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Illegal experimental GE Rice from China: Now entering Europe's Food chain September 2006

INTRODUCTION

Genetically engineered (GE) rice, unapproved for human consumption has been found in food products in France, Germany and the UK. This in itself is cause for concern but when the strain of illegal GE rice is an experimental one that contains a toxin with potential allergenicity to the public then this is truly alarming for a staple food that feeds half the worlds population.

The Key Finding – illegal GE rice contamination in France, Germany and the UK

The following table provides details of the positive test results found in France, Germany and the UK. All tested positive for the same illegal GE Bt rice originating in China.

Country	Product	Brand and product details	Importer	Comment
France	Rice sticks	Cock Brand Best before 15/2/08	Tang Brothers	Tang brothers are one of the biggest importers of Chinese food products in the EU www.tang-freres.com
Germany	Rice sticks	Swallow sailing Expiration 30/3/08	Heuschen & Schrouff	Heuschen and Schrouff are Dutch importers that distribute rice products to 25 EU countries. http://www.heuschenschrouff.com/
UK	Quandong Rice vermicelli Rice vermicelli Amoy (Xiamen) Kongmoon Rice Stick	Brotherhood Best before 20/1/08 30/4/08 Bar code 6927585 272308 Best before 09-01-2008 (production date 10-01-2006)	Seewoo Foods Ltd Seewoo Foods	Seewoo also claim to be the biggest supplier of Asian food products in the UK and one of the biggest in the EU http://www.seewoo.com./

This is the first time ever that illegal GE rice has been found outside the People's Republic of China. It indicates that the scale of GE rice contamination in China, which Greenpeace has exposed over the last year, is much wider than previously estimated, and also indicates that processed food products might be a significant source of illegal GE rice contamination in other countries.

The Health Risk

GE insect resistant rice has not been approved for cultivation anywhere in the world. There is no publicly available human food safety assessment available for any GE insect resistant rice. This GE rice is still an experimental GE crop, so precise information on what kinds of genes have been inserted, locations of the inserts and copy numbers are not known. It is known from PCR and immunological testing that it contains a Cry1Ac protein, or possibly a fusion Cry1Ab/Cry1Ac protein. Studies with the specific toxin produced in the illegal rice (and which was found in one of the samples) show that there are concerns about its potential human allergenicity. It has been found in some studies that the Cry1Ac protein has induced allergenic-like reactions in mice. As a staple food that is usually consumed in less processed forms and in large quantities, the safety concerns with illegal GE rice are much higher than in soybeans or corns that are usually consumed in highly processed forms.

Research¹ considering the immunogenicity of the Cry1Ac² toxin indicates that:

- Cry1Ac protoxin is a potent immunogen.
- The protoxin is immunogenic by both the intraperitoneal (injected) and intragastric (ingested) route.
- The immune response to the protoxin is both systemic and mucosal.
- Cry1Ac protoxin binds to surface proteins in the mouse small intestine.

Rice is the most important staple food crop in the world. On average, rice provides 30% of caloric and 19% of protein intake in China³. On top of all the existing risks associated with GE crops and foods the protein Cry1Ac poses even more alarming health concerns. Although the toxins may be partially degraded during cooking of rice, limiting their possible allergenic or toxic potential, this is yet to be confirmed by thorough studies. Those studies must include the types and quantities of rice products consumed by infants and other susceptible populations. As rice powder is also used by the cosmetic industry

¹ Moreno-Fierros, L. García, N. Gutiérrez, R. López-Revilla, R. Vázquez-Padrón, R.I. (2000). Intranasal, rectal and intraperitoneal immunization with protoxin Cry1Ac from *Bacillus thuringiensis* induces compartmentalized serum, intestinal, vaginal and pulmonary immune responses in Balb/c mice. *Microbes Infect* 2(8): 885-90; Vázquez-Padrón, R.I, Moreno-Fierros, L. Neri-Bazán, L, de la Riva, G.A & López-Revilla, R. (1999). *Bacillus thuringiensis* Cry1Ac protoxin is a potent systemic and mucosal adjuvant. *Scand J Immunol* 49: 578-584; Vázquez-Padrón, R.I Moreno-Fierros, L. Neri-Bazán, L, de la Riva, G.A & López-Revilla, R. (1999). Intragastric and intraperitoneal administration of Cry1Ac protoxin from *Bacillus thuringiensis* induces systemic and mucosal antibody responses in mice. *Life Sciences* 64(21): 1897-1912; Vázquez-Padrón, R. I., Moreno-Fierros, L. Neri-Bazán, L. Martínez-Gil, A.F., de la Riva, G.A. & López-Revilla, R.. (2000). Characterization of the mucosal and systemic immune response induced by Cry1Ac protein from *Bacillus thuringiensis* HD 73 in mice. *Braz J Med Biol Res* 33: 147-155; Vázquez-Padrón, R. I., González-Cabrera, J., García-Tovar, C. Neri-Bazán, L., López-Revilla, R., Hernández, M., Moreno-Fierros, L. & de la Riva, G.A. (2000). Cry1Ac protoxin from *Bacillus thuringiensis* sp. kurstaki HD73 binds to surface proteins in the mouse small intestine. *Biochem Biophys Res Comms* 271: 54-58.

² The GE Bt rice illegally contaminating Chinese rice market contains a Cry1AC gene or part of a Cry1Ac gene

³ Rice Today, September 2002. Rice Facts. Essential food for the poor. <http://www.irri.org/publications/today/pdfs/1-2/facts1-2.pdf> <28th October 2004>

possible allergenic risk through respiratory and skin exposure also needs to be assessed. The allergy concerns in relation to Cry1Ac or the fused protein in GE rice requires extreme caution and attention especially as rice is a staple food crop.

Learning From Prior GE Contamination

A similar GE contamination case in the USA in 2001 resulted in a recall and an estimated \$1 billion bill amid concerns of potential allergenic reactions after illegal GE maize (StarLink) entered the food chain. Although StarLink was grown on less than one percent of all US maize fields, it was co-mingled with much larger quantities of maize.⁴ It resulted in the recall of nearly 300 contaminated food products⁵ in the USA, and it was also found in US maize export markets such as Japan. US government officials estimated that it might take four years to get StarLink out of the US food and seed supply. Three years after the scandal, approximately 1% of samples sent to USDA testing labs were still found to contain StarLink.⁶

StarLink maize, like the GE rice from China, had not been approved for human consumption.

Last year, the discovery that Bt10, an unauthorized GE maize, had been mixed with commercial varieties, resulted in import bans and a subsequent testing and certification requirement in both the EU and Japan for all US maize imports.

In August 2006, it was announced that an unauthorized version of Bayer's Liberty Link rice was detected in commercial rice in the United States. It appears that the contamination was discovered as early as January 2006, but no trading partners were notified. As soon as the story was released by the USDA and Bayer, Japan immediately announced testing and certification requirements for all US imports of long grain rice. On August 23, the European Commission imposed similar requirements. Since the EC and Japanese announcements, one ship has been detained in Rotterdam, its 20, 000 ton rice shipment suspected of being contaminated,⁷ and another ship, held in New Orleans has been confirmed to contain Bayer's Liberty Link contamination.⁸ Already four class action lawsuits have been filed against Bayer for damages as a result of the contamination, which caused immense losses to farmers as a result of an immediate and severe decline in US rice prices.⁹

⁴ USDA doesn't know how StarLink tainted 1998 corn. Reuters News Service November 23, 2000

⁵ FDA Enforcement Report 00-44 1 November 2000 at <http://www.fda.gov/bbs/topics/ENFORCE/ENF00666.html> as of December 5, 2000

⁶ Jacobs, P. 2003. *Traces of contaminated grain still showing up in corn supply*. 30 November. San Jose Mercury News.

⁷ Unauthorised U.S. GMO rice arrived in Netherlands, REUTERS, Thu Aug 31 2006
http://today.reuters.com/stocks/QuoteCompanyNewsArticle.aspx?view=CN&storyID=2006-08-31T102437Z_01_BRU004876_RTRIDST_0_FOOD-EU-US-RICE-URGENT.XML&rpc=66

⁸ Louisiana Rice Tests Positive for GMO Liberty Link, September 1, 2006.
<http://www.planetark.org/dailynewsstory.cfm/newsid/37911/story.htm>

⁹ Arkansas farmers file 4th lawsuit over genetically engineered rice. Associated Press, September 2 2006
<http://www.pbcommercial.com/articles/2006/09/02/ap-state-ar/d8jss4282.txt>; see also Bayer faces more lawsuits over GMO rice

REUTERS, Aug 29 2006 By Lisa Haarlander

http://today.reuters.com/news/articlebusiness.aspx?type=ousiv&storyID=2006-08-29T184418Z_01_N29437472_RTRIDST_0_BUSINESSPRO-FOOD-BAYER-RICE-DC.XML&from=business

Background Information

As of June 2006, no varieties of genetically engineered (GE) rice have been approved in China. However, in early 2005, GE rice seeds were found by Greenpeace to have been sold and grown commercially for a number of years in central China's Hubei province that is about one third of the size of France. The GE rice is illegal, and has not been approved as safe for either human consumption or the environment. It has entered the Chinese food chain and environment, and has now contaminated Chinese rice exports.

Following the first exposure of the illegal GE rice contamination, more cases of contamination have been revealed. The cases involve almost all parts of the food chain, from wholesale markets to processed food products. In August 2005, unpackaged rice in a Carrefour store was found to contain illegal GE rice. GE rice was also found in wholesale markets and in ParknShop store in Guangzhou over 1000 miles away from Wuhan. The most recent contamination case involved rice cereal products produced by HJ Heinz. In March 2006, independent laboratories in Germany and Hong Kong found genetically engineered rice in Heinz's Baby Rice Cereal sold in Beijing (approx 1500 miles away from Wuhan the main source of the illegal rice genetic contamination), Guangzhou and Hong Kong

The illegal GE rice has had a foreign Bt gene inserted to make it resistant to pests, it produces a toxin that so far has only been used commercially in non-food crops. For several years, large scale field trials with this GE rice have been conducted by scientists of the Huazhong Agriculture University in Wuhan, the provincial capital of Hubei.¹⁰ Greenpeace research has also revealed conclusive evidence that the university is the source of the contamination. Two GE rice seed samples were advertised as a product of New Technology Company of Huazhong Agriculture University, a company owned by the University.¹¹

Implications for the European Food Market

The finding of illegal GE rice in Europe might be just the tip of the iceberg.

As China is one of the world's largest exporters of rice, Chinese rice and rice products are likely to be found in countries all over the world. The contamination scandal may have significant trade and market impacts. In 2005, China exported rice to the following countries: Japan, Korea, Russia, Germany, UK, France, Netherlands, Spain, Ukraine, Bulgaria, Liberia, Hong Kong and other countries.

The situation is much more complicated when it comes to processed food products containing rice ingredients. As an ingredient, rice is used in a great number of products including snack foods, baby foods, beer and yogurt. It is still unclear how many food products containing rice are imported from China to Europe. There are also cases where

¹⁰ Tu, J., et. al 2000. Field performance of transgenic elite commercial hybrid rice expressing *Bacillus thuringiensis* delta-endotoxin. *Nature Biotechnology* 18: 1101-1104.

¹¹ Government Statement on the GE Rice Issue in Hubei Province, Aug 10, 2005 Source: *Hubei Daily*

European food companies source rice ingredients from China for food production in Europe.

The USA is the only country in the world that has approved cultivation of GE rice, a “Liberty” herbicide tolerant GE rice, although no commercial GE rice crops have been planted due to fears of consumer and market rejection. No other country has approved the commercial growing of GE rice.

Responsibility: Who is to Blame?

The detection of illegal GE rice in Europe is another alarming case demonstrating that the GE industry is out of control. Newspaper reports, citing Government sources indicate that a small group of rogue scientists has tried to take the world’s most important staple food crop into their own hands and have now put the health of people around the world at risk. Seed companies in China that were found to have sold GE rice seed to farmers operate directly under the university researching GE rice and it has been reported that the key scientist even sat on the board of one of the seed companies.¹² The commercialization of GE rice would only benefit the scientists and the companies that they are closely connected with the research and development of the GE rice while putting the world’s main staple food at risk.

After the exposure of the contamination situation in China, the Chinese Government took several steps trying to stop the contamination, which included punishing seed companies and destroying GE rice grown in the field. In early 2006, the government also issued commands and notifications banning the sale of unapproved GE seeds and tightening the control over GE field trials.

But the current situation shows how difficult it is to contain a GE contamination once GE crops have been released into the fields. The Chinese Government will need to take stricter measures to prevent the illegal GE rice contamination from spreading.

European governments should learn from their experience with last year’s contamination incidents involving illegal Syngenta (Bt10) maize imported from the US, and must take two immediate steps:

1. Ensure that any further imports of illegal GE rice products are prevented, giving attention not only to rice from China but also to imports from countries like the USA where there is a known high risk of contamination¹³.
2. Find and ensure removal of illegal GE rice products already on the market.

The series of contamination scandals since the first commercial release of GE crops¹⁴ indicates that we are currently unable to manage or control GE crops. It is time to stop

¹² the Southern Weekend, April 14 2005, <http://www.nanfangdaily.com.cn/southnews/zmzg/200504141093.asp>

¹³ Many contamination incidents occur in the US for detail see: <http://www.gmcontaminationregister.org/>

¹⁴ See Mayer, S., A review of cases of contamination, illegal planting and negative side effects of genetically modified organisms, GM contamination register report 2005, GeneWatch UK and Greenpeace International at: <http://www.gmcontaminationregister.org/> or <http://www.greenpeace.org/bsp2006> or also on <https://bch.biodiv.org/database/record.shtml?id=11886> or

trusting the biotech industry, which continues to place commercial interests before the safety of our health and the environment.

The push to release GE rice in China is coming from a small number of GE scientists who stand to gain financially from the introduction of GE rice. The government is currently taking a cautious attitude towards GE rice due to the risks involved in genetically engineering the country's most important staple food crop.

This illegal GE rice case again shows how irresponsible the GE industry is and why we should not trust the scientists who have a strong financial link with the GE industry with our food.

Rice facts in the world

- At least 114 countries grow rice, but Asian farmers produce 90% of the total global supply.
- Rice is eaten by nearly half the world's population. It is the staple food for the largest number of people on Earth. Among low- and middle-income countries, rice is by far the most important crop worldwide.
- Rice is a main ingredient in many different kinds of food, e.g. rice noodles, rice snacks, baby foods, rice milk and breakfast cereals to name but a few.
- Consumption of rice ranges from an average of 10kg per person per year in the west to approximately 80kg a year in Asia, although consumption levels of 200kg per person a year have been recorded.

China

- China is one of the centres of origin of rice. It is also a centre of diversity of rice with more than 60,000 varieties of rice.
- China is the biggest rice producer and consumer in the world.
- China is one of the top exporters of rice. For 2005, China exported a total of 670,000 tons of rice. However, China's rice exports are less than 1% of its total production.

Europe

- In general, there is steady increase in demand for rice and rice products in Europe, because of the growing popularity of Asian food.

GE rice field trials and application for commercialisation

Field trials with GE rice have taken place in many countries around the world including Brazil, USA, Spain, Japan, Philippines, Vietnam, India and Indonesia. In the USA alone over 190 field trials covering an area of approximately 5000 acres (approximately 2000 hectares) are taken or have taken place¹⁵. For many of these GE rice varieties the foreign gene inserts are not even known. They are kept secret under the disguise of confidential business information. Contamination of rice with unapproved GE rice may occur in many other countries as well, especially in the USA, which is known to have the highest number of contamination incidents in the world¹⁶.

¹⁵ http://www.centerforfoodsafety.org/pubs/Contaminating_the_Wild_Report.pdf

¹⁶ <https://bch.biodiv.org/database/record.shtml?id=11886> or see directly <http://gmcontaminationregister.org/>

The only rice approved for commercial cultivation is Bayer's GE Liberty Link (LL) tolerant GE rice, approved but not yet cultivated in the US. Bayer has applied for cultivation approval in Brazil, has food and feed approval in Canada and has filed applications for food approvals in Europe, Brazil, Japan (already allowed to be imported, but not yet allowed to be used in feed and food) and South Africa. These varieties for which Bayer is seeking approval are not the same as the LL 601 variety, which has recently been found to have contaminated the US rice supply.

Widespread Contamination of Illegal GE Rice in China

