



# “Who is behind the curtain? Communicating science in an illusory world”

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<http://animalscience.ucdavis.edu/animalbiotech>

FEWER MOLES

MORE MOLES



SCIENTISTS  
ARE BAD;  
ACTIVISTS  
ARE GOOD



EATING  
MEAT  
CAUSES  
GLOBAL  
WARMING



MEAT IS BAD  
FOR YOU –  
MEATLESS  
MONDAY



PINK  
SLIME



ANTIBIOTIC  
USE IN  
ANIMAL AG



FARMERS  
MISTREAT  
ANIMALS



CONVENTIONAL  
AGRICULTURE  
DESTROYS THE  
ENVIRONMENT



LABEL  
GMOs  
OMG



ORGANIC  
IS BEST





# Dorothy, we are not in Kansas anymore



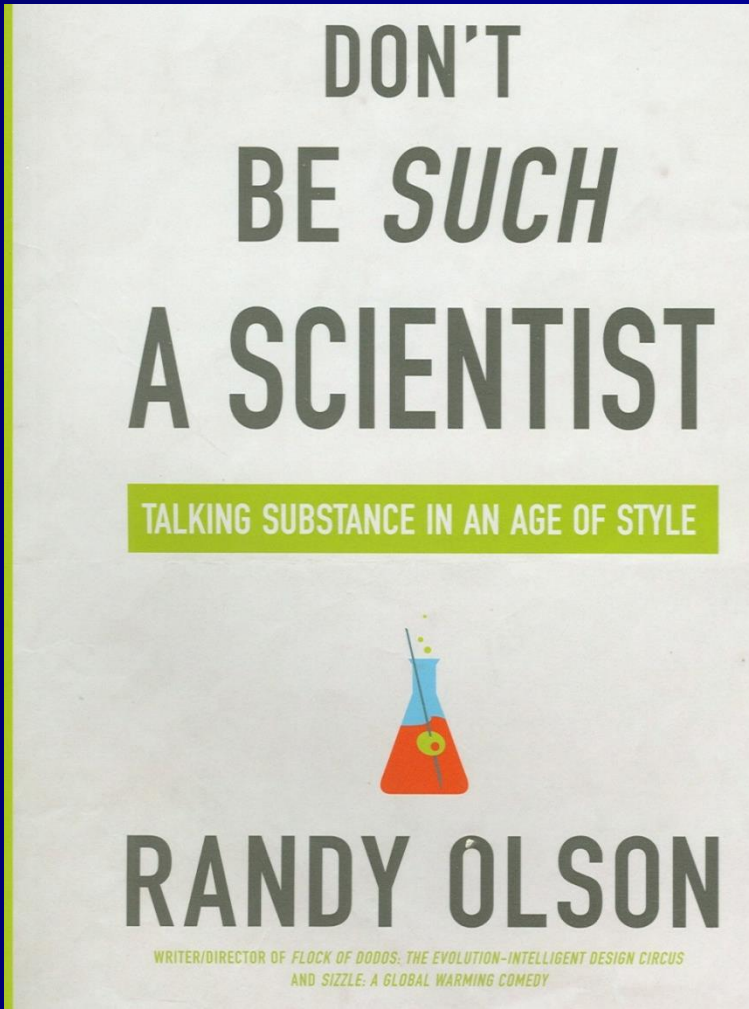
- Special interest groups have become disciplined, strategic and have little interest in scientific accuracy
- Need to communicate in language the public can relate to (and understand!)
- Social media has changed everything – need to respond in real time







# Need to communicate in language the public cares about





# How Academic audiences respond to various aspects of communication



| Communication aspect     | Academic            |
|--------------------------|---------------------|
| Main information channel | Audio and visual    |
| Structure                | Information is fine |
| Mode of response         | Cerebral            |
| Need humor?              | Not necessarily     |
| Like sincerity?          | Suspicious of it    |
| Sex appeal?              | Potential disaster  |
| Prearoused?              | Yes                 |
| Effective elements       | Information         |
| Effective organs         | Head                |
| Preferred voice          | Robotic             |



# How Academic versus General audiences respond to various aspects of communication



| Communication aspect     | Academic            | General               |
|--------------------------|---------------------|-----------------------|
| Main information channel | Audio and visual    | Visual                |
| Structure                | Information is fine | Need a story          |
| Mode of response         | Cerebral            | Visceral              |
| Need humor?              | Not necessarily     | Pretty much           |
| Like sincerity?          | Suspicious of it    | Always                |
| Sex appeal?              | Potential disaster  | The ultimate          |
| Prearoused?              | Yes                 | No                    |
| Effective elements       | Information         | Humor, sincerity, sex |
| Effective organs         | Head                | Heart, gut, gonads    |
| Preferred voice          | Robotic             | Human                 |



The Dr. Oz show  
An eye opening  
adventure



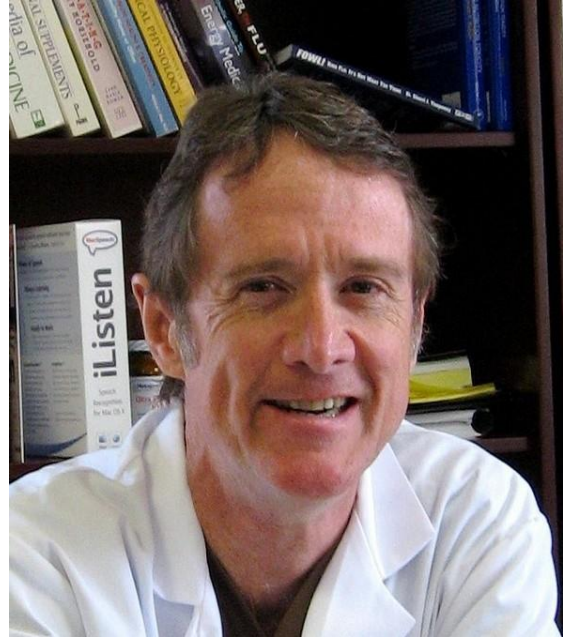
# Let me introduce you to the rest of the cast of characters.....



**Jeffrey Smith**

Executive director,  
Institute for Responsible  
Technology, Fairfield, IA

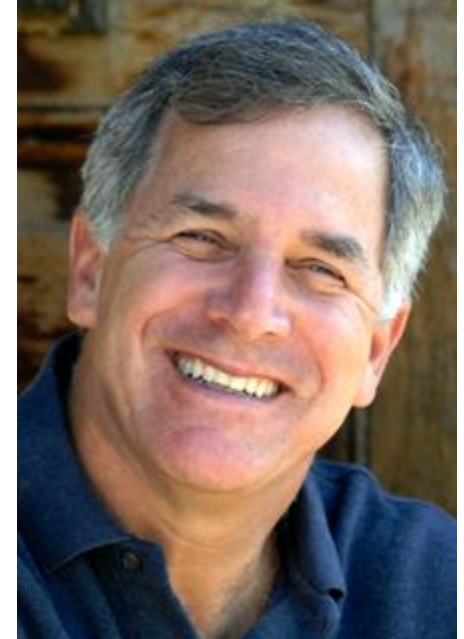
Written two self-published books, *Seeds of Deception: Exposing Industry and Government Lies About the Safety of the Genetically Engineered Foods You're Eating*, and *Genetic Roulette: The Documented Health Risks of Genetically Engineered Foods*, which documents 65 health risks of the GM foods Americans eat every day.



**Dr. Robin Burkhoff, MD**

Burnhoft Center for Advanced  
Medicine, CA

"Dr Bernhoft retrained in environmental medicine, 2002-6. By applying what he learned, he regained his health, and shed his sensitivity to perfumes and mold. Dr Bernhoft is now able to run 20 to 30 miles per week, and is three belts short of black belt in Shito Ryu karate. He has his life back, and is eager to use what he has learned to help others regain theirs.

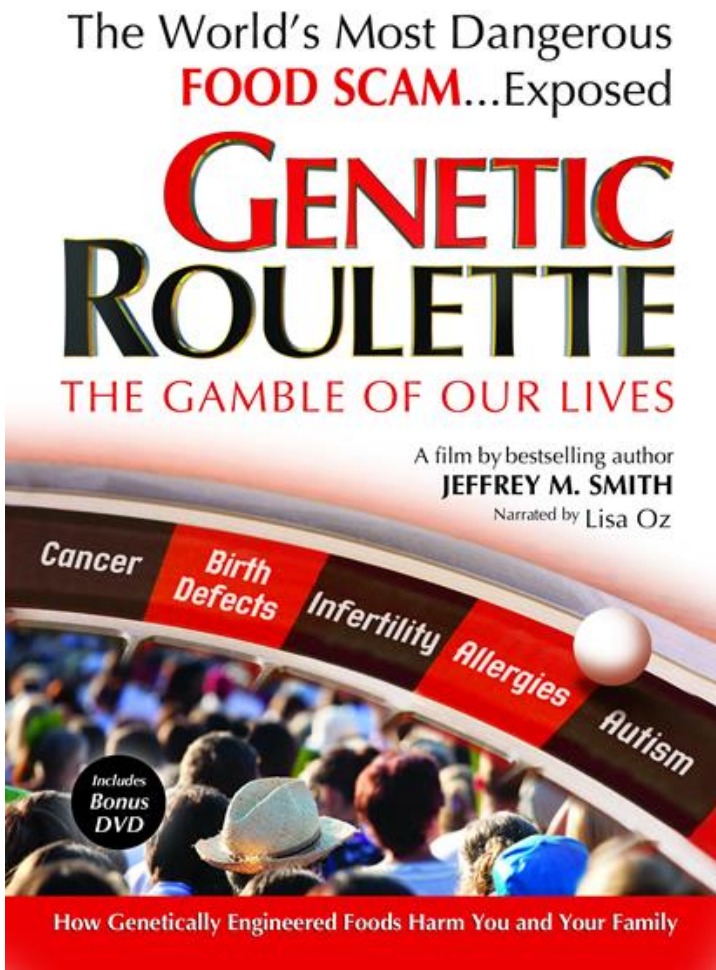


**Gary Hirschburg**

CEO, Stonyfield Organic  
Yogurt, Londonderry, NH

At a high school graduation he had the following advice "Be determined and take risks", he added, "and challenge the conventional wisdom. "Ask why not ..."  
**"Authorities and experts are always overrated", he said.**





Jeffrey Smith isn't bound by the usual conventions. He once advocated getting thousands of people to collectively practice transcendental meditation – the yogic flying technique, to be precise, shown below ([en.wikipedia.org/wiki/TM-Sidhi\\_program](http://en.wikipedia.org/wiki/TM-Sidhi_program)) – to reduce crime and increase “purity and harmony” in the “collective consciousness.”



Jeffrey Smith demonstrating “yogic flying” during a Natural Law Party press conference in Springfield, Ill., on Oct. 22, 1996, where he was a member of a party delegation from Iowa. Associated Press photo.

Smith is now better known for his theories about biotech agriculture, or GM foods. His self-published books *Seeds of Deception* and *Genetic Roulette* have built for him an online profile that has made Smith one of the most widely quoted opponents of biotech ag —despite his evident lack of scientific credentials or other formal training on the subject. (He **has** had formal training in swing dancing, however, which he used to teach professionally.)

<http://academicsreview.org/reviewed-individuals/jeffrey-smith>



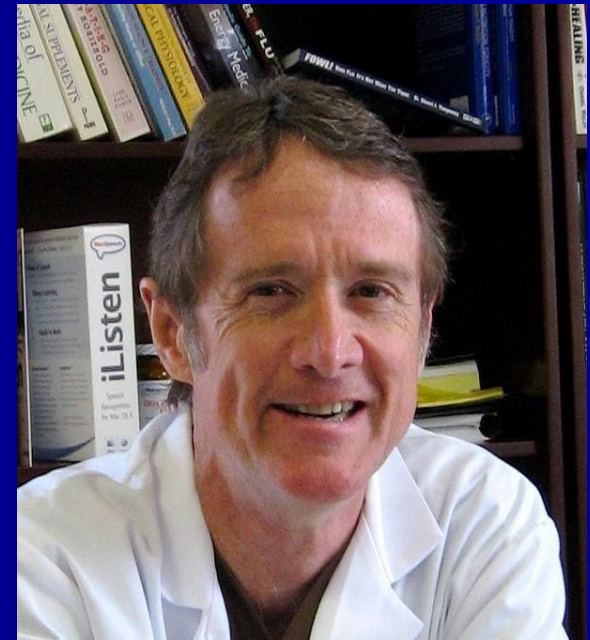
# There is a scientific consensus: Professional Scientific and/or Medical bodies with an opinion on safety of GE

## Generally Positive

- ✓ The U.S. National Research Council (NRC)
- ✓ U.S. National Academy of Sciences (NAS)
- ✓ The American Medical Association, (AMA)
- ✓ U.S. Department of Agriculture (USDA)
- ✓ U.S. Environmental Protection Agency (EPA)
- ✓ U.S. Food and Drug Administration (FDA)
- ✓ European Food Safety authority (EFSA)
- ✓ American Society for Plant Biology (ASPB)
- ✓ Federation of Animal Science Societies (FASS)
- ✓ World Health Organization (WHO)
- ✓ Food and Agriculture Organization (FAO)
- ✓ Royal Society (London)
- ✓ Brazil National Academy of Science,
- ✓ Chinese National Academy of Science
- ✓ Indian National Academy of Science
- ✓ Mexican Academy of Science
- ✓ Third World Academy of Sciences

## Generally Negative

- x The American Academy of Environmental Medicine (AAEM)



**Dr. Robin Burkhoff, MD**





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## Generally Negative

x The American Academy of Environmental Medicine (AAEM)

The AAEM also opposes

- water fluoridation
- the use of mercury-containing compounds in any product for human consumption, including mercury in vaccines
- radiofrequency (RF) exposure from wireless devices “because multiple studies correlate RF exposure with diseases such as cancer, neurological disease, reproductive disorders, immune dysfunction, and electromagnetic hypersensitivity.”

Quackwatch.org lists AAEM as a questionable organization, and its certifying board, the American Board of Environmental Medicine as a dubious certifying board. The AAEM is not recognized by the American Board of Medical Specialties.





# ADVOCACY OF SCIENCE

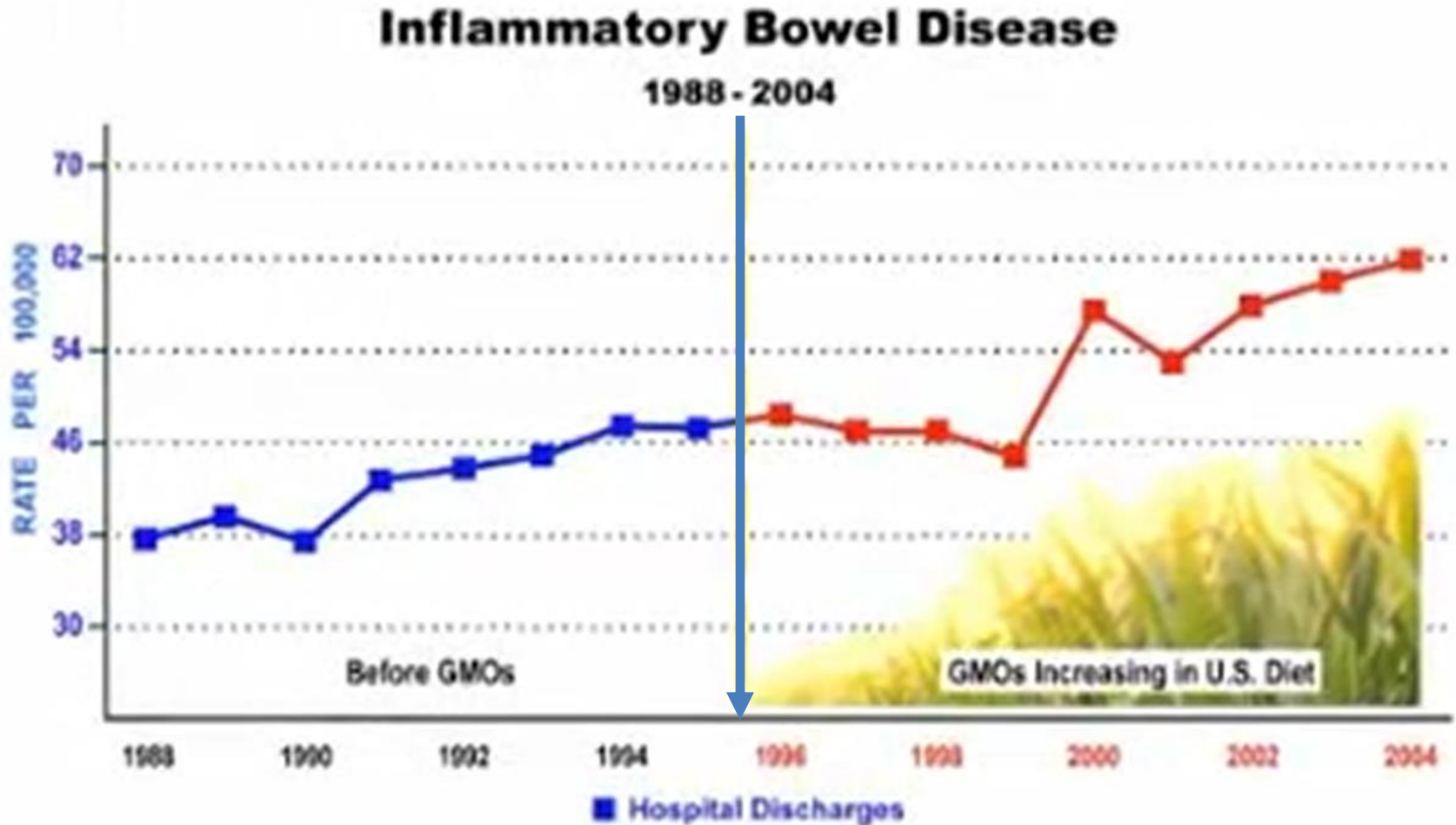
## 1. Calling on poor science or political science in a way that gets publicity

Replace "spurious" or "poor experimental design" with .....

**bogus, big talk, bunkum, cock-and-bull story, disingenuous, exaggeration, fairy tale, fancy talk, far-fetched story, fib, fiction, fine talk, fish story, flam, flimflam, half-truth, highfalutin, highfaluting, hot air, lie, mendacity, pious fiction, prevarication, snide, sinister, trumped-up story**

## BE PASSIONATE

# My first response is to go look at the literature



Introduction of  
biotech crops

## Recent trends in the epidemiology of inflammatory bowel diseases: up or down?

Lakatos PL.

1st Department of Medicine, Semmelweis University, Koranyi str. 2/A, H-1083, Hungary. kislakpet@bel1.sote.hu

### Abstract

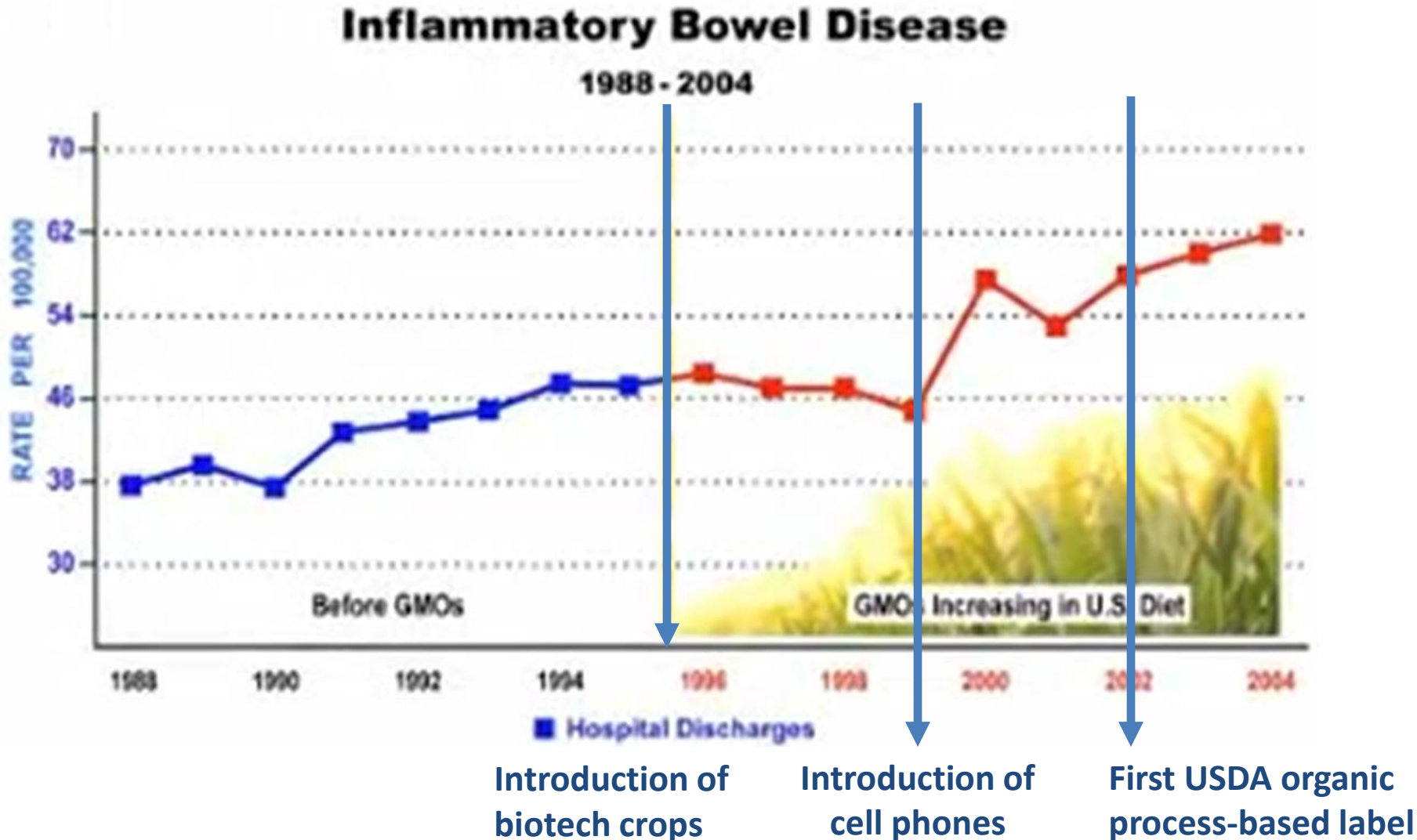
Inflammatory bowel disease (IBD) is traditionally considered to be common in the Western world, and its incidence has sharply increased since the early 1950s. In contrast, until the last decade, low prevalence and incidence rates have been reported from other parts of the world including Eastern Europe, South America, Asia and the Pacific region. Recent trends indicate a change in the epidemiology of IBD with previously low incidence areas now reporting a progressive rise in the incidence, while in West European and North American countries the figures have stabilized or slightly increased, with decreasing incidence rates for ulcerative colitis. Some of these changes may represent differences in diagnostic practices and increasing awareness of the disease. The quality of studies is also variable. Additional epidemiologic studies are needed to better define the burden of illness, explore the mechanism of association with environmental factors, and identify new risk factors.

PMID: 17036379 [PubMed - indexed for MEDLINE] **Free full text**

“Inflammatory bowel disease (IBD) is a multifactorial disease with probable genetic heterogeneity. The geographical incidence of IBD varies considerably. The incidence **rates began to increase in the late 1930s** in the United States. The highest incidence rates are traditionally reported in **Northern and Western Europe** as well as North America, whereas lower rates are recorded in Africa, South America and Asia, including China. It is more common in developed, more industrialized countries, pointing at urbanization as a potential risk factor. In the late 1990s, the incidence of ulcerative colitis leveled off to a plateau **or even decreased**, while the incidence of Crohn’s disease was still increasing in most European countries. Recent data, however, suggest a further increase in the incidence of IBD, at least in some **North European countries**. Both ulcerative colitis and Crohn’s disease appear to be more frequent in the northern parts of the US than in the south.”



**Better to explain “bogus” Post-hoc fallacy:  
If B happens after A, then A must have resulted in B**





# ADVOCACY OF SCIENCE

1. Calling on poor science or political science in a way that gets publicity
2. Indignation when scientific process becomes corrupted for political purposes





**Sensational poorly-designed studies on small numbers of animals get huge media attention with no mention of the literally hundreds of other independent studies finding no effect of GE feed (e.g. Seralini *et. al.* 2012 *Food Chem Toxicol* 50:4221–4231 - **RETRACTED**)**

## What is missing?



Control image downloaded from <http://www.ratfanclub.org/mamtumpics.html>  
Approx. 70% of female Sprague–Dawley rats get mammary tumors by 2 years of age



# Social media has changed everything – need to respond in real time – 2 hours!

**Sent:** Wednesday, September 19, 2012 9:42 AM

**To:** Alison L. Van Eenennaam

**Subject:** FW: Massive Tumors in Rats Fed GMOs - Press Call at 2:30 with Leading Experts

**I'm food and agriculture reporter with .....in Washington, DC. I came across your name looking for a second opinion on the study (and upcoming press conference) referenced in the press release below. Do you have some time this afternoon for a phone call? Please let me know the best time to reach you and the best number to call. If you're not available, is there someone else you'd recommend?**

## Massive Tumors in Rats Fed GMOs in First Long-Term Study

*Leading Experts to Hold Press Call Today at 2:30pm EDT*

Statement from Yes on Proposition 37, California Right to Know GMO Labeling Campaign

Oakland, CA - Genetically engineered corn was linked mammary tumors, kidney and liver damage and other serious illnesses in the first ever peer-reviewed, long-term animal study of these foods. The findings were published today in the journal Food and Chemical Toxicology.

Read the study here: <http://research.sustainablefoodtrust.org/wp-content/uploads/2012/09/Final-Paper.pdf>

Reuters story about the study: <http://www.reuters.com/article/2012/09/19/gmcrops-safety-idUSL5E8KJAGN20120919>

While numerous 90-day studies have already linked GMO foods to allergies and other health problems, today's publication marks the first-ever long term animal study on the health effects of genetically engineered foods, and comes as California voters consider the Proposition 37 Right to Know initiative to label genetically engineered foods.

In response to this study, Yes on Proposition 37 California Right to Know Campaign Manager Gary Ruskin released the following statement:

"The results of this study are worrying. They underscore the importance of giving California families the right to know whether our food is genetically engineered, and to decide for ourselves whether we want to gamble with our health by eating GMO foods that have not been adequately studied and have not been proven safe. By requiring simple labels on genetically engineered foods, Proposition 37 gives Californians the ability to choose whether to expose ourselves and our families to any potential health risks. The right to know is fundamental, and that's why 50 countries around the world have already enacted labeling requirements for genetically engineered food."

The study's authors, together with the non-profit organization Sustainable Food Trust, will be hosting a press conference call today to discuss the study at 11:30 a.m. PDT

### WHAT:

Telephone press conference press briefing on first animal feeding trial studying the lifetime effects of exposure to Roundup tolerant GM maize, and Roundup, the world's best-selling weedkiller.



9255 GMO



9344 GMO+R



9202 R

**What really concerned me were the photos of the rats with abnormally large tumors,” she said. “I realize that they were trying to prove a point, but you don’t make animals suffer to do it. At our lab, once a tumor exceeds 40 millimeters, the animal is sacrificed. We take animal welfare very seriously, and for these researchers to allow the [treated] rats to grow tumors as large as the ones they photographed is absolutely appalling.”**



***“There is little benefit to society if attempts to increase public participation in the regulatory process are used as an opportunity to vilify technology.”***

## Transgenic salmon: a final leap to the grocery shelf?

Nature Biotechnology (2011) **29**: 706–710.

Alison L Van Eenennaam & William M Muir

Despite being caught up in regulatory proceedings for 15 years or more, AquAdvantage salmon, the first animal genetically engineered (GE) for food purposes, continues to raise concerns. Are any of these concerns scientifically justified?

© 2011 Nature America, Inc. All rights reserved.

The tortuous passage of AquAdvantage salmon through the US regulatory system provides a stark reminder of the adage that sometimes it is good not to be first. A fast-growing transgenic fish containing a gene encoding Chinook salmon growth hormone under the control of an antifreeze protein promoter and terminator from ocean pout, AquAdvantage salmon has been subjected to one of the most prolonged, if not exhaustive, regulatory assessments in history. This process culminated last September with a meeting of the Veterinary Medicine Advisory Committee (VMAC) as well as a public hearing, together with the release of a comprehensive health and safety briefing and an environmental assessment package on the transgenic animal developed by AquaBounty Technologies of Waltham, Massachusetts. Despite VMAC's determination



AquaBounty Technologies





**Alaska trip from the pages of National Geographic**

Provided by Lindblad Expeditions



**Shocking discovery for joint relief**

Provided by Instaflex



**What is the best non-prescription eyelash enhancer?**

Provided by DermStore.com  
Advertising by lifestyle

## NEWS ANALYSIS

# Scientists fret over FDA slowness on genetically altered animals

Approval of foods from genetically modified animals is unjustifiably slow, scientists say; some are looking abroad.

Comments 11

Email Share +1 8

Tweet 142



AquaBounty's genetically modified salmon, rear, is shown with an unmodified salmon of the same age. (AquaBounty Technologies / October 1, 2012)

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# ADVOCACY OF SCIENCE

- 
- A photograph of a spiral staircase with colorful glass panels, likely a modern architectural feature.
1. Calling on poor science or political science in a way that gets publicity
  2. Righteous indignation when scientific process becomes corrupted for political purposes
  3. **Call out hypocrisy**



# Mandatory labeling of GE food

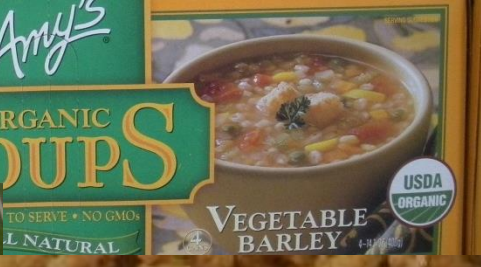
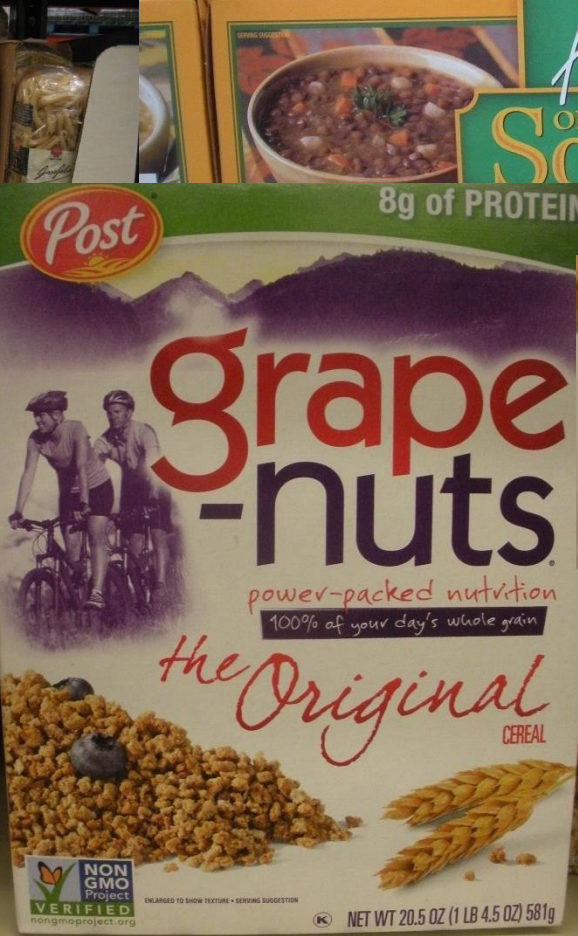
Consumers who want non-GE food have a choice already – voluntary labeling



- Organic milk ~ 3X cost of conventional milk
- Organic poultry and eggs ~ 2X cost of conventional product
- Organic vegetables ~ 2X cost of conventional product
- Organic fruits ~ 1.5X cost of conventional product

<http://www.ers.usda.gov/data-products/organic-prices.aspx#44268>



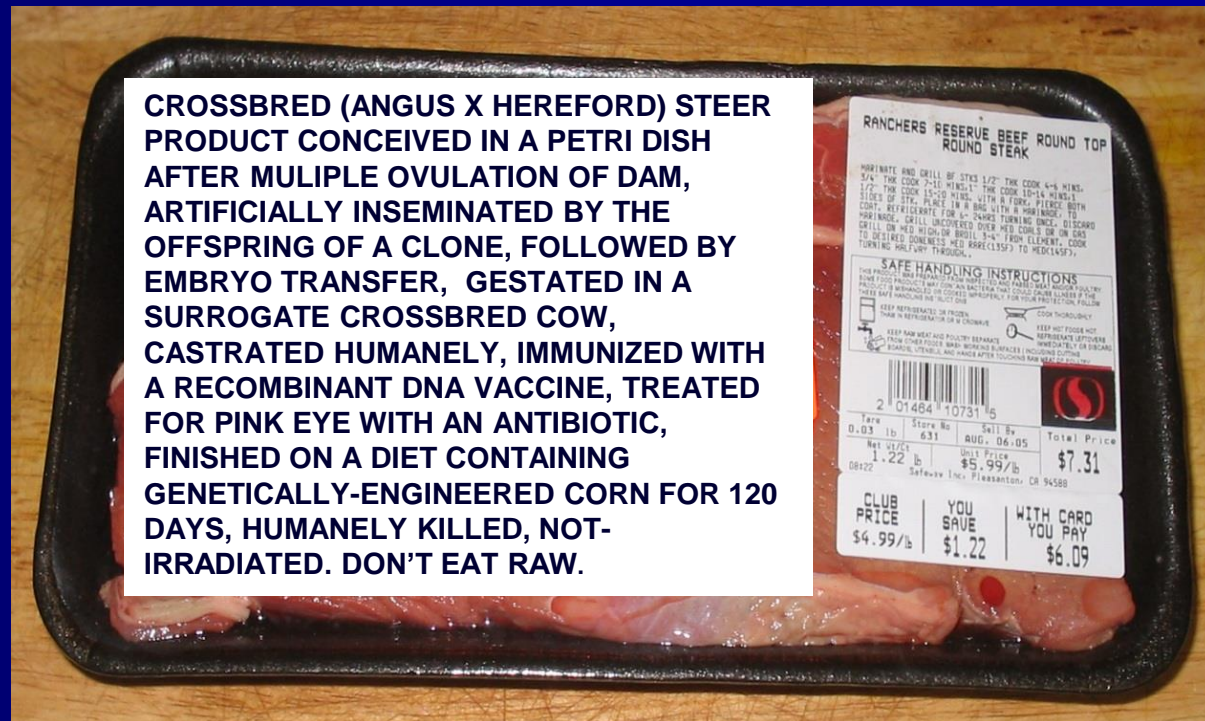






# Mandatory process-based labeling singles out GE process in absence of difference in product – there are many processes used in food production

What would be the implications of mandatory consumer “right to know” process-based labeling about all production processes used in obtaining animal products?





# Mandatory GE labeling in other countries has actually removed GE choice from the marketplace



- ***"Our objective is to eliminate GMOs [from the US food supply] but we also see GMO labeling as a useful tool in the meantime because we know that transitioning to a non-GMO supply chain will take time".***  
Elizabeth O'Connell, campaigns director for GMO Inside/Green America, 2014  
<http://www.foodnavigator-usa.com/Markets/GMO-Inside-calls-on-Starbucks-to-source-organic-milk-from-cows-not-fed-GM-feed>
- **"How – and how quickly – can we move healthy, organic products from a 4.2% market niche, to the dominant force in American food and farming? ...The first step is to change our labeling laws."**  
Ronnie Cummings, Organic Consumers, 2012  
<https://www.commondreams.org/view/2012/08/02-0>
- **"Personally I believe GM foods must be banned entirely, but labeling is the most efficient way to achieve this."**  
Dr. Joseph Mercola – 2012  
<http://articles.mercola.com/sites/articles/archive/2012/02/29/new-vermont-gmo-labeling-policy-officially-introduced.aspx>
- **"We are going to force them to label this food. If we have it labeled we can organize people not to buy it."**  
Andrew Kimbrell – Center for Food Safety, 2013  
<http://www.examiner.com/article/washington-state-s-voters-are-still-confused-as-i-522-vote-approaches>





# Not all scientists are industry shills

**Shill:** an accomplice of a hawker, gambler, or swindler who acts as an enthusiastic customer to entice or encourage others.




Like  
sincerity?  
Always





# ADVOCACY OF SCIENCE

- 
- A photograph of a spiral staircase with colorful glass panels, likely a modern architectural feature.
1. **Calling on poor science or political science in a way that gets publicity**
  2. **Righteous indignation when scientific process becomes corrupted for political purposes**
  3. **Call out hypocrisy**
  4. **Rebranding to match societal concerns**



# Tragically few people care about this

Quote I heard in debate about GE today  
"I am growing weary of the feed the world argument"



<http://www.smh.com.au/news/world/why-you-will-never-see-a-front-page-like-this/2005/06/30/1119724757442.html>