

Biotechnology, Animal Products, and Food Safety



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Food Safety Concerns And Actions: U.S. Consumers

Consumers "extremely/very concerned about" and "actively trying to avoid" these substances:

Pesticide residues on produce	79%	42%
Hormones in meat/poultry	69%	38%
Mercury in fish	69%	43%
Antibiotics in meat/poultry	67%	35%
Genetically modified organisms (GMOs)	59%	30%
Nitrates/nitrites in produce/meat/poultry	41%	22%

SOURCE: J. Brad Morgan(2008); Packaged Facts (2006); Food Technology, March 2006.



Genetic Engineering with Recombinant DNA

- Genetically Modified Organism (GMO)
- Direct manipulation of an organism's genes
- Since a protein sequence is specified by a segment of DNA called a gene, novel versions of that protein can be produced by changing the DNA sequence of the gene

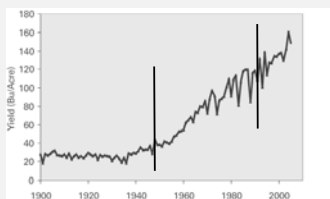


Genetically Engineered



Benefits of Genetic Engineering

Corn

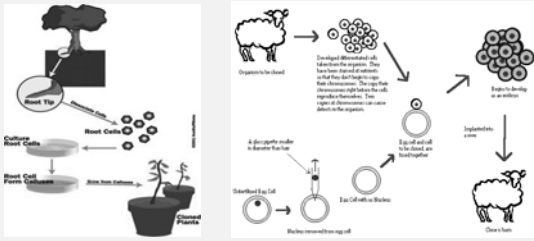


Cloning

- Somatic Cell Nuclear Transfer
- A genetic copy of the donor
- Dolly
- Benefits
 - Biotechnology
 - Preservation of Elite Seedstock



Cloning



Cloned Adult Animal



Benefits of Cloning



Are GM Foods Safe To Eat?

- Nutrient content and composition of GM crops are not different from conventional crops.
- Nutrient content and composition of meat, milk and eggs are not different between those fed GM vs. CON crops.
- No foreign DNA or proteins are found in meat, milk and eggs from animals fed GM crops.,
- Meat, milk and eggs from animals fed GM crops are as safe or safer than (e.g., fewer pesticide residues) those fed CON crops.



SOURCE: J. Brad Morgan(2008); Federation of Animal Science Societies (2000).

Scientific Evidence Regarding Genetic Engineering

- EPA decided to allow farmers to continue growing GM corn, expressing confidence that it does not pose risks to human health or the environment.
- FSA-France conducted a \$64 million study and concluded that "not only do GM foods pose no danger to humans, they are safer than normal foods."
- GAO concluded "GM foods pose no greater health risks than conventional foods; consumers who ate bioengineered foods were not at higher risk of allergies or toxic reactions."



SOURCES: J. Brad Morgan(2008); Florida Times-Union (2001); Reuters (2002).

Food Products From Livestock That Eat Biotech Crops



- CAST examined regulatory assessments on GM crops, looked at results of feeding studies in farm animals, and examined what happens when animals consume various proteins and DNA.
- **Conclusion:** "Meat, milk and eggs produced by farm animals fed biotechnology-derived crops are as wholesome, safe and nutritious as similar products produced by animals fed conventional crops."

SOURCE: John M. Bonner (Council for Agricultural Science and Technology) July 2006.

Consumer Groups Oppose Food From Cloned Animals



- A consumer lobby, the Center for Food Safety, filed a legal petition asking FDA to launch a moratorium on food from cloned animals.
- Consumer Federation of America criticized FDA for not making its full risk assessment or scientific studies available for comment.
- Both groups questioned whether consumers would buy products from cloned animals.
- Opposition to food from cloned animals is expected from those with moral arguments and animal welfare groups amid reports that claim animal cloning research has led to premature deaths and abnormalities.

SOURCE: foodproductiondaily.com (October 25, 2006).

Consumer Perception of Products From Clones



Is It Safe to Eat Cloned Meat?

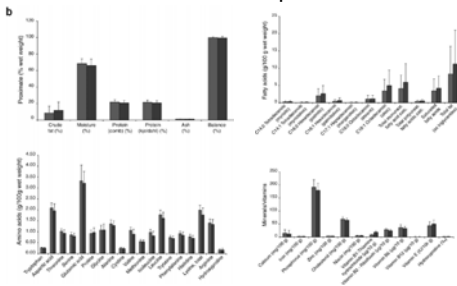
- “The meat & milk from clones of cattle, swine, and goats, and the offspring of clones from any species traditionally consumed as food, are as safe to eat as food from conventionally bred animals.”
- No difference in labeling



SOURCE: U.S. Food and Drug Administration (January 15, 2008)

Products From Clones

- No “New” substances in the products



Are Products from Clones Being Marketed?

- Previously- a voluntary moratorium was on food from cloned animals
- Soon, this probably will be lifted
- However, process with sheep/lamb will continue



SOURCE: U.S. Food and Drug Administration (January 15, 2008)

- Concern regarding use of genetically modified (GMOs) in agriculture was brought to consumers' attention worldwide when Greenpeace developed clever posters featuring Tony the Tiger™ on Kellogg's Genetically Modified Frosted Flakes of Corn – and calling it "Frankenfood."

- Years later, in an interview for the Florida Times-Union, Patrick Moore (co-founder of Greenpeace) said "The campaign of fear now being waged against genetic modification is based largely on fantasy and a complete lack of respect for science and logic."



Patrick Moore

SOURCE: G.C. Smith *et al.* (2006) Conventional, Natural, Grass-Fed & Organic Beef.

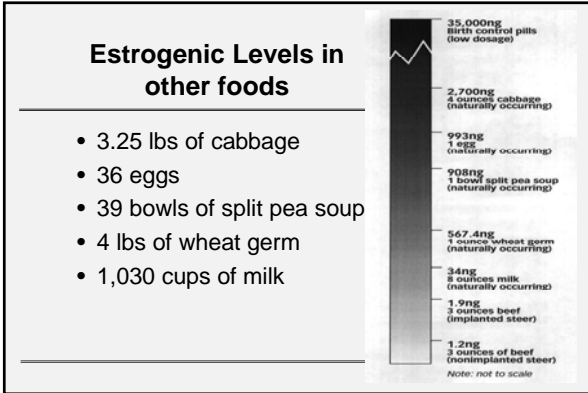
WTO ruling against EU ban on beef with hormones a 'victory': U.S. official

- January 1, 1989- EU ban on meat imports from implanted animals
- March 31, 2008- World Trade Organization's announced that ban remains scientifically unjustified would be a boon to U.S. beef producers — as well as EU consumers.


Hormones in Meat

- Estrogenic levels in beef
- Using Beef as birth control
 - Beef from a NON-implanted steer
 - 29,167 3-ounce steaks per day
 - Beef from an implanted steer
 - 18,421 3-ounce steaks per day





Advocates Against rBGH Milk File Citizens Petition




- Cancer Prevention Coalition, Organic Consumers Association and Family Farm Defenders filed a petition (February 26, 2007) with FDA.
- It requests immediate suspension of approval of rBGH based on "imminent hazard," citing Food, Drug & Cosmetic Act law.
- The groups claim there is evidence of increased risks of cancer from the consumption of milk from cows injected with rBGH.


SOURCE: J. Brad Morgan(2008); Feedstuffs (February 26, 2007).

Can BST Given To Dairy Cows Endanger Personal Or Public Health?

- Gordon Niswender – BST (also called BGH) will have no effect on humans because it is not biologically active in humans and, when eaten, is broken down (to amino acids) in the human digestive tract.
- D.N.R. Veeramachaneni – BST would have no effect on humans, even if it was injected into them in pure form, because BST does not bind to human growth hormone (HST) receptors.



Gordon Niswender, PhD



D.N.R. Veeramachaneni, BVSc, MSc-Vet, PhD

SOURCE: J. Brad Morgan(2008); G.C. Smith (2006). Conventional, Natural, Grass-Fed & Organic Beef.

Questions?
