

The UK Independent  
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## **Revealed: health fears over secret study into GM food**

### **Rats fed GM corn due for sale in Britain developed abnormalities in blood and kidneys**

By Geoffrey Lean, Environment Editor

[http://news.independent.co.uk/world/science\\_technology/story.jspstory=640430](http://news.independent.co.uk/world/science_technology/story.jspstory=640430)

Rats fed on a diet rich in genetically modified corn developed abnormalities to internal organs and changes to their blood, raising fears that human health could be affected by eating GM food.

The Independent on Sunday can today reveal details of secret research carried out by Monsanto, the GM food giant, which shows that rats fed the modified corn had smaller kidneys and variations in the composition of their blood.

According to the confidential 1,139-page report, these health problems were absent from another batch of rodents fed non-GM food as part of the research project.

The disclosures come as European countries, including Britain, prepare to vote on whether the GM-modified corn should go on sale to the public. A vote last week by the European Union failed to secure agreement over whether the product should be sold here, after Britain and nine other countries voted in favour.

However, the disclosure of the health effects on the Monsanto rats has intensified the row over whether the corn is safe to eat without further research.

Doctors said the changes in the blood of the rodents could indicate that the rat's immune system had been damaged or that a disorder such as a tumour had grown and the system was mobilising to fight it.

Dr Vyvyan Howard, a senior lecturer on human anatomy and cell biology at Liverpool University, called for the publication of the full study, saying the summary gave "prima facie cause for concern".

Dr Michael Antoniu, an expert in molecular genetics at Guy's Hospital Medical School, described the findings as "very worrying from a medical point of view", adding: "I have been amazed at the number of significant differences they found [in the rat experiment]."

Although Monsanto last night dismissed the abnormalities in rats as meaningless and due to chance, reflecting normal variations between rats, a senior British government source said ministers were so worried by the findings that they had called for further information.

Environmentalists will see the findings as vindication of British research seven years ago, which suggested that rats that ate GM potatoes suffered damage to their health. That research, which was roundly denounced by ministers and the British scientific establishment, was halted and Dr Arpad Pusztai, the scientist behind the controversial findings, was forced into retirement amid a huge row over the claim.

Dr Pusztai reported a "huge list of significant differences" between rats fed GM and conventional corn, saying the results strongly indicate that eating significant amounts of it can damage health. The new study is into a corn, codenamed MON 863, which has been modified by Monsanto to protect itself against corn rootworm, which the company describes as "one of the most pernicious pests affecting maize crops around the world".

Now, however, any decision to allow the corn to be marketed in the UK will cause widespread alarm. The full details of the rat research are included in the main report, which Monsanto refuses to release on the grounds that "it contains confidential business information which could be of commercial use to our competitors".

A Monsanto spokesman said yesterday: "If any such well-known anti-biotech critics had doubts about the credibility of these studies they should have raised them with the regulators. After all, MON 863 isn't new, having been approved to be as safe as conventional maize by nine other global authorities since 2003."

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## **When fed to rats it affected their kidneys and blood counts**

So what might it do to humans? We think you should be told

By Severin Carrell and Andy Rowell

[http://news.independent.co.uk/world/science\\_technology/story.jsp?story=640402](http://news.independent.co.uk/world/science_technology/story.jsp?story=640402)

The secret research we reveal today raises the potential health risks of genetically modified foods. Here, environment editor Geoffrey Lean, who has led this paper's campaign on GM technology for the past six years, examines the new evidence. And he asks the questions that must concern us all: why is Monsanto, the company trying to sell GM corn to Britain and Europe, so reluctant to publish the full results of its alarming tests on lab rats? Why are our leaders so keen to buy the unproven technology against the wishes of consumers? And why is the man who first raised these concerns six years ago shunned by the scientific establishment and his former political masters?

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ONE BLUSTERY DAY six years ago - at the start of The Independent on Sunday's successful GM campaign - I travelled to Aberdeen to meet a man who had been sent to Coventry.

Dr Arpad Pusztai was then the bogeyman of the British scientific establishment. No less a figure than Lord May - then the Government's chief scientific adviser, now president of the Royal Society - had accused him of violating "every canon of scientific rectitude", and ministers and top scientists had queued up to denounce him.

His crime had been to find disturbing evidence that the GM potatoes he was studying damaged the immune systems, brains, livers and kidneys of rats - and to mention it briefly in a television programme before his research was completed and published.

His punishment was draconian; his research was stopped, his team disbanded and his data confiscated (see box). He was ostracised by his colleagues, forced into retirement and gagged for seven months, forbidden to put his case. I was the first journalist to interview him at length, spending six hours with him.

I arrived, very sceptical, at his semi-detached house in the granite city, where he had worked for the prestigious Rowett Research Institute for 37 years, with two handwritten pages of hostile questions. But I was surprised by what I found.

For a start, he proved to be no wild-eyed maverick, but the world's acknowledged top authority in his field, a small, vital, precise man with 270 papers to his name and a self-deprecating sense of humour. Far from a headline-seeker, he was evidently a bewildered stranger to public controversy, cautious in his language, anxious to cross every scientific "t" before venturing a conclusion.

Perhaps most surprising of all he turned out to be, in his words, "a very enthusiastic supporter" of genetic modification who had fully expected his experiments - approved and funded by the Government - to give it a "clean bill of health".

"I was totally taken aback," he told me. "I was absolutely confident that I wouldn't find anything. But the longer I spent on the experiments, the more uneasy I became."

One by one he answered my questions. I can't say I was totally convinced, but I was persuaded of his integrity, and that he deserved a hearing. Grey-faced with the strain - and just recovering from a minor heart attack that he put down to it - he spoke of the "intolerable burden" of being attacked by the scientific community, without being able to defend himself, of being "vilified and totally destroyed".

As we walked to a nearby shop to photocopy some of his papers, he told me that he believed his troubles had started with a phone call to his employers, the Rowett Research Institute, from Downing Street. That really did seem incredible at the time - though rather less so now after the David Kelly affair and the revelations of the Hutton and Butler inquiries.

Some supporting evidence for his suspicion since seems to have emerged (see box). But whatever the truth about that, this was a time when the Government was determined to press full-speed ahead with GM technology - and to rubbish him.

Tony Blair had just put his full weight behind modified foods, letting it be known that he would happily eat them himself. Jack Cunningham, then in charge of the Government's GM strategy, announced that Dr Pusztai had been "comprehensively discredited". His office drew up secret plans - revealed in *The Independent* on Sunday - to enlist "eminent scientists" to attack him and "trail the Government's key messages".

Worse, the Government refused to undertake the normal scientific process of repeating Dr Pusztai's experiments in order to either confirm or disprove his findings. Top officials at the then Ministry of Agriculture, Fisheries and Food told me that it would be "wrong", "immoral" and "a waste of money" to do so - an extraordinary attitude given the potential threat to public health, should he be right.

In the end all these official efforts were in vain. The public settled the argument simply by refusing to eat GM food. Before the Pusztai controversy, 60 per cent of processed foods on supermarket shelves contained GM material. After it the big chains fell over themselves to remove them in the face of the consumer revolt. Eighty-four per cent of Britons still say they will not eat them and even the most pro-GM ministers admit there is no market for them.

Attention then moved away from the health effects of GM food to the infinitely stronger evidence emerging on the environmental impact of GM crops. Study after study - reported in our pages - showed that genes escaped from them to breed superweeds and to contaminate organic and conventional produce. Finally, the Government's own trials - widely expected to support GM crops - found that growing most of them damaged wildlife.

The biotech companies - in stark contrast to their confidence before the start of our campaign - abandoned their plans to grow GM crops in Britain. Six years ago they were awaiting imminent government approval to grow 53 different varieties of them. Not one of these applications now remains, and no new one is expected to be made in the near future. The Independent on Sunday's campaign has been widely praised for its key role in this volte-face.

Now, the focus is swinging back to GM foods - and their safety. The European Commission is pressing for more and more of them to be allowed to be sold in Britain and the rest of the EU. European governments are almost evenly divided for and against them and, in the resulting deadlock, the commission is using a loophole in the democratic process to nod them through one by one.

The latest modified crop to come up for approval for use in food is MON 863, a modified corn already grown and eaten in the US and Canada. On Thursday officials from EU governments were deadlocked again, making it likely that the commission will again wave it through later in the year.

It is particularly controversial because, as we report on page one today, secret research carried out on rats by Monsanto - which owns the corn - suggests that eating it may damage their health.

It indicates that rats fed relatively high levels of MON 863 had smaller kidneys and suffered potentially more harmful blood chemistry than those on a conventional diet. Monsanto dismisses the results as meaningless and due to chance, reflecting normal variations between rats.

Environmentalists, however, will claim that it partially vindicates Dr Pusztai's research, and Dr Beatrix Tappeser, a top German GM official, says that it gives "some reason for concern".

Apart from any possible implications for public health, the research data - as in Dr Pusztai's experiments - are important because they could, if found to be valid, challenge the whole system by which GM foods are approved.

Regulatory bodies assume that if GM crops are similar to their conventional counterparts in a restricted number of ways - such as the amounts of fibre and fatty acids, protein and carbohydrates, vitamins and minerals they contain - then the chemical and genetic differences that do exist between them will not make them more toxic. They pronounce them "substantially equivalent" to non-GM ones and wave them through.

The official European Food Safety Authority, the Food Standards Agency in Britain and other regulatory agencies back Monsanto's view - as does most weighty scientific opinion. It would be extremely foolhardy to disregard their judgements and jump to alarming conclusions.

But it would be equally foolish to dismiss the few dissident voices. For I have found, time after time, in covering controversial environmental issues over the past 35 years, that lone scientists, stubbornly raising concerns in the teeth of entrenched opposition from industry and the scientific establishment, have often proved to be right.

Professor Derek Bryce-Smith of Reading University was ridiculed and marginalised for decades after warning of the dangers of lead in petrol in the 1950s - but it is now being phased out all over the world. The now much honoured Alice Stewart came under similar attack for first warning of the hazards of radiation to the unborn child. And I well remember one of Britain's top officials solemnly informing me a quarter of a century ago that Dr Irving Selikoff, who did more than anyone to sound the alarm on asbestos - now one of the main causes of premature death in Britain - was "evil".

I have sat in the august halls of the Royal Society and been told that acid rain caused by pollution did not exist. I have been lectured by one of Britain's top meteorologists - now travelling the world to warn about global warming - that the climate never changes, and that human activities could not possibly cause it to do so. And who can forget the constant reassurances from the political and scientific establishments that BSE could not spread to people?

A few weeks ago my teenage daughter asked me to test her on her environmental chemistry exam revision. As I checked her answers against the text book, I surprised her by letting out the occasional chuckle at its dry contents. For there, presented as indisputable fact, were many of these once highly controversial concerns raised by dissident scientists and roundly dismissed by the weight of scientific opinion.

It is still a long shot, and the balance of probability is still against it, but it is not impossible that in 25 years today's apparently alarmist concerns about the dangers of GM food will have found their way into a new generation of text books. If so, Dr Pusztai will finally come in from the cold.

### **The lone doctor who first exposed the risks to humans**

It was a startling and sensational claim - a claim aired on prime-time national television. Rats fed on genetically modified potatoes had suffered serious damage to their immune systems and shown stunted growth.

This result, said Dr Arpad Pusztai, the scientist involved, was immensely worrying, since it raised substantial questions about the safety of GM food. "I find it is very unfair to use our fellow citizens as guinea pigs," he remarked.

Dr Pusztai's claims - broadcast by World in Action, one of the nation's most respected current affairs programmes - provoked one of the most intense scientific rows of the decade.

The backlash was orchestrated by ministers, led by Jack Cunningham, then New Labour's "Cabinet enforcer", and by the British scientific establishment.

Dr Pusztai, pictured, was a world authority on the subject, and his remarks, in August 1998, had come at a crucial time for Tony Blair. It ignited a public debate on the safety of GM foods, at a time when the Prime Minister was committing the UK to take a leading role in the bio-tech revolution.

That brief interview left Dr Pusztai's career in ruins.

That Monday evening, Professor Philip James, the head of Dr Pusztai's research centre, the Rowett Research Institute, had congratulated the Hungarian scientist on his television appearance.

Over the next 48 hours, Dr Pusztai and some of his colleagues allege that Professor James took two angry calls from Downing Street - a claim the professor denies. Yet by Wednesday, the Rowett had retracted Dr Pusztai's findings.

Its senior officials alleged the Hungarian had admitted he had misrepresented his findings. Rather than being fed GM potatoes, they claimed, the rats were given ordinary potatoes spiked with a protein which the extra genes might have made.

They also stated these were preliminary findings which had not gone through normal peer-review. In short, said Professor James, Dr Pusztai should not have gone public.

Dr Pusztai still refutes these charges. His study was funded by the Scottish Office's agriculture department. His research was designed to test the environmental safety of using GM potatoes with a toxin, lectin, added.

In 2001, he told a Royal Commission on GMOs in New Zealand it was the GM potatoes that produced the startling finding. The Rowett's tests showed that the GM potatoes were "significantly different" from normal potatoes. Yet, in May 1999, a panel of Royal Society-appointed toxicologists branded his research flawed.

And that was enough for Dr Cunningham to re-enter the debate. Dr Pusztai's findings were "not valid", he said.

But Dr Pusztai may yet emerge as a prophet. The revelations about Monsanto's secret GM corn research may confirm that this pro-GM scientist has become a hero of the anti-GM movement.