

# Safety and supply of milk, meat and eggs from livestock that have consumed GMO feed

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# What are GMOs? Genetically modified organisms – too general of a term!!





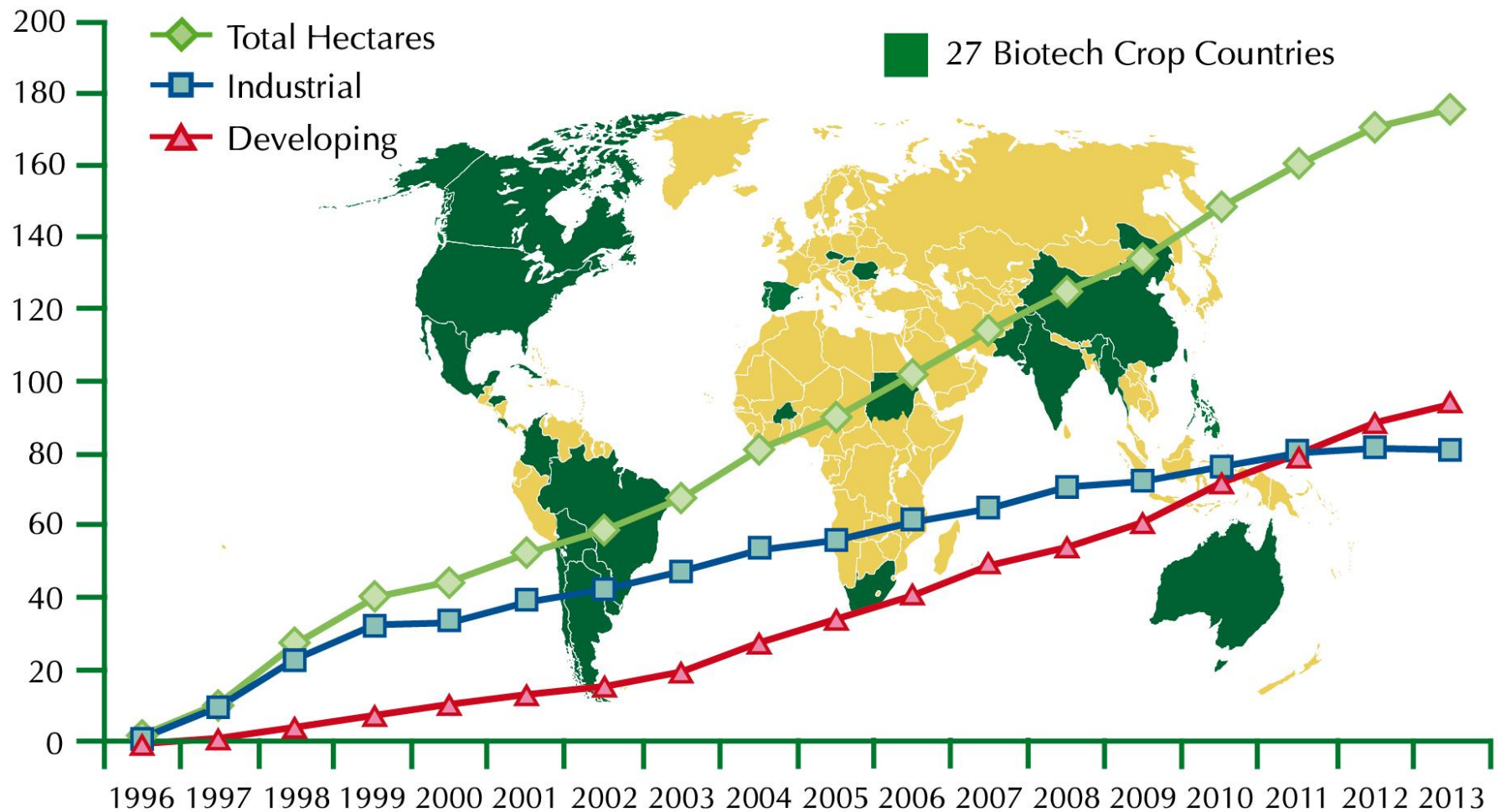
# What is genetic engineering?

- The USDA's current definition of genetic engineering is “manipulation of an organism’s genes by introducing, eliminating or rearranging specific genes using the methods of modern molecular biology, particularly those techniques referred to as recombinant DNA (rDNA) techniques.”
- Also known as genetically modified, GM, GMO, transgenic, bioengineered, biotech, made with modern biotechnology, Frankenfood





# Global Area of Genetically Engineered (GE) crops Million hectares (1996-2013)



*A record 18 million farmers, in 27 countries, planted 175.2 million hectares (433 million acres) in 2013, a sustained increase of 3% or 5 million hectares (12 million acres) over 2012.*





# What crops are GE in US?

- ✓ 90% of all **corn** planted in U.S. was GE in 2013
- ✓ 90% of all **cotton** planted in U.S. was GE in 2013
- ✓ 93% of all **soybeans** planted in U.S. was GE in 2013
- ✓ 95% of all **sugar beet** planted in U.S. was GE in 2013
- ✓ 90% of all **alfalfa** seeds sold in US were GE in 2013
- ✓ Also canola, papaya, some squash, melons and sweetcorn

## NON-GE FEEDSTUFFS CURRENTLY INCLUDE

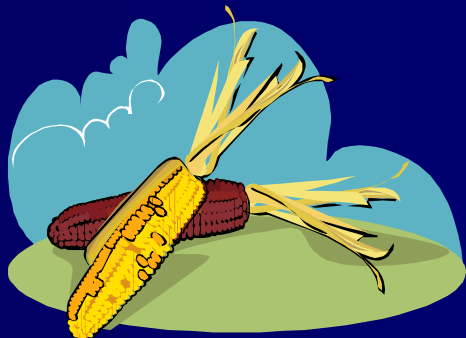
- Wheat
- Sorghum
- Oats
- Rice
- Millett
- Barley



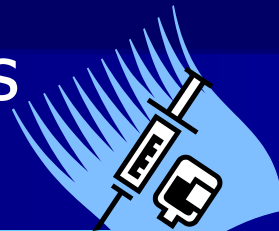
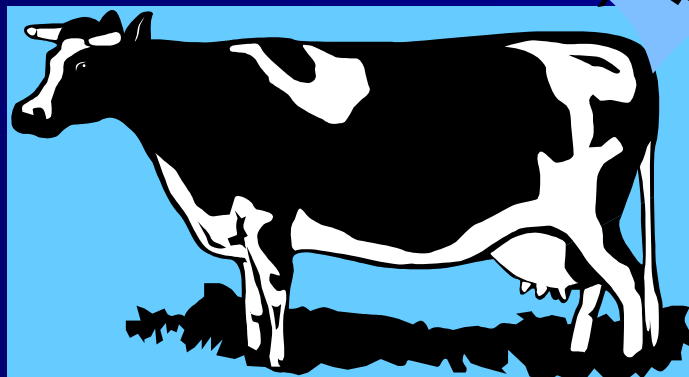
# Where is GE used in Animal Agriculture?

GE products are used in animal feed, vaccines (chickens, pigs, horses, dogs, cats), pharmaceuticals, food processing aids, and food

GMO feed



rDNA vaccines  
rBST



GMO food & ingredients



GE rennet, and  
other food  
processing aids

Currently  
no GM  
animals  
in market





# Top Ten Myths about GE food and feeding GE crops to livestock

1. There is scientific uncertainty/lack of consensus about safety of GE







# There is scientific consensus

## 600+ published safety assessments

An estimated 2 trillion meals containing GE ingredients have been eaten around the world over the last 16 years without a single substantiated case of ill-health.

### **Some summary statements of leading science organizations include:**

- “No effects on human health have been shown as a result of the consumption of such foods by the general population in the countries where they have been approved.”(World Health Organization)
- “No adverse health effects attributed to genetic engineering have been documented in the human population.” (National Academy of Sciences)
- “The science is quite clear: crop improvement by the modern molecular techniques of biotechnology is safe.” (American Association for the Advancement of Science)
- “There is no scientific justification for special labeling of bioengineered foods. Bioengineered foods have been consumed for close to 20 years, and during that time, no overt consequences on human health have been reported and/or substantiated in the peer-reviewed literature.” (American Medical Association)
- “No scientific evidence associating GMOs with higher risks for the environment or for food and feed safety than conventional plants and organisms.” (European Commission)



# 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)

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.



# Top Ten Myths about GE food and feeding GE crops to livestock

1. There is scientific uncertainty/lack of consensus about safety of GE
2. There have been no independent safety studies on GE crops







# There have been hundreds of animal feeding studies using GE crops

Animal species/ category	Number of experiments	Nutritional assessment
Ruminants		No unintended effects in composition (except lower mycotoxin concentration in Bt-plants)
Dairy cattle	23	
Beef cattle	14	
Others	10	
Pigs	21	No significant differences in digestibility and poultry health as well as no biological relevant unintended effects on performances of animals and composition of food of poultry origin
Poultry		
Broilers	48	
Laying hens	12	
Other poultry	1	
Others (fish, rabbits etc.)	8	



# FASS maintains a list of animal feeding studies with GE crops; and transgenic DNA and protein in livestock products




← → FASS http://www.fass.org/page.asp?pageID=43 🔍 ↻ FASS Federation of Animal Scien... x

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 Federation of Animal Science Societies®



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### Scientific References

FASS is committed to assisting in the dissemination of scientific information to accomplish our goal for the pursuit of scientific and educational good of animal agriculture. To support this effort, we have assembled the following list of references. We hope that you find value in this list of scientific articles, organized by topic and species when planning your research.

[References - Feeding Transgenic Crops to Livestock](#)  
 PDF Available  
Updated May 2012

[References Pertaining to Transgenic DNA and Protein and Livestock Products \(Meat, Milk, Eggs\)](#)  
 PDF Available  
Updated April 2012



# Top Ten Myths about GE food and feeding GE crops to livestock

1. There is scientific uncertainty/lack of consensus about safety of GE
2. There have been no independent safety studies on GE crops
3. There have been no long term studies on the effects of GE crops







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# Food and Chemical Toxicology

journal homepage: [www.elsevier.com/locate/foodchemtox](http://www.elsevier.com/locate/foodchemtox)



## Review

### Assessment of the health impact of GM plant diets in long-term and multigenerational animal feeding trials: A literature review

Chelsea Snell<sup>a</sup>, Aude Bernheim<sup>b</sup>, Jean-Baptiste Bergé<sup>c</sup>, Marcel Kuntz<sup>d</sup>, Gérard Pascal<sup>e</sup>, Alain Paris<sup>f</sup>, Agnès E. Ricroch<sup>b,\*</sup>

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<sup>d</sup> Laboratoire Physiologie Cellulaire Végétale, CNRS – Université Joseph Fourier – INRA, Institut de Recherches en Technologies et Sciences pour le Vivant, 38054 Grenoble, Cedex 9, France

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Multigenerational studies

Systematic review

## ABSTRACT

The aim of this systematic review was to collect data concerning the effects of diets containing GM maize, potato, soybean, rice, or triticale on animal health. We examined 12 long-term studies (of more than 90 days, up to 2 years in duration) and 12 multigenerational studies (from 2 to 5 generations). We referenced the 90-day studies on GM feed for which long-term or multigenerational study data were available. Many parameters have been examined using biochemical analyses, histological examination of specific organs, hematology and the detection of transgenic DNA. The statistical findings and methods have been considered from each study. Results from all the 24 studies do not suggest any health hazards and, in general, there were no statistically significant differences within parameters observed. However, some small differences were observed, though these fell within the normal variation range of the considered parameter and thus had no biological or toxicological significance. If required, a 90-day feeding study performed in rodents, according to the OECD Test Guideline, is generally considered sufficient in order to evaluate the health effects of GM feed. The studies reviewed present evidence to show that GM plants are nutritionally equivalent to their non-GM counterparts and can be safely used in food and feed.

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# Meta-analysis of long-term and multigenerational animal feeding trials

- Published long-term feeding studies using a GE-based diet ranged from 110-728 days
- The longest multigenerational study involved 10 generations.
- The authors concluded that none of the long-term or multigenerational studies they evaluated revealed any new effect that had not been found in the 90-d rodent toxicology study

*"The studies reviewed present evidence to show that GM plants are nutritionally equivalent to their non-GM counterparts and can be safely used in food and feed."*

Snell C, Bernheim A, Berge JB, Kuntz M, Pascal G, Paris A, Ricroch AE. 2012. **Assessment of the health impact of GM plant diets in long-term and multigenerational animal feeding trials: a literature review.** *Food Chem Toxicol* **50**:1134–1148.





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# Global livestock populations have been eating predominately GE feed for well over a decade

70-90% of harvested GE biomass is fed to food producing animals



Flachowsky G, Schafft H, Meyer U: 2012 **Animal feeding studies for nutritional and safety assessments of feeds from genetically modified plants: a review.** (*Journal of Consumer Protection and Food Safety*) :179–194.





# The majority of the more than 100 billion food animals raised in the US between 2000-2011 consumed varying levels of GE feed.

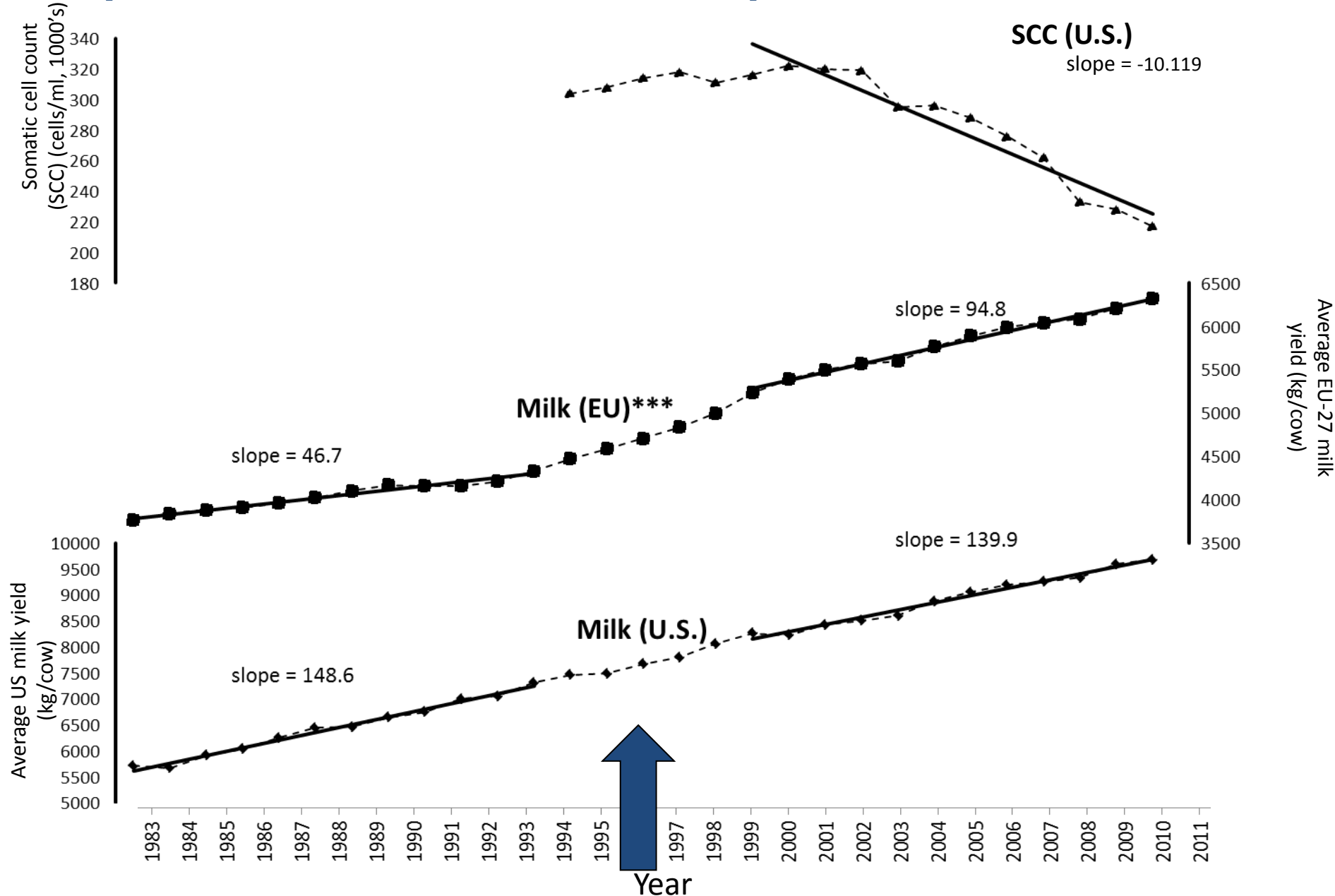


Industry <sup>a</sup>	U.S. <sup>b</sup>
Broiler	105,426,000,000
Beef cattle	410,000,000
Dairy Cows	35,000,000
Hogs	105,000,000
Total	<b>105,976,000,000</b>

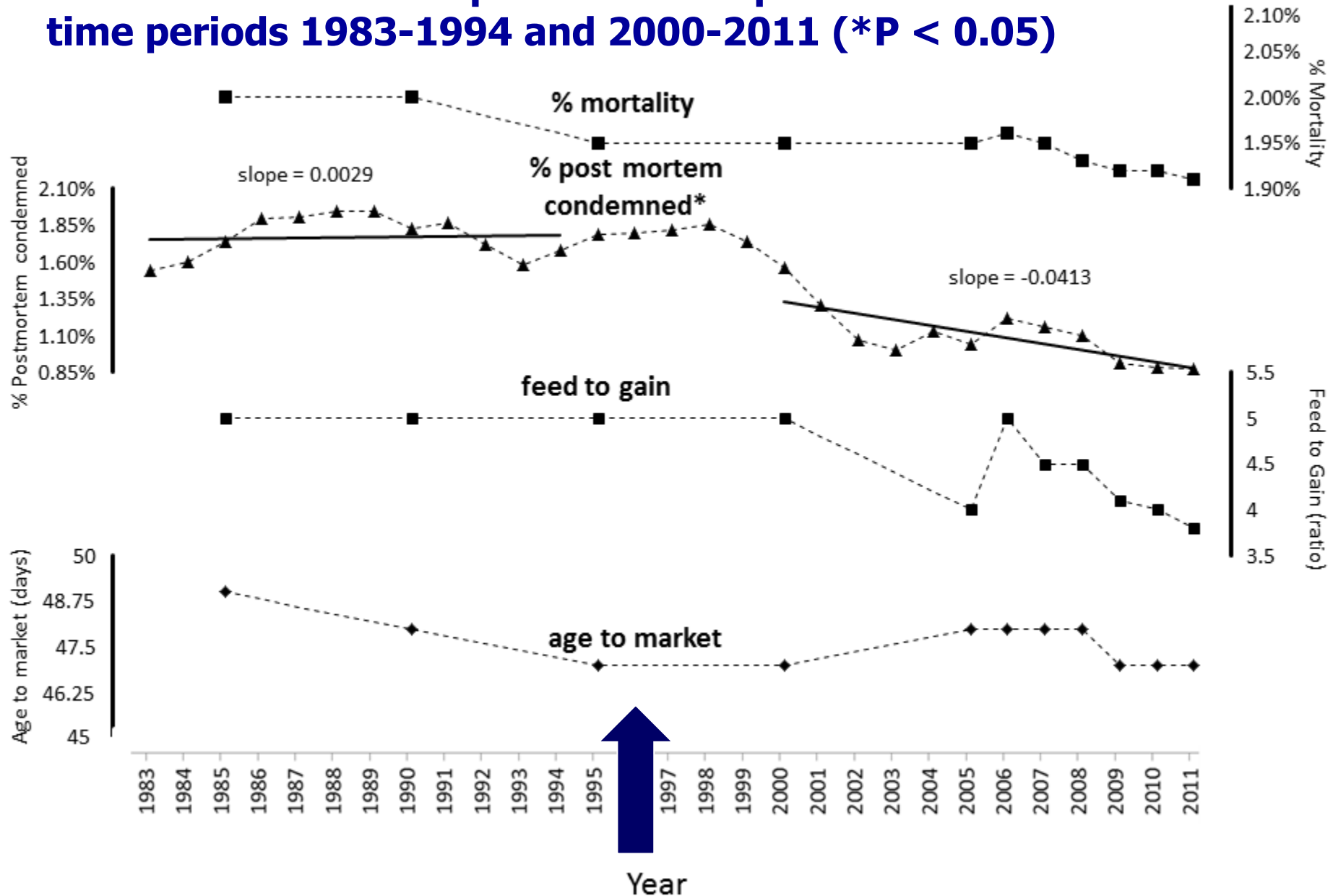
<sup>a</sup> Numbers for broilers, hogs (barrows and gilts) and beef cattle (steers) are for slaughtered animals during calendar year. Dairy animals are number of dairy cows in a calendar year divided by three to account for three lactations per animal.

<sup>b</sup> USDA: The USDA Economics, Statistics and Market Information System (ESMIS). 2013  
<http://usda.mannlib.cornell.edu/MannUsda/homepage.do>.

# Milk production statistics and somatic cell counts in US prior to and subsequent to the introduction of GE crops in 1996



# US broiler statistics prior to and subsequent to the introduction of GE crops in 1996. Slope differs between time periods 1983-1994 and 2000-2011 (\*P < 0.05)







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



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



**This rat study (subsequently retracted by the journal) was given a lot of coverage by popular media, including the Dr. Oz Show**







# Highly-publicized yet poorly-designed animal feeding studies have real world consequences



“Within hours, the news had been blogged and tweeted more than 1.5 million times. Lurid photos of tumor-ridden rats appeared on websites and in newspapers around the world, while larger-than-life images of the rats were broadcast across the USA on the popular television show Dr. Oz.

Activists destroyed a GM soybean consignment at the port of Lorient, France, in order to denounce the presence in the food chain of a product they considered to be toxic. The Russian Federation and Kazakhstan banned imports of the maize variety used in the study, Peru imposed a 10-year moratorium on GM crops and Kenya banned all imports of GM food.”

Arjó G, Portero M, Piñol C, Viñas J, Matias-Guiu X, Capell T, Bartholomaeus A, Parrott W, Christou P. 2013. **Plurality of opinion, scientific discourse and pseudoscience: an in depth analysis of the Séralini et al. study claiming that Roundup™ Ready corn or the herbicide Roundup™ cause cancer in rats.** Transgenic Res. 22:255-67.

# Top Ten Myths about GE food and feeding GE crops to livestock



1. There is scientific uncertainty/lack of consensus about safety of GE
2. There have been no independent safety studies on GE crops
3. There have been no long term studies on the effects of GE crops
4. GE feed is making livestock populations sick (e.g. pigs with enlarged uteruses, infertility, tumors, mortality)
5. Meat, milk and eggs from animals that have eaten GE crops is unsafe/different/dangerous





# Does it affect livestock (milk, meat, eggs) from animals eating GE feed?

- No GE rDNA or the newly expressed proteins encoded have ever been found to be present in the milk, meat, or eggs from animals that have eaten GE feed
- It is not possible to distinguish any differences in the nutritional profile of animal products following consumption of GE feed
- **Labeling of such animal products is not currently mandatory in either US or Europe.**





# Freely available publication from Council for Agricultural Science and Technology (<http://www.cast-science.org>)

## CAST<sup>®</sup> Issue Paper

Number 34  
July 2006

### Safety of Meat, Milk, and Eggs from Animals Fed Crops Derived from Modern Biotechnology

*Animal Agriculture's Future through Biotechnology, Part 5*

#### SUMMARY

As the global land area of biotechnology-derived crops modified for agronomic input traits such as herbicide tolerance and/or insect resistance continues to increase, these crops have become an increasingly important source of feed-stuffs for farm animals, and it is important to review the safety of meat, milk, and eggs derived from animals fed these crops. Once the safety of the newly expressed protein has been established, then nutritional equivalence between




**Safety of Meat, Milk, and Eggs from Animals Fed Crops Derived from Modern Biotechnology**

<http://www.cast-science.org/download.cfm?PublicationID=2910&File=1e30ecea828a9b1ea77c6773b63647251564TR>



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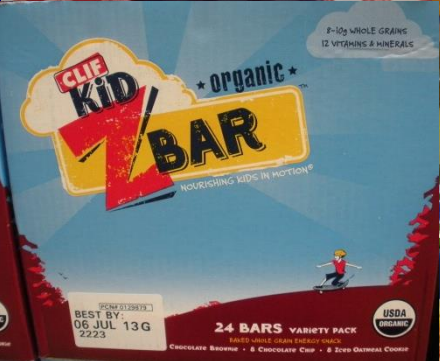
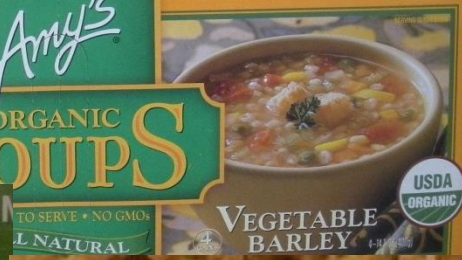


# Mandatory labeling of GE food

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





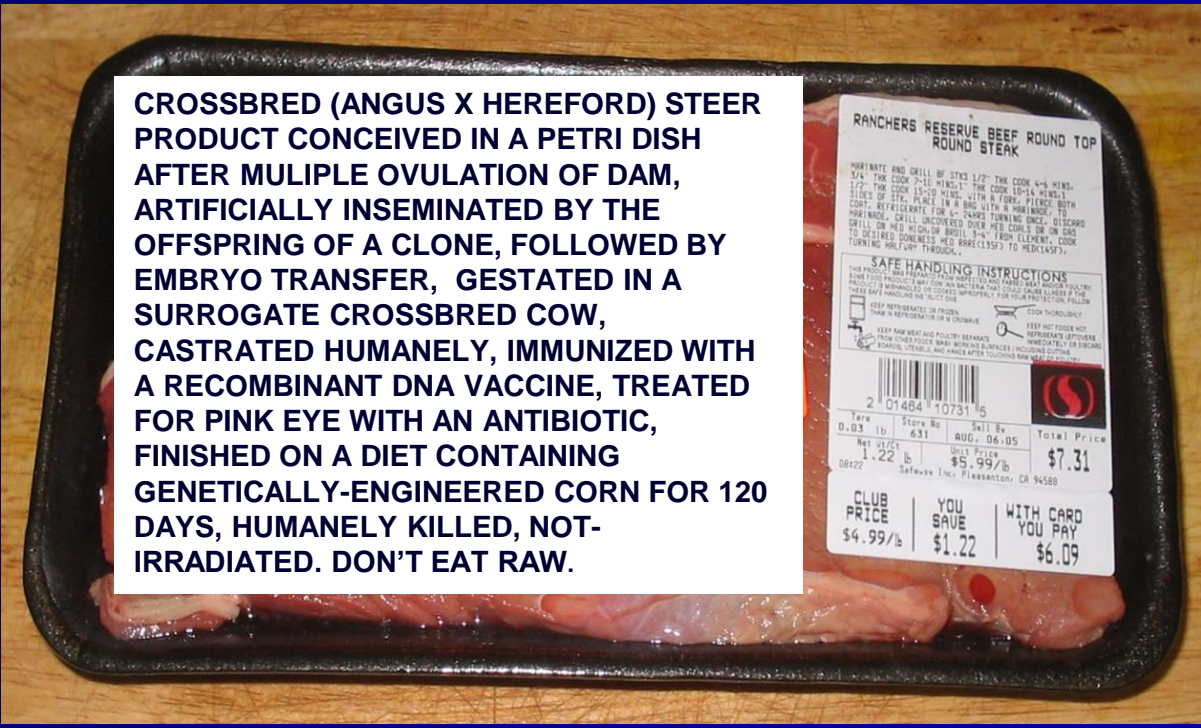






# Mandatory process-based labeling singles out GE process in absence of difference in product – there are many processes used in food production

What would be the cost of mandatory consumer “right to know” process-based labeling about all aspects of the food production process?





**Chobani uses milk from cows fed GMOs.  
How “natural” is THAT?**



**Monsanto Latte?**

**Tell Starbucks to serve  
only organic, non-GMO milk.**

**GMOiNSiDE**  
Coalition Powered by Green America





# 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>





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  5. Meat, milk and eggs from animals that have eaten GE crops is unsafe/different
  6. Food from animals that have eaten GE feed needs to carry a mandatory label to give consumers choice
  7. **Mandatory GE labeling will have no impact the price of food**



# If GE labeling becomes mandatory there are different implications if food made with GE ingredients has to be labeled vs..

Food containing ingredients derived from GE plants will have to be labeled unless....

## EXEMPTIONS

- Animals fed “GMO feed” or treated with GE drug or vaccine (e.g.rBST)
- Any processed food made with GE processing aids
- Certified Organic food
- Until July 1, 2019, tolerance threshold of up to 0.9% GE content of the processed food; the tolerance after that time is unclear

Washington Initiative. 2012. I 2570, [http://sos.wa.gov/assets/elections/initiatives/FinalText\\_285.pdf](http://sos.wa.gov/assets/elections/initiatives/FinalText_285.pdf)



**In 2013 six states (MA, MO, NM, OR, TN, and WV) considered bills without the GMO feed consumption exemption; and some retailers (e.g. Whole Foods) plan to label animal products from GE-fed animals; or to use only non-GE fed animals (e.g. Chipotle)**

**Broiler and livestock production in U.S. during 2011 reported for organic and conventional production.**

Type	Number of farms	Organic <sup>1</sup> Number animals	Total <sup>2</sup> Number animals	Organic as a Percent of Total
Broiler	153	28,644,354	8,683,067,000	<b>0.3%</b>
Beef cows	488	106,181	31,400,000	<b>0.3%</b>
Dairy cows	1,848	254,711	9,200,000	<b>2.8%</b>
Hogs	97	12,373	110,860,000	<b>&lt;0.1%</b>

<sup>1</sup>USDA. 2011 Certified Organic Production Survey.

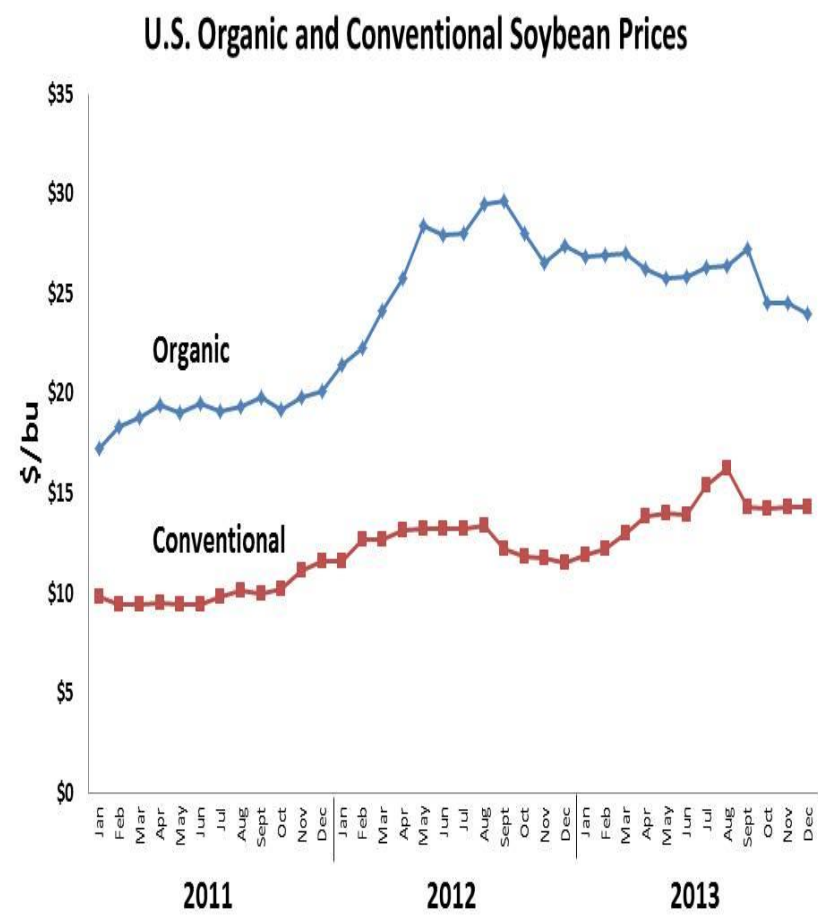
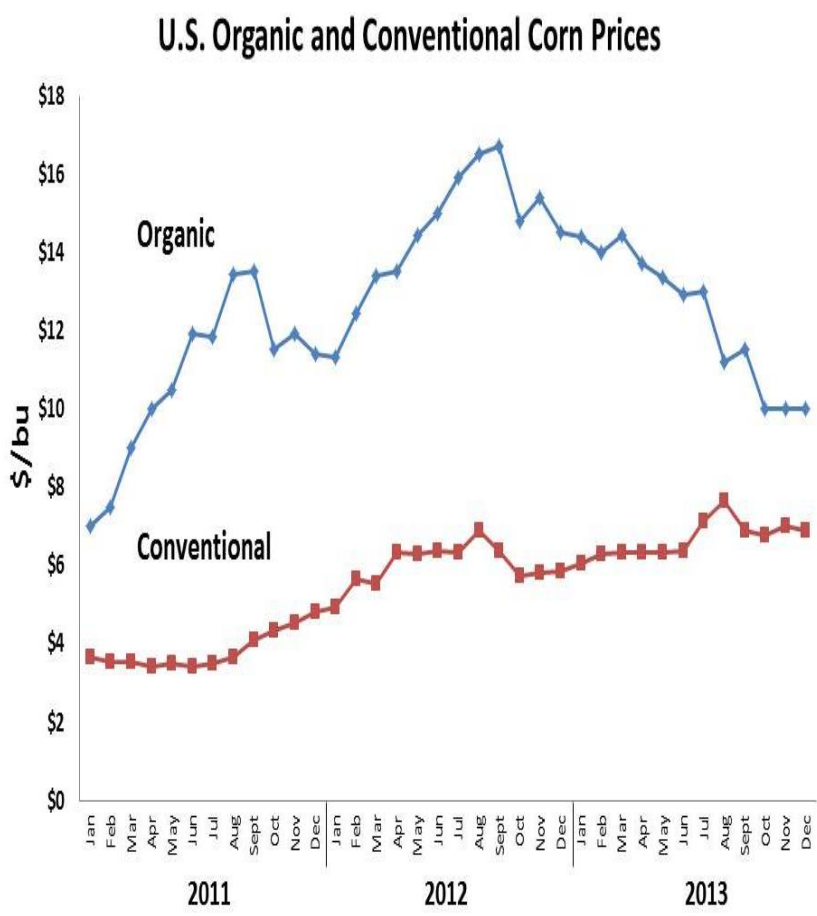
<http://usda01.library.cornell.edu/usda/current/OrganicProduction/OrganicProduction-10-04-2012.pdf>

<sup>2</sup>USDA. 2011. The USDA Economics, Statistics and Market Information System (ESMIS).

<http://usda.mannlib.cornell.edu/MannUsda/homepage.do>.



# Prices received for conventional and organic corn and soybean (\$/bushel) 2011- 2013 (USDA–NASS 2013; USDA–LPS 2013).







**USDA ERS organic price data is based on Agricultural Marketing Service Market News and other data sources, and shows monthly and annual prices for major commodities – not all comparisons are available for all years.**



- Organic milk 4.38% of total fluid milk market in 2013  
Between 2004-2007
- Retail price for organic milk ~ 3X conventional
- Retail price for organic eggs and poultry meat ~ 2X conventional
- Retail price for organic salad mix ~ 7X conventional  
Between 2010-2013
- Retail price for organic vegetables ~ 2X conventional
- Retail price for organic fruits ~ 1.5X conventional

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



# Non-GE will cost more

## Shoppers Unwilling to Pay More for Non-GMO Products

Posted Tue, 2014-02-18 10:59 by [BMM](#)

CHICAGO — The labeling of genetically modified (GMO) food is at the center of debate across the country, but the decision to buy or not buy non-GMO food often is based on price. A recent NPD food market research study on GMO awareness and concern among consumers finds that 67 percent of all primary grocery shoppers are not willing to pay a higher price for non-GMO food.

Over half of U.S. consumers express some level of concern about genetically modified organisms, but when asked to describe GMOs, many primary grocery shoppers are unclear. The NPD study, **Gauging GMO Awareness and Impact**, thinks that is likely a factor in the unwillingness of shoppers to pay a higher price for non-GMO food. Also unclear to consumers is the prevalence of GMO versus non-GMO items at the grocers. Four out of ten primary grocery shoppers feel that they mostly buy non-GMOs while the same ratio of consumers says they are not sure.



GMO corn field on the island of Oahu, Hawaii. Photo by BMM



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6. Food from animals that have eaten GE feed needs to carry a mandatory label to give consumers choice
7. Mandatory labeling will have no impact the price of food
8. **GE crops have not benefitted farmers or the environment and have resulted in a huge increase in the use of pesticides**





# Globally there are substantial benefits from GE crops

- "From 1996 to 2012, biotech crops contributed to Food Security, Sustainability and the Environment/Climate Change by: increasing crop production valued at US\$116.9 billion; providing a better environment, by saving 497 million kg a.i. of pesticides; in 2012 alone reducing CO<sub>2</sub> emissions by 26.7 billion kg, equivalent to taking 11.8 million cars off the road for one year; conserving biodiversity by saving 123 million hectares of land from 1996-2012; and helped alleviate poverty for >16.5 million small farmers and their families totalling >65 million people, who are some of the poorest people in the world.
- Biotech crops are essential but are not a panacea and adherence to good farming practices such as rotations and resistance management, are a must for biotech crops as they are for conventional crops.

International Service for the Acquisition of Agri-Biotech Applications [www.isaaa.org/](http://www.isaaa.org/) ;

Carpenter J.E. (2013). "The socio-economic impacts of currently commercialised genetically engineered crops," *International Journal of Biotechnology*, 12 (4) 249. DOI: 10.1504/IJBT.2013.059248





# In the US there have been substantial benefits from GE crops



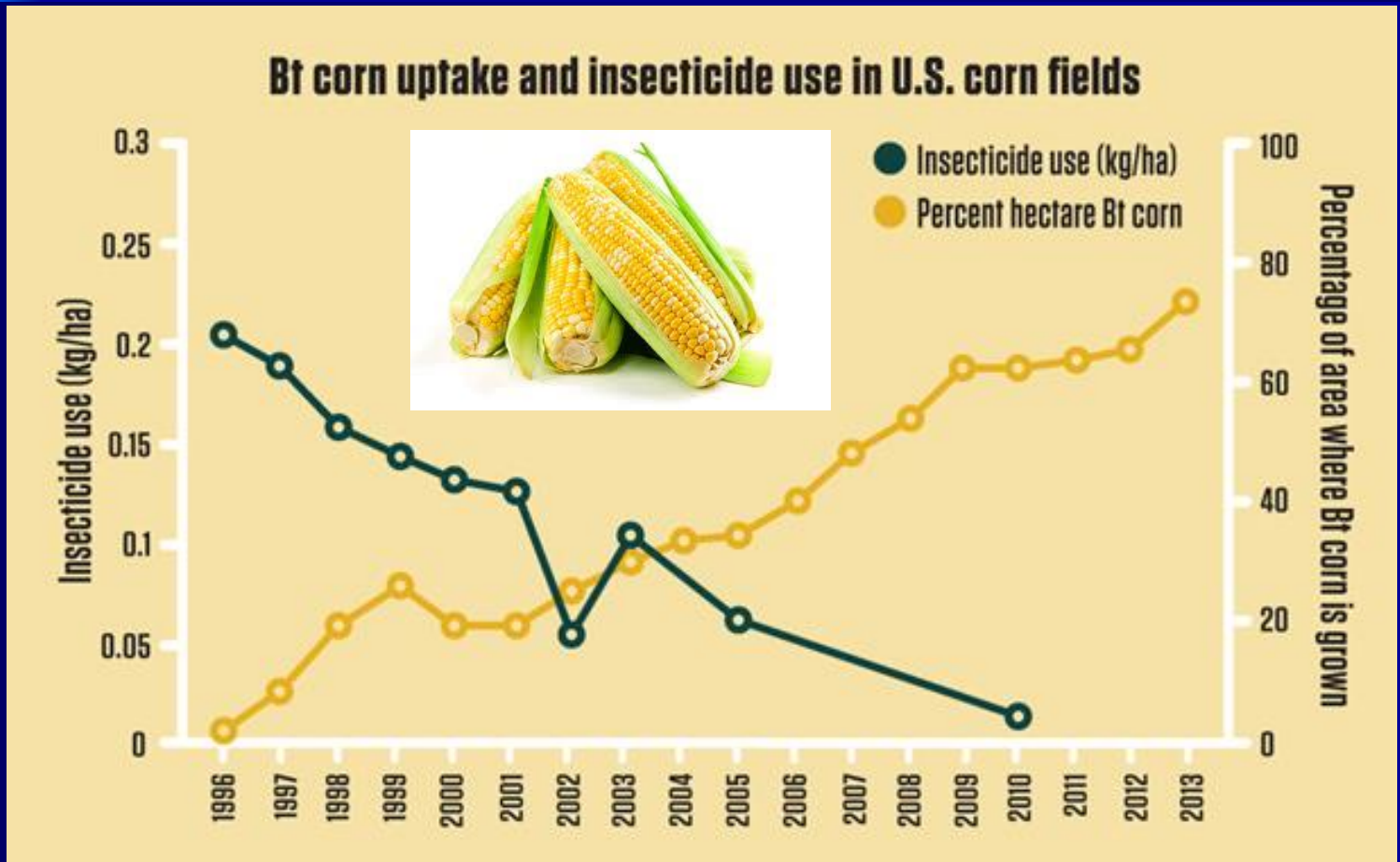
Since GE seeds were introduced in the mid-1990s, farmers have opted for these products. A recent report from the National Research Council of the **U.S. National Academy of Sciences**, "The Impact of Genetically Engineered Crops on Farm Sustainability in the United States," offers an insight as to why. The report concludes that U.S. farmers growing biotech crops "***..are realizing substantial economic and environmental benefits — such as lower production costs, fewer pest problems, reduced use of pesticides, and better yields — compared with conventional crops.***"

National Research Council. Impact of Genetically Engineered Crops on Farm Sustainability in the United States . Washington, DC: The National Academies Press, 2010. See also

Fernandez-Cornejo, Jorge, Seth Wechsler, Mike Livingston, and Lorraine Mitchell. *Genetically Engineered Crops in the United States*, ERR-162 U.S. Department of Agriculture, Economic Research Service, February 2014.



# Overall insecticide use in the United States has declined 0.6% per year



<http://www.washingtonpost.com/blogs/wonkblog/files/2013/08/bt-corn.png>



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7. Mandatory labeling will have no impact the price of food
8. GE crops have not benefitted farmers or the environment and have resulted in a huge increase in the use of pesticides
9. **The world does not need GE feed for its livestock populations**



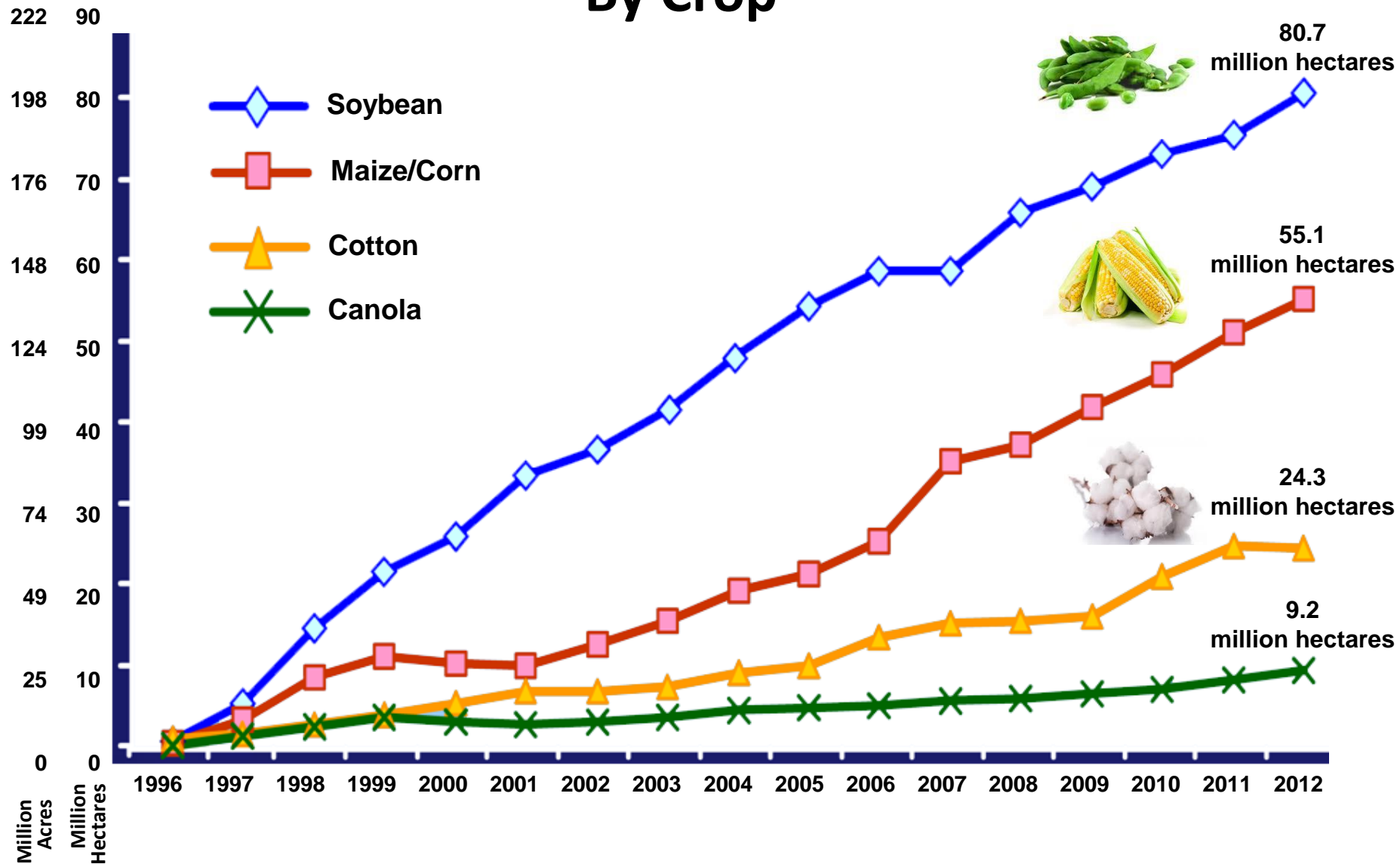
# When are the yield benefits that have been derived from adoption of GE crops?

GE technology has added 110 million tonnes of soybeans and 195 million tonnes of maize to global production of these crops since the introduction of GE crops in the mid-1990s.

Brookes G, Barfoot P: **The global income and production effects of genetically modified (GM) crops 1996–2011.** *GM Crops and Food: Biotechnology in Agriculture and the Food Chain* 2013, **4**:74–83.



# Global Area of Genetically Engineered (GE) Crops 1996 – 2012 By Crop





# Share of global crop trade accounted for by GE crops 2011/12 (million tonnes)

	Soybeans	Maize (Corn)	Cotton	Canola
Global production	238	883.5	27.0	61.6
Global trade (exports)	90.4	103.4	10.0	13.0
Share of global trade from GE producers	88.6 (98%)	70.0 (67.7%)	7.15 (71.5%)	9.9 (76%)
Share of global trade that may be GE	96.7%	67.7%	71.5%	76%

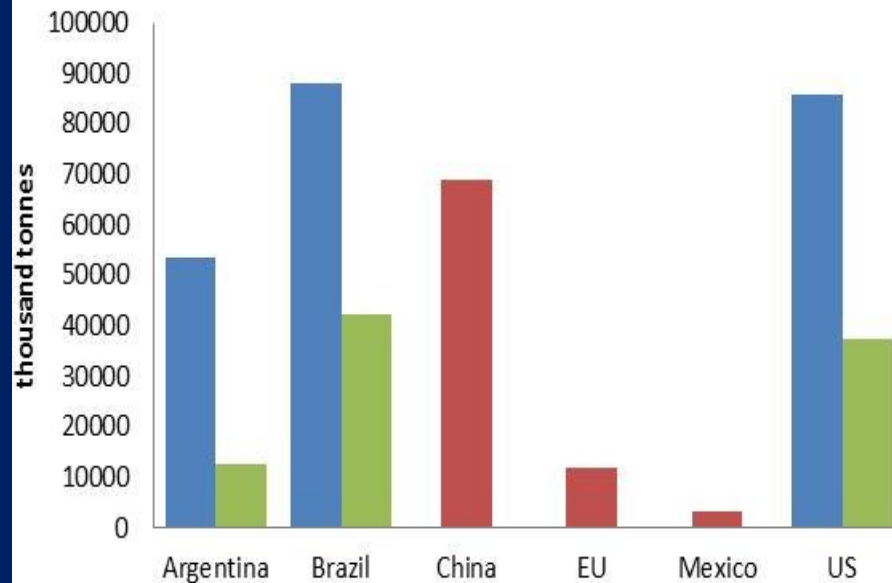
Brookes G, Barfoot P: 2013 **GM crops: global socio-economic and environmental impacts 1996–2011**. PG Economics Ltd: UK; [www.pgeconomicscouk/pdf/2013globalimpactstudyfinalreportpdf](http://www.pgeconomicscouk/pdf/2013globalimpactstudyfinalreportpdf).

# China and the EU are large importers of GE soybeans

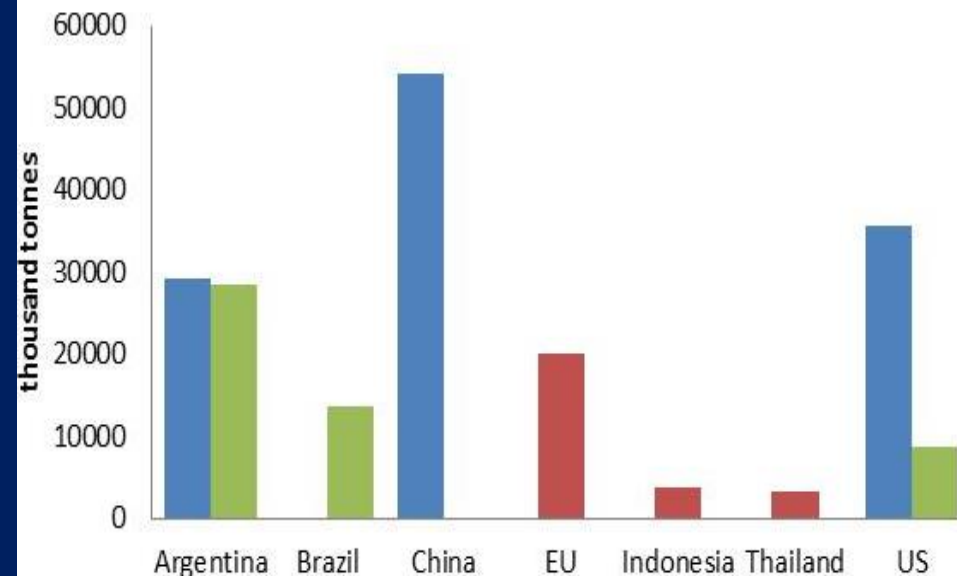
Three top producers, importers and exporters of soybeans and soybean meal (thousand tonnes)

■ Production ■ Imports ■ Exports

Soybeans - 2013



Soybean Meal - 2013



Oilseeds world market and trade. September 2013 <http://www.fas.usda.gov/oilseeds/Current>





# The EU imports a lot of GE feed to support its animal agriculture



- For climatic and agronomic reasons, the European Union (EU) is unable to produce most of the oilseed meal and other protein-rich feedstuffs required to feed its livestock
- 80% of all livestock feed in the European Union (EU) is imported
- 98% of EU soybean meal is imported from Brazil, the USA, and Argentina; ~ 80% of this imported soybean meal animal feed is GE
- If the EU were not able to import soybean protein from outside the EU it would only be able to replace 10-20% of imports by high protein substitutes, resulting in a substantial reduction in animal protein production, exports and consumption, and a very significant increase in animal protein imports and cost in the EU\*

\* Directorate-General for Agriculture and Rural Development. 2007. **Economic impact of unapproved GMOs on EU feed imports and livestock production.** [http://ec.europa.eu/agriculture/envir/gmo/economic\\_impactGMOs\\_en.pdf](http://ec.europa.eu/agriculture/envir/gmo/economic_impactGMOs_en.pdf)



# German poultry sector ends avoidance of GMO soy in feed

No Comments Posted Feb. 18th, 2014 by Reuters News Service



HAMBURG, Feb 18 (Reuters) – German poultry producers have given up a promise to consumers to avoid feeding birds with soy containing genetically-modified organisms (GMOs) because of lower supplies of non-GMO soybeans, poultry producers association BBH said on Tuesday.

Brazil, the main bulk supplier of GMO-free soybeans, was likely to cut its supplies of GMO-free soybeans by 50 percent this year partly because of cross-pollination with conventional beans, the association said.

The danger of cross-contamination between GMO and conventional crops during transport has also risen, it said.

“Feeding for chicken and turkey production in Germany without use of genetic technology can no longer be undertaken,” the association said. “Specialist feed factories for production of poultry feed requires a seamless supply chain with impeccable GMO-free soybeans, but supplies can no longer be guaranteed in the required volumes.”

The association said Germany was not alone with such problems and some British and Danish poultry producers had in the past year also given up commitments not to use GMO soybeans.

<http://www.producer.com/daily/german-poultry-sector-ends-avoidance-of-gmo-soy-in-feed/>





# Top Ten Myths about GE food and feeding GE crops to livestock



1. There is scientific uncertainty/lack of consensus about safety of GE
2. There have been no independent safety studies on GE crops
3. There have been no long term studies on the effects of GE crops
4. GE feed is making livestock populations sick (e.g. pigs with enlarged uteruses, infertility, tumors, mortality)
5. Meat, milk and eggs from animals that have eaten GE crops is unsafe/different
6. Food from animals that have eaten GE feed needs to carry a mandatory label to give consumers choice
7. Mandatory labeling will have no impact the price of food
8. GE crops have not benefitted farmers or the environment and have resulted in a huge increase in the use of pesticides
9. The world does not need GE feed for its livestock populations
10. All scientists that speak about this topic are industry shills; except those who speak negatively about it - they are brave martyrs





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.





# Summary

- Overwhelming consensus of data shows safety of GE feed and food
- No difference in milk, meat, or eggs from animals that have eaten GE feed – and no way to detect it (i.e. no “trace”) in animal products
- Labeling of products from animals that have (or have not) eaten GE feed – how much, how often, never ever will be very complicated – and prone to cheaters as no way to verify with a test
- Non-GE feed for animals will be more expensive



**16<sup>th</sup> Annual Dairy Ingredients Symposium**  
**March 26-27, 2014**

