of GM products or ingredients in human foods.**

In Great Britain, very vocal public opponents include members of the anti-GM foods Independent Science Panel members, who remain unconvinced of this controversial new GM technology. These scientists assert, contrary to Unilever's claims, there is no evidence that the transgenic ice-structuring protein is identical to the protein produced in pout fish.

"The transgenic protein appears to have the glycosylation pattern of yeast, making that protein a unique antigen," said Joe Cummins, one such scientist, in a press release. "Even though allergenicity was studied in a cursory way, there is clear precedent for studying inflammation comprehensively in the long term in both young and older animals, before exposing the European public to the transgenic ice cream."

Unilever retorts that no GM material remains in the final product; rather the process used to create the protein merely involves a GM element. But Friends of the Earth food campaigner Clare Oxborrow said, "At a time when

more and more consumers want to choose unadulterated food, it's disappointing to see Unilever investing in this unnecessary development in overly processed food."

On July 4, 2006, Prof. Cummins wrote in the GM Watch website:

(<http://www.gmwatch.org/archive2.asp?arcid=6706>)

that Unilever has been selling GM ice cream in the U.S., with FDA approval. Unilever's Good Humor is a major producer of ice cream bars and other frozen novelty products mainly targeted to young children. The applications for approval of GM ice cream have all ignored the impact of GM ice cream on children.

In the FDA GRAS (Generally Recognized As Safe) application, Unilever's main focus of safety was the allergenicity of the ice structuring protein from the pout fish. The main test was to examine effect of the ice structuring protein (ISP) on blood from 10 people who had allergies to **codfish**. There was no indication that the blood contained allergic response antibodies to the ISP. Sound science? **Codfish and ocean pout fish differ greatly. They diverge in the "Order of Species" at the sub-class level. An elephant and a platypus (an egg-laying marsupial) have more in common with each other, in the "Order of Species", than do codfish and ocean pout!**

This "safety" experiment seems very strange to Professor Cummins because it tested blood that is allergic to cod. That allergen is a calcium-binding protein called parvalbumin which is unrelated to pout fish ISP. Cod has an ISP but that protein is not at all related to the pout fish ISP (biotech product licensed by Unilever) in the ice cream.

Quoting Cummins, "Unilever's main allergy test seems to be a dummy test that could never produce results relevant to the GM ice cream, it could only provide results showing no allergy; in other words it seems rigged to produce favorable results. Unilever provided a GRAS panel of experts who ignored the fecklessness of the allergy tests."

### **Uproar in Great Britain focusing issue among global anti-GM activists**

According to Britain's Independent Science Panel, GM fish antifreeze protein is potentially able to cause inflammation and should not be approved without comprehensive tests. The Panel is strongly petitioning the FSA to oppose approval of Unilever's application for British government sanction of this GM protein.

Unilever's ISP proposal is now open for public comment in that country.

The transgenic protein produced in yeast was designated ISP Type III HPLC 12 glyco-ISP. The preparation tested by Unilever contained peptides from yeast and sugars along with the recombinant protein. Unilever conducted a sub-chronic feeding test of the preparation on rats by force-feeding for three weeks, as well as a battery of genotoxicity tests that proved to be negative. A series of tests that included those suggested by the World Health Organization for allergies were carried out, along with tests for reactivity with serum obtained from a few people allergic to fish.

### **British group claims FDA-approved human "safety" tests are irrelevant**

Professor Cummins detailed how protein production in yeast (destined for human consumption or therapy) is beset with the problem of secondary modification of the proteins by glycosylation. The human immune system may well recognize the yeast modified proteins as antigens. Long story short, Cummins asserts that respect for the complexity of this biochemical process has been trivialized by Unilever's and FDA's rush to establish GRAS status for pout ISPs. Are the cursory studies on allergenicity carried out by Unilever's scientists on this GM protein used in ice cream adequate to rule out allergy and other immune reactions in the tens of millions of people that will consume the ice cream? The Independent Science Panel thinks not.

Because use of ISPs in ice cream is not labeled, it would be all the more difficult to recognize any human health problems resulting from ISP use, in much the same manner as it is difficult to directly correlate increased human cancer rates with recombinant bovine growth hormone residues in cows milk in the U.S.

### **Despite Dan Quayle, biotech foods merit no "all safe" presumptions**

In the early 1990s, then vice-president Dan Quayle (the ex-newspaper publisher who could not spell the word "potato") headed the White House Competitiveness Council, which declared, as U.S. policy, that GM foods were virtually the same as their natural counterparts and needed no special food-safety testing. That presumption is in error.

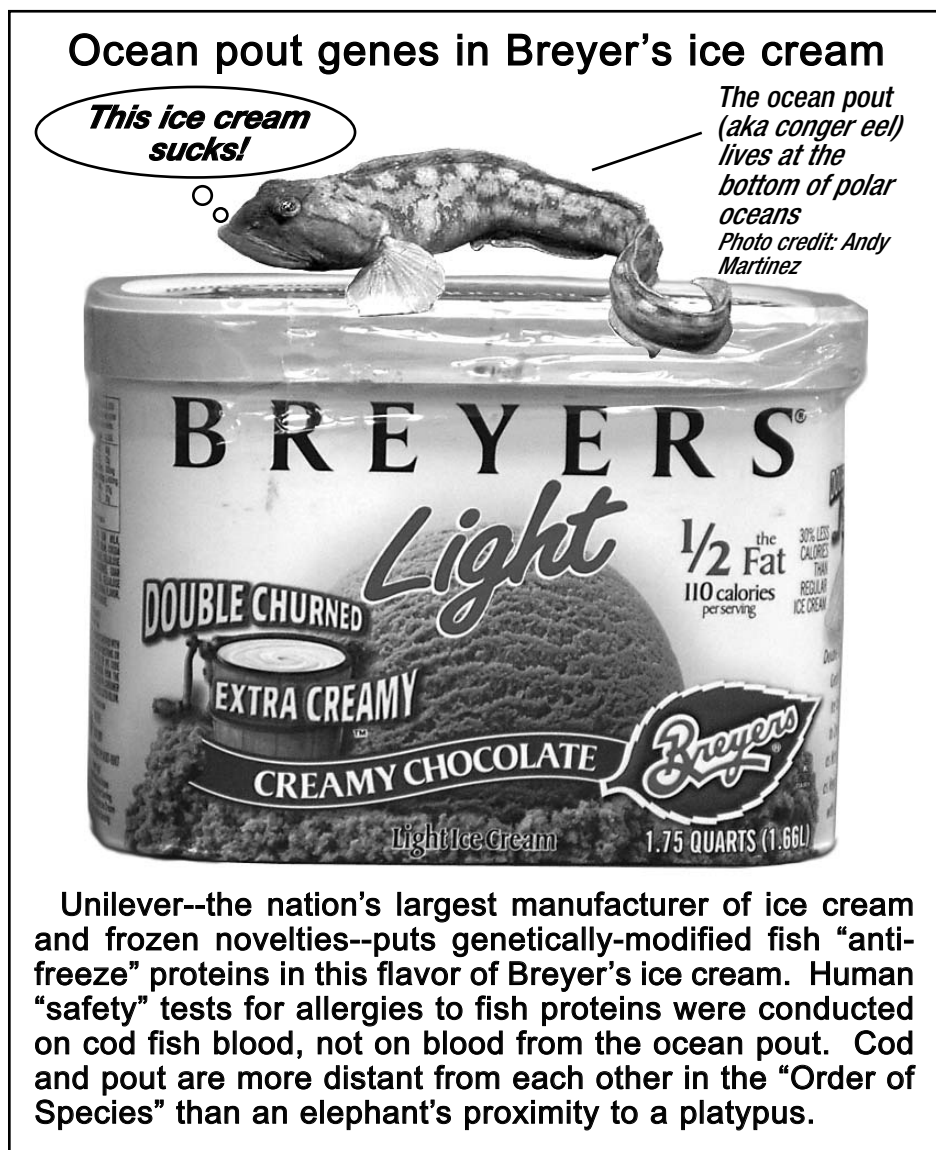
Biotech foods do have human safety issues. Recall that transgenic expression of a bean gene in peas turned into a strong immunogen, resulting in debilitating—even fatal—lung inflammation in mice. That response was related to the glycosylation pattern of the transgenic protein. These thoughts were expressed by Mae-Wan Ho in a *Science in Society* article (November 2005), entitled "Transgenic pea that made mice ill".

Also in the early 1990s, there was a situation in which soybeans were genetically modified with Brazil nut genes to increase lysine levels in soy. Persons allergic to nut proteins proved allergic to these soybeans infused with a Brazil nut gene: end of experiment.

### **Potential "immunological time bomb"**

In the opinion of the Independent Science Panel, Unilever has not conducted the inflammation tests, even though the bulk of pertinent scientific literature stresses that pout fish antifreeze protein is immunologically active. There is also the question of latency, as some chronic inflammatory diseases emerge gradually, so that there is a potential cascade effect that when triggered, will lead to auto-immune effects that could affect any organ. Again quoting Prof. Cummins, "Without long term testing, we could be letting off an immunologi-

# Genetically-Modified Fish “Antifreeze” Protein in Ice Creams



cal time bomb." In conclusion, contrary to the claims of Unilever, there is no evidence that the transgenic ice structuring protein is identical to the protein produced in pout fish. The transgenic protein appears to have the glycosylation pattern of yeast, making that protein a unique antigen. Since, as stated earlier, allergenicity was only studied superficially (in his opinion), an urgent need exists for studying inflammation comprehensively over a much larger time frame.

## Reviewing Unilever's patent and GRAS applications for ISP

According to the website of the U.S. Patent and Trademark Office, the Unilever Intellectual Property Group, of Englewood Cliffs, NJ, on June 16, 2005, applied for a patent for ice structuring protein. It was assigned U.S. Patent number 20050129810; its inventors were Nigel Lindner, Jon Oldroyd, Andrew Sztchlo, and Deborah Towell.

The patent application abstract reads: "A frozen confectionery product is provided, comprising a plurality of discrete water ice confections, each discrete water ice confection being able to contact directly other discrete water ice confections in the product, which water ice confections comprise an ice structuring protein (ISP), at least 6 wt % solids and have an average volume of less than 1 ml."

Further down in the patent office description, paragraph 7 continues: "A product according to claim 1 wherein the ISP is a fish type III ISP. Examples of fish (type III) ISP materials are... obtainable from Ocean pout, Atlantic wolffish, Radiated shanny, Rock gunnel and Laval's eelpout." (Editor's note: Cod fish is not mentioned!)

Besides gaining a patent for ISP, Unilever's invention had to earn GRAS status from FDA. I wanted to find documentation for Unilever's GRAS designation. With the help of Patty Lovera, a lobbyist for the Washington, D.C.-based Food and Water Watch, I was able to document Unilever's GRAS application for ISP on FDA's Web site. Here are the high spots of a reply written by Alan M. Rulis, PhD (Office of Food Additive Safety) to Ms. Nancy Schnell, Deputy General Counsel for Marketing and Regulatory of Good Humor/Breyers (a Unilever Company):

"The Food and Drug Administration (FDA) is responding to the notice, dated October 18, 2002, that you submitted in accordance with the agency's proposed regulation, proposed 21 CFR 170.36 [(62 FR 18938; April 17, 1997; Substances Generally Recognized as Safe (GRAS); the GRAS proposal]. FDA received the notice on October 23, 2002, filed it on October 30, 2002, and designated it as GRAS Notice No. GRN 000117."

"The subject of the notice is ice structuring protein (ISP) preparation from *Saccharomyces cerevisiae* carrying a gene encoding an ISP derived from ocean pout (ISP preparation). The notice informs FDA of the view of Good Humor-Breyers, a Unilever company (Unilever) that ISP preparation is GRAS, through scientific procedures, for use as a texturizer in frozen novelty desserts to provide ISP at a level of 0.01 percent in the finished product.

...  
"Based on the information provided by Unilever, as well as other information available to FDA, the agency has no questions at this time regarding Unilever's conclusion that ISP preparation is GRAS under the intended conditions of use. The agency has not, however, made its own determination regarding the GRAS status of the subject use of ISP preparation. As always, it is the continuing responsibility of Unilever to ensure that food ingredients that the firm markets are safe, and are otherwise in compliance with all applicable legal and regulatory requirements."

FDA relied solely on Unilever sponsored "safety testing" research for the GRAS determination on ISPs. As the British critics have noted, the actual fish blood antifreeze protein studied was from a cod, not an ocean pout. Was the GRAS safety-testing irrelevant?

## Competitor Edy's/Dreyer's (with a "D") tells *New York Times*: "Not us!"

The "Dining In" section of the July 26, 2006 issue of *The New York Times* carried a frivolous article about fish "antifreeze" proteins in lowfat ice cream products by reporter Julia Moskin. That article was the starting point for researching this work for *The Milkweed*. As I began contacting ice cream manufacturers, it became clear that others quickly disassociated themselves of any connection with ISPs in their ice cream products!

Credit Angie Brem from Edy's/Dreyer's (with a "D", not Breyer's with a "B") with being able to hand off slicker than ol' Roger Staubach when he played football at the Naval Academy. Within hours of receiving my e-mail, Ms. Brem phoned me and emphatically explained, "Edy's/Dreyer's doesn't use the ... fish ice structuring protein at all."

Edy's/Dreyer's (with a "D", not a "B") uses a low-temperature, extrusion for that company's "Slow Churned Rich and Creamy" ice creams. Undoubtedly, *The New York Times*' use of a picture of Edy's ice cream caused Ms. Brem many headaches. Most helpfully, she asked me if I had confused her company with Breyer's (with a "B") and happily provided me with the competitor's phone number ... and said she'd send me some discount coupons for Edy's/Dreyer's (with a "D") ice cream.

That *NYT* article sparked additional media interest ... and even forced Unilever subsidiary Ben & Jerry's to run for protective cover.

## Ben & Jerry's: "We would not dream of ... anything like that ..."

According to the August 5, 2006 issue of *Growers and Grocers*, Ben & Jerry's, the self-styled "all natural" ice cream manufacturer, has broken ranks with food giant Unilever amid controversy about GM ice cream. A spokesperson for Ben & Jerry's said: "We would not dream of including anything like that in our products. One of the biggest problems is that we are affected by Unilever's actions even though they are nothing to do with the way that we behave. The fact that we are not using this GM ingredient shows that we are not following all of their decisions."

Obviously, under Unilever's giant corporate ice cream tent, there is discord about the wisdom of using genetically-modified fish "antifreeze" proteins in ice cream. Ironically, Ben & Jerry's was one of the first U.S. dairy processors to come out with "rbGH-Free" labels—prohibiting use of milk and dairy products from herds whose cattle were injected with Monsanto's recombinant bovine growth hormone.

## Unilever's corporate p.r. flaks: unhelpful answering ISP questions

The rapid denials from Edy's/Dreyer's and Ben & Jerry's starkly contrast to repeated requests for information sent by e-mail and telephone calls to Unilever's Good-Humor/Breyer's operations, based in Green Bay, Wisconsin.

Corporate run-around and failure to get back to this writer in a timely fashion are the two phrases to describe the response of Unilever public relations personnel to inquiries about GM fish "antifreeze" proteins in their ice cream products.

We must credit Unilever's public relations team for belatedly informing me that only the Breyer's Light Double-Churned, Breyer's Light Double-Churned, Extra Creamy Creamy Chocolate ice cream contains GM fish "antifreeze" proteins. They omitted mention of Good Humor novelty cited in the *NYT* article.

## More of the same old "stuff" ...cheaper ingredients, scary biotech

What ever happened to good, old-fashioned ice cream ... made from dairy ingredients, sugar, and natural flavors?

Unilever's including unlabeled, genetically-modified, fish "antifreeze" proteins in our ice cream is more of the same old story: corporate arrogance and disrespect for consumer preferences and human safety in pursuit of cheaper ingredients that "dumb" down the quality and nutritional value of foods.

Proof? Unilever belongs to the International Ice Cream Association, a Washington-based trade lobby, that is proposing to FDA that any milk products from any mammalian species be allowed for use in U.S. ice cream production. What they really want is to use Third World water buffalo milk ingredients—fat and proteins—in ice cream, instead of good old cow's milk from U.S. dairy farms!

It's doubtful that the fish "antifreeze" gene's greatest economic benefit to Unilever is blocking ice-crystal formulation. More likely is that this "fish gene" (by way of yeast) is a source of cheaper ice cream costs. Lowfat ice creams that have the texture of full-fat ice creams can be sold cheaper ... particularly to restaurants and food-service outlets, where the consumer never sees the label and has no way of knowing that the ice cream being served contains genetically-modified fish "antifreeze" proteins.

Application of cheaper, genetically-modified food ingredients ... regardless of human safety attributes ... boost corporate profits. "Human safety"? Let me repeat that the codfish, whose blood proteins Unilever's scientists tested for human allergenicity, has less proximity to an ocean pout fish than an elephant has to a platypus. And the big corporations accuse biotech critics of not using "Sound Science"!

It's all about cheaper ingredients, lack of consumer knowledge, and corporate profits.

**Paris Reidhead is an organic food activist who lives in Hartwick, New York.**