

Labeling and Consumer Behavior

Jayson L. Lusk

Regents Professor and Willard Sparks Endowed Chair

Oklahoma State University

jayson.lusk@okstate.edu

www.jaysonlusk.com

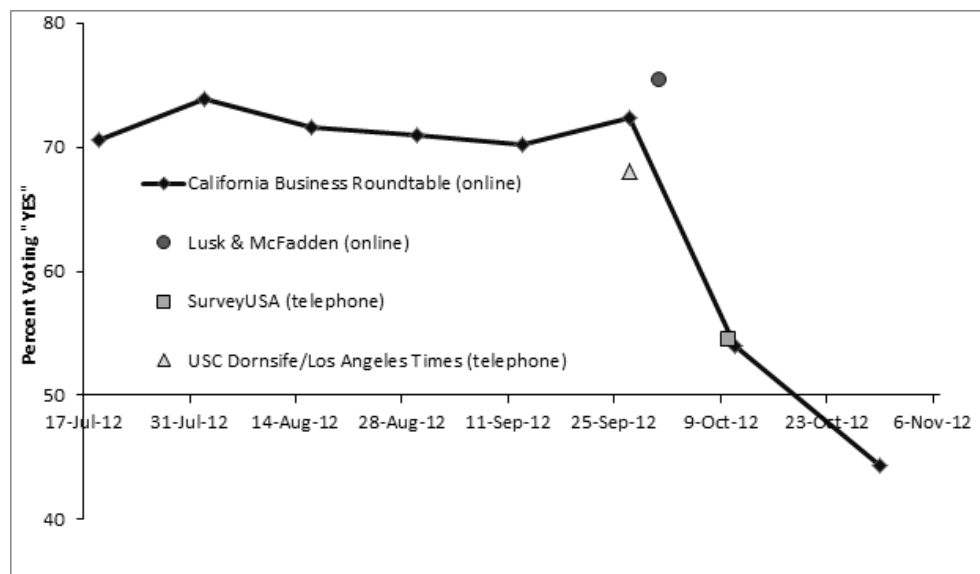
[@JaysonLusk](#)

Introduction

- **Difficult to find a more heavily researched topic than consumer aversion to GM food**
 - Search for ‘consumer GM food’ yielded 277,000 hits on googlescholar.com (212% increase since 2010)
 - Search for ‘WTP GM food’ yielded 6,060 hits on googlescholar.com (57% increase since 2010)
 - were it not for consumer concerns about GM food, the economic analysis of GM food would amount to little more than a traditional analysis of technology adoption
 - on the one hand there seems to be general consensus that information is needed on consumer preferences for GM food, and yet on the other hand such work is difficult to summarize and is often looked upon with distrust

Background

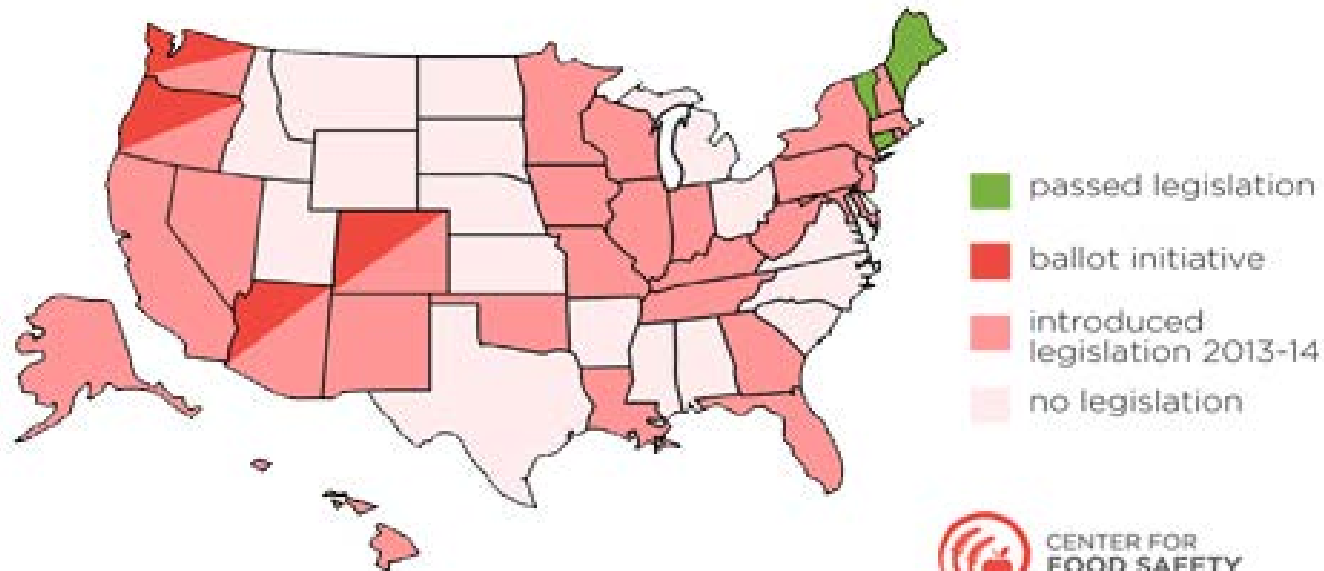
- **State ballot initiatives mandating GM labels**
 - Oregon (30% vs. 70%) in 2003
 - California (48.6% vs. 51.4%) in 2012
 - Washington (48.9% vs. 51.1%) in 2013
 - Colorado (34% vs. 66%) in 2014
 - Oregon (49.8% to 50.2%) in 2014
 - *all have failed*



Background

- **State legislative action has been more successful**
 - Connecticut and Maine in 2013 (with contingency)
 - Vermont (no contingency) in 2014 (effective July 1, 2016)
 - Jackson and Josephine Counties in Oregon banned in 2014
 - Maui County in Hawaii banned in 2014
 - *Some are being legally contested*
- **To come?**
 - New York, New Mexico, . . .
 - Federal legislation
 - “Safe and Accurate Food Labeling Act of 2015” backed by many farm groups would block state efforts to mandate labeling; passed House but not yet the Senate
 - “Genetically Engineered Food Right-to-Know Act of 2015”

GE FOOD LABELING: STATES TAKE ACTION





[The DARK Act](#)

[DARK Act Death Star](#)

[Why Label?](#)

[About GMO Foods](#)

[Press](#)

[Blog](#)

[Take Action](#)



Video:
Celebrity moms ask
big food companies to
support GMO labeling

**TAKE
ACTION:**
Tell the Senate
and White
House to
oppose
**the DARK
Act NOW**



Labeling: The Issues

- **Pro Label**

- Very popular (polls with 80%+ favorability)
- “right to know”
- adding labels is practically costless
- GMOs are “scary”



- **Anti Label**

- payday for trial lawyers and special interests
- choice already exists
- labels will be costly for consumers (maybe?)
- science supports GMO safety
- mandatory labels are misleading suggesting GMOs are unsafe
- lack precision



Effect on Choice

- Will mandatory labeling increase choice?
 - There currently is some choice in the US market via voluntary labeling
 - The EU experience is revealing though not perfectly analogous
 - Could labels increase perceived control and reduce risk perception?



Labeling Costs

- **How expensive is mandatory labeling?**
 - **Adding a small label is indeed a trivial cost**
 - A few dollars per person each year



- **The much larger costs depend on:**
 - **Enforcement and administrative costs**
 - **WA study: \$3.4 million over six years in WA alone**
 - **How consumers respond to the label**
 - **How food companies respond to the label**
 - **If competitive pressures among companies leads to a move away from GM ingredients:**
 - ❖ **Lesser study: \$500 per family per year across US**
 - ❖ **Alston/Sumner study: \$1.2 billion per year in CA alone**
 - **Impacts on innovation**

Signaling Effect

- **What does the addition of a mandatory label imply to the average consumer about the technology?**

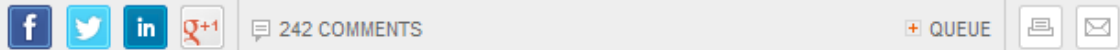


“Legally mandating such a label can only serve to mislead and falsely alarm consumers.”

http://www.aaas.org/news/releases/2012/media/AAAS_GM_statement.pdf

Don't Mandate Labeling for Gene-Altered Foods

By [Cass R. Sunstein](#) | May 12, 2013 5:00 PM CT



Should the government [require](#) companies to label food that contains genetically modified organisms?

Last November, California voters rejected a ballot initiative that would require such labeling, but bills that would do so were recently introduced in both the U.S. House and Senate. Invoking “the right to know,” a lot of people support those bills.



About [Cass R. Sunstein](#)

Cass R. Sunstein, the former administrator of the White House Office of Information and Regulatory Affairs, is ...
[MORE](#)

In the abstract, the [argument](#) for compulsory labeling seems exceedingly powerful. But there is a risk that a compulsory label for GM food would confuse, mislead and alarm consumers, potentially causing economic harm, not least to consumers themselves.

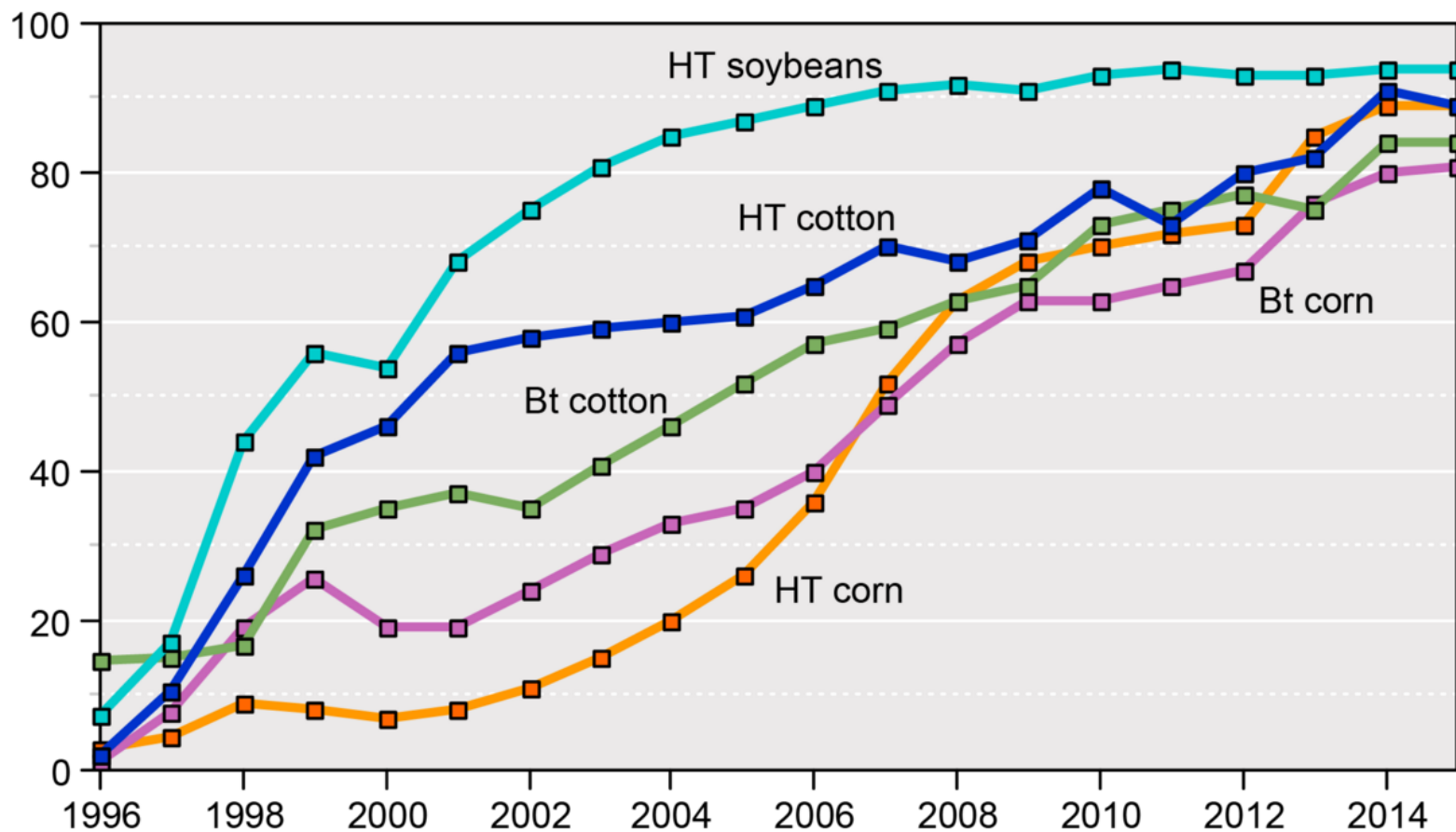
“GM labels may well mislead and alarm consumers, especially (though not only) if the government requires them. Any such requirement would inevitably lead many consumers to suspect that public officials, including scientists, believe that something is wrong with GM foods -- and perhaps that they pose a health risk.”

“Government typically requires labeling because it has identified such a risk (as in the case of tobacco). . . A compulsory GM label would encourage consumers to think that GM foods should be avoided.”

Context

Adoption of genetically engineered crops in the United States, 1996-2015

Percent of planted acres



Context

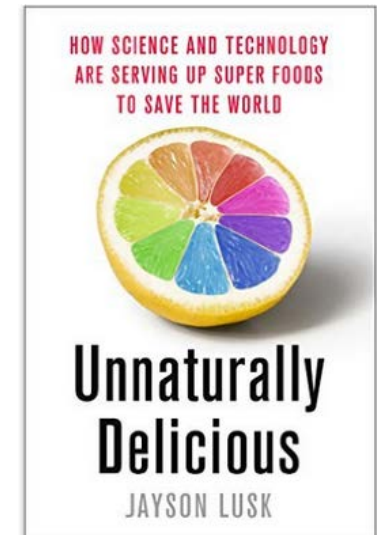
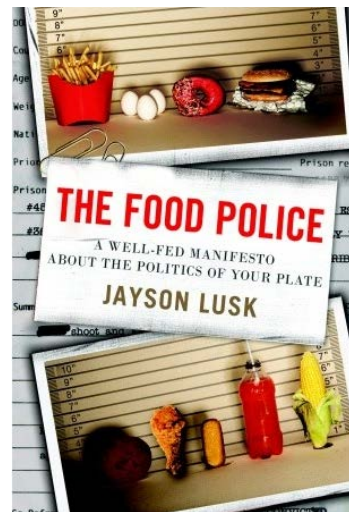
- **Large volume of economic research suggests the gains from biotech adoption are sizable; removal of gains would have negative economic consequences**

Context

- **Meta analysis by Klumper and Qaim (2014)**
 - **“On average, GM technology adoption has reduced chemical pesticide use by 37%, increased crop yields by 22%, and increased farmer profits by 68%. Yield gains and pesticide reductions are larger for insect-resistant crops than for herbicide-tolerant crops. Yield and profit gains are higher in developing countries than in developed countries.”**

Opportunity Costs

- If market environment is hostile to biotechnology, what future innovations might we give up?
- Larger costs may be the forgone innovations we never see
- Competitive positions in agriculture relative to ROW?

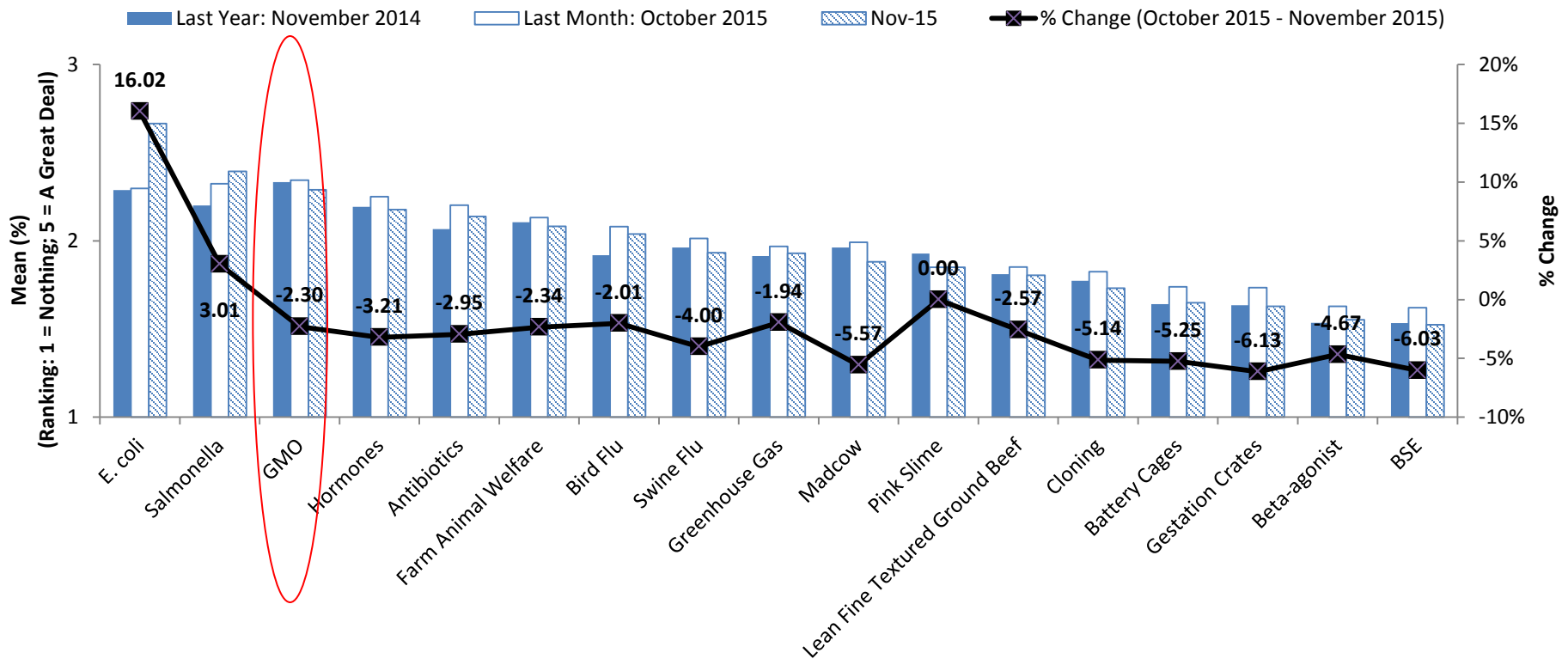


How Concerned are Consumers?

**Is Concern Increasing or
Decreasing?**

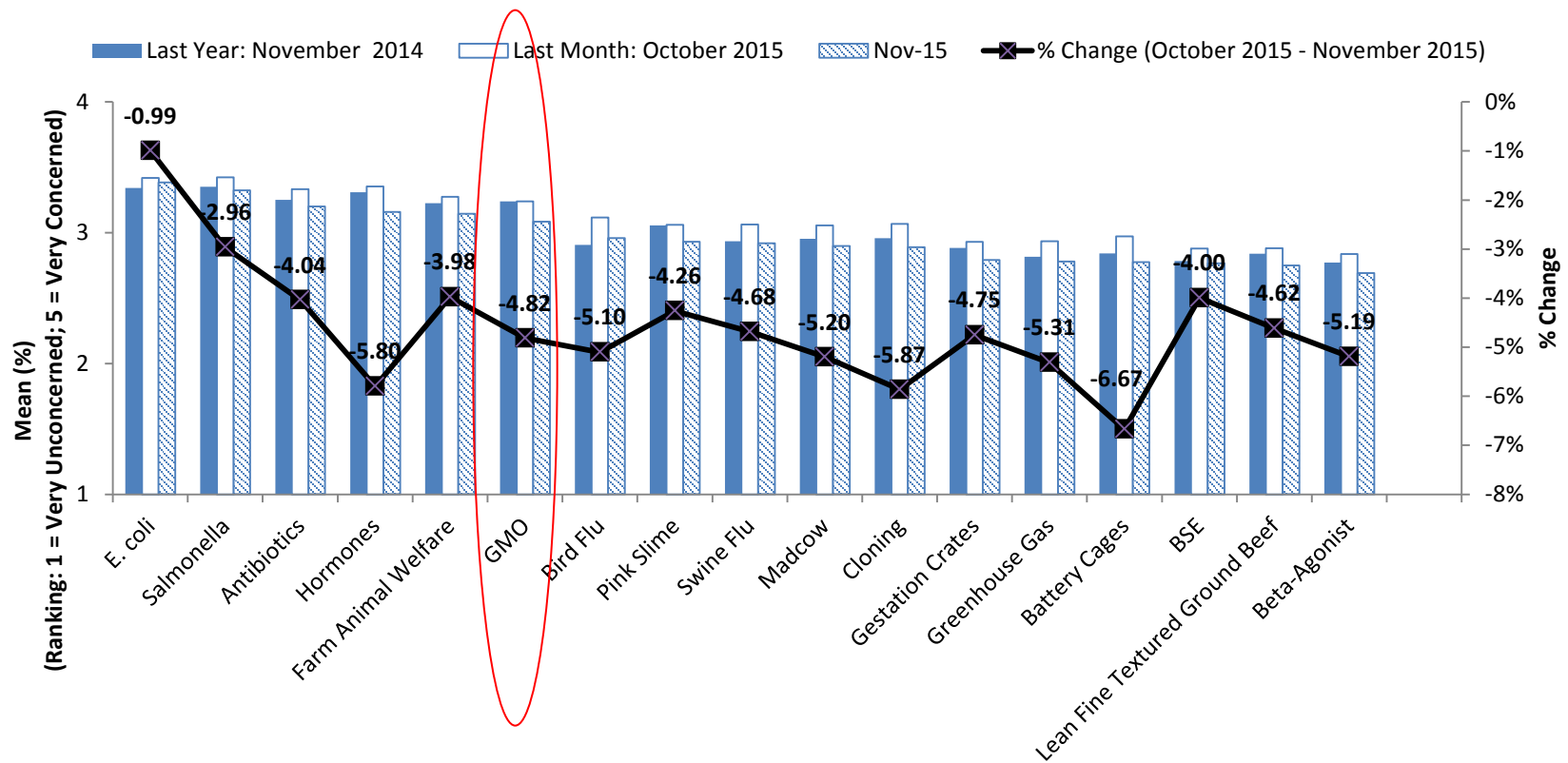
Food Demand Survey (FoodS)

Awareness in News



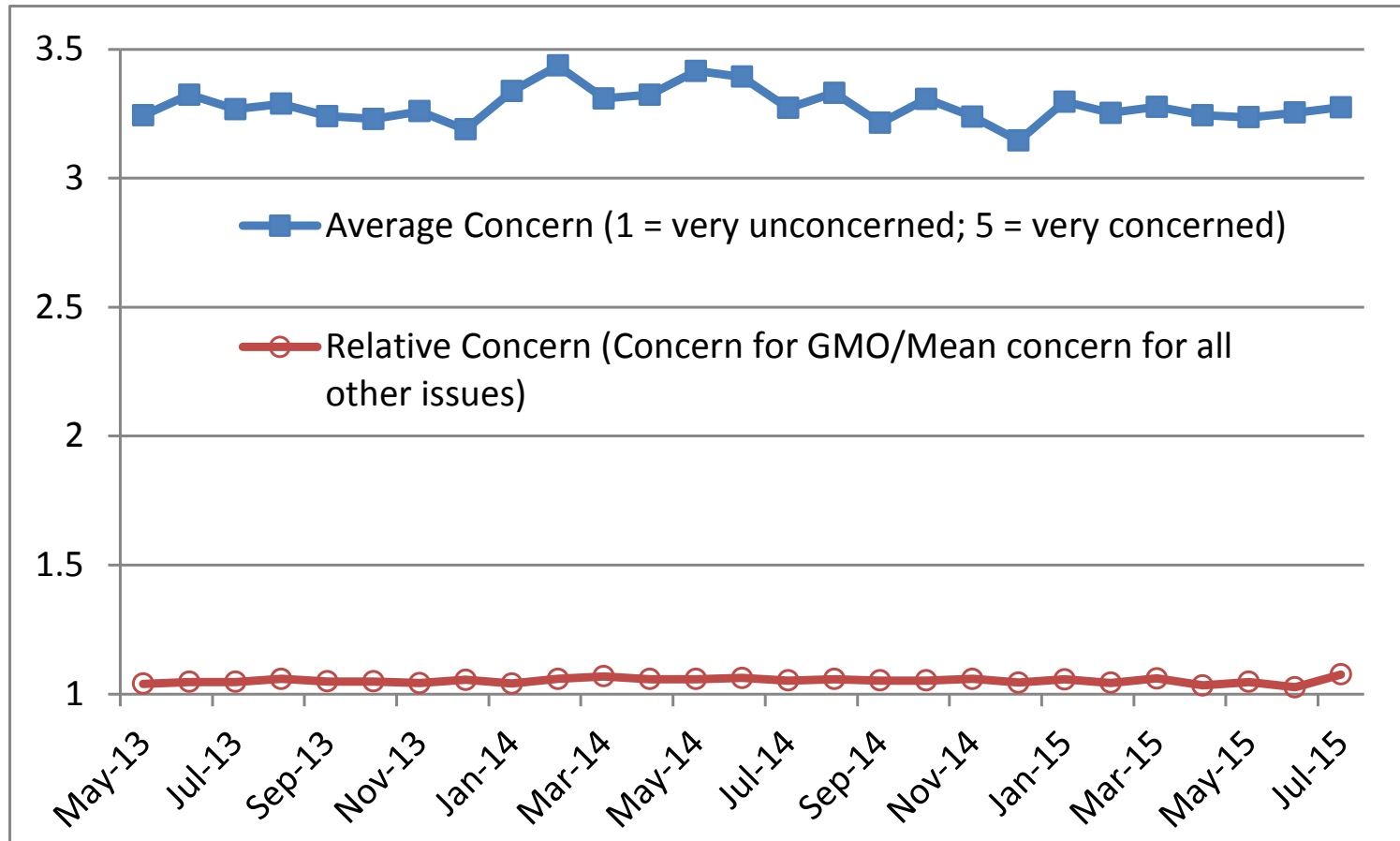
Food Demand Survey (FoodS)

Concern when eating food



Food Demand Survey (FoodS)

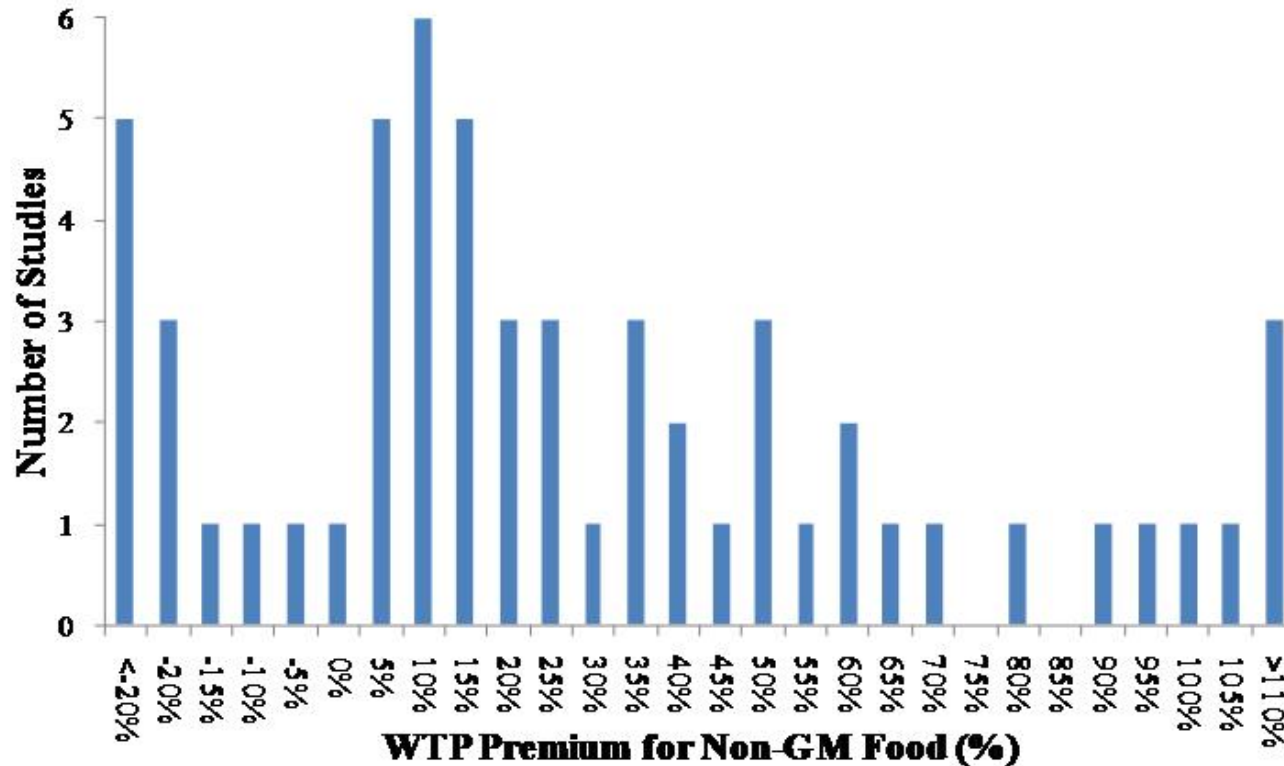
Concern when eating food



Preferences Measured by WTP

- **Most studies suggest consumers are willing to pay premiums to avoid GM foods**
- **Yet foods advertised as “GM free” have almost no market penetration in the US**

WTP Premiums for non-GM food



Distribution of Willingness-to-Pay Premiums for Non-Genetically Modified Foods over Genetically Modified Foods from Fifty-Seven Studies Reviewed by Lusk et al. (2005)

WTP

- **Results from meta analyses:**
 - Lusk et al. (2005); 46 estimates; average premium for non-GM foods 42% (weighted estimate = 25%)
 - Dannenberg (2008); 108 estimates; average premium for non-GM food of 46%
 - Results vary widely by type of study; decreasing over time
- **With such high WTP, why so little “non-GM” in U.S.?**
 - Fernandez-Cornejo and Caswell (2006), “In the United States, many products contain GE ingredients, and the demands for these products apparently have been unaffected by negative opinions about biotechnology expressed in surveys. A few specialty brands are marketed as ‘GE free,’ but they represent a small percentage of supermarket sales.”

Grocery Scanner Data

	Market share - 2013		
	conventional	organic	non-GM
oil	95.8%	3.9%	0.3%
chips	91.5%	7.2%	1.3%
cereal	96.8%	2.3%	0.9%
ice cream	97.7%	0.4%	1.9%

	Avg price premiums 2009-2013	
	organic	non-GM
oil	109.0%	58.3%
chips	18.5%	30.4%
cereal	19.2%	28.0%
ice cream	84.3%	1.1%

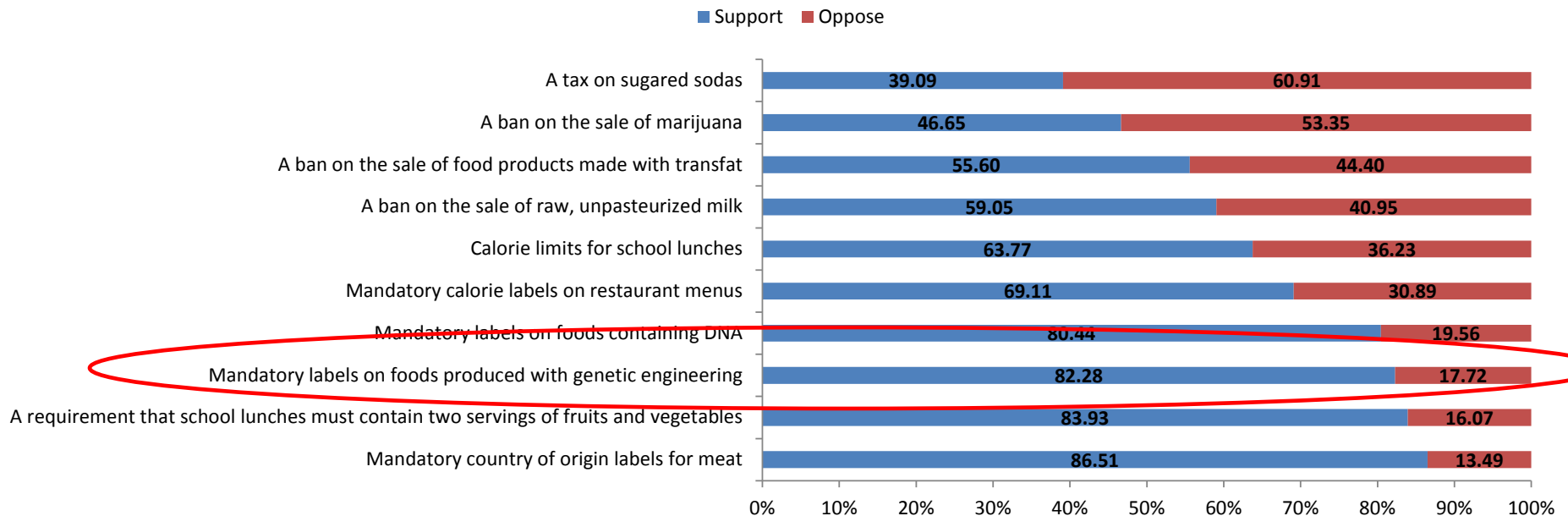
WTP – what gives?

- **Are the WTP estimates obtained from surveys and experiments wrong?**
- **Are the costs of supplying GM food prohibitively high compared to WTP?**
- **Is demand for “GM free” cannibalized by demand for “organic?”**
- **Is it a lack of information?**
 - **consumers lack the information that would translate the WTP observed in consumer studies into market behavior**
 - **consumer research, by asking people what they are WTP for non-GM food, serves to inform people about modern agricultural production practices**

Consumer Preferences for GMO Labels

Preferences for GMO Labeling

- **GMO labeling very popular in polls (Jan 2015)**

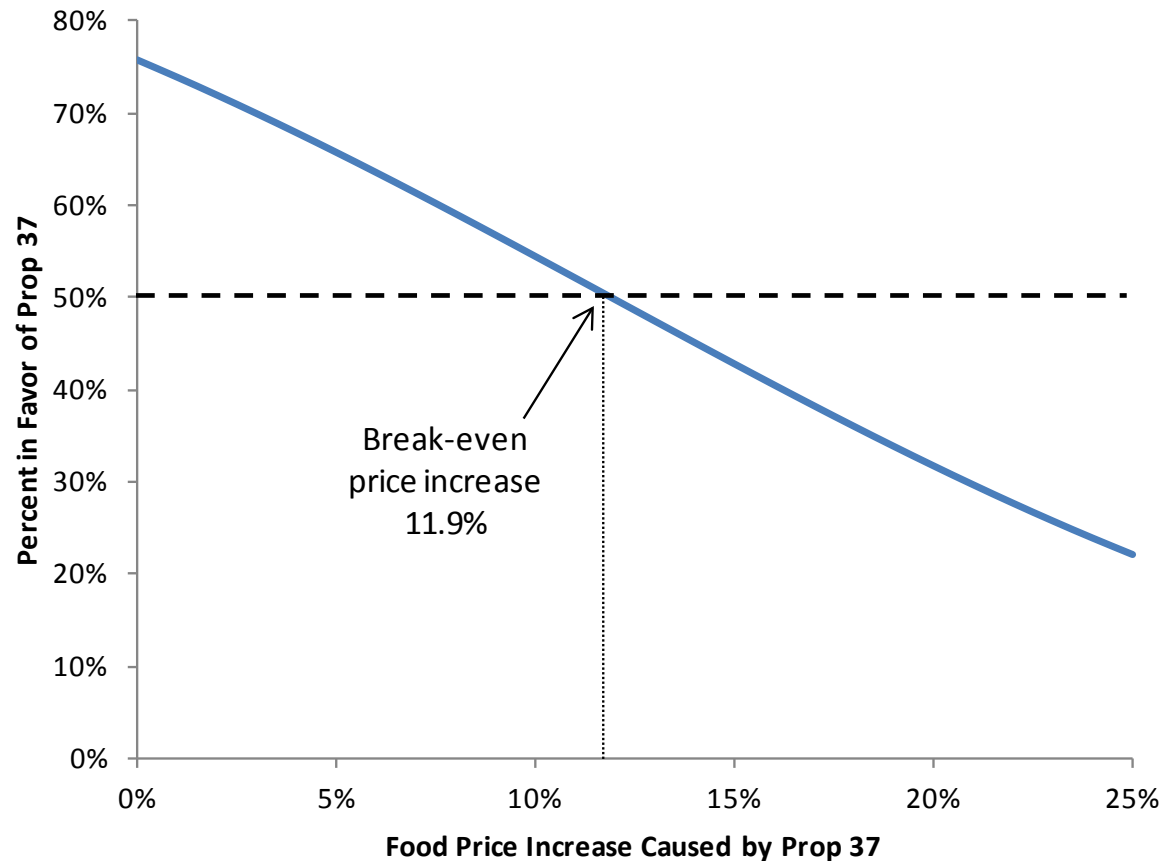


Preferences for GMO labeling

- **But . . .**
- **Consumers rarely mention biotechnology when asked open ended questions about labeling**
- **Consumers are rarely presented with costs**

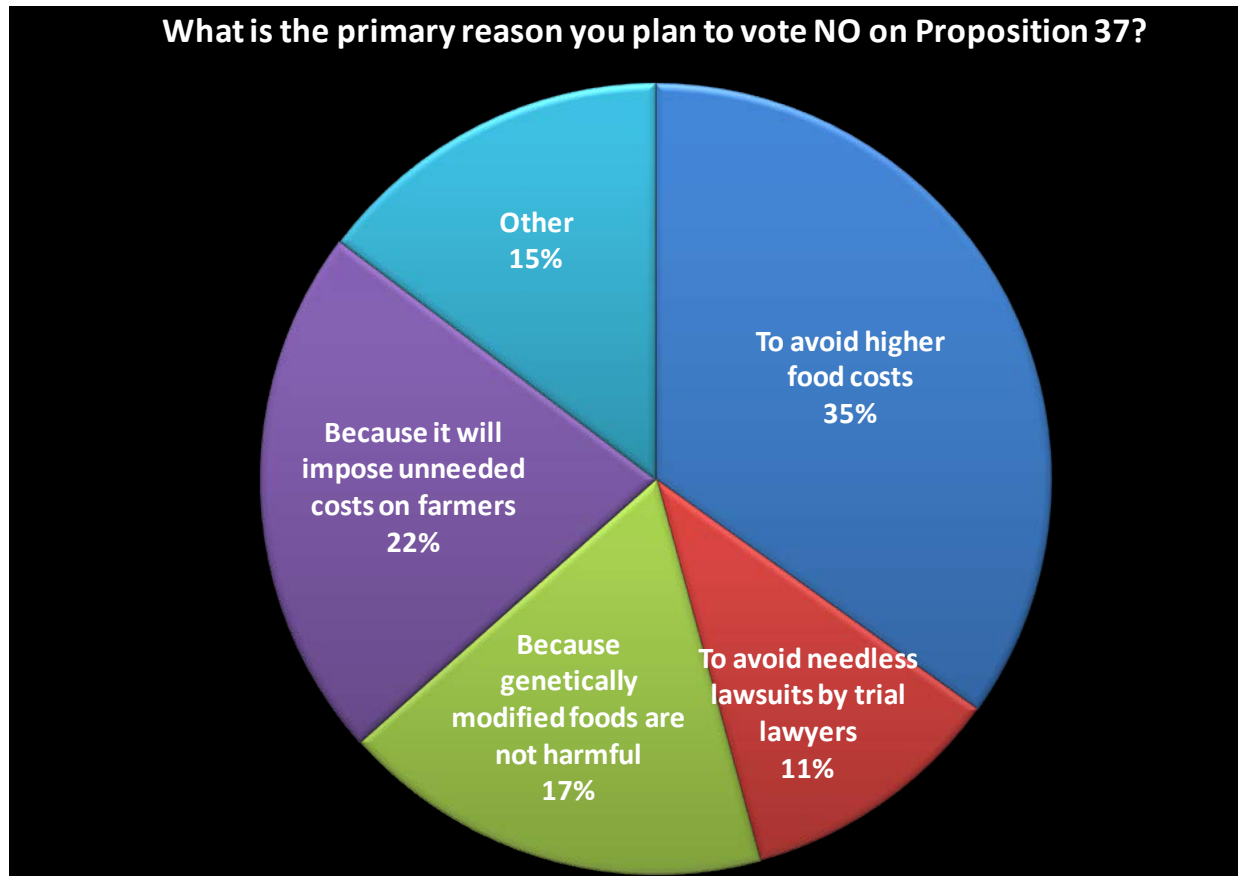
Prop 37 Survey

- People are sensitive to cost (CA, Oct 2012)



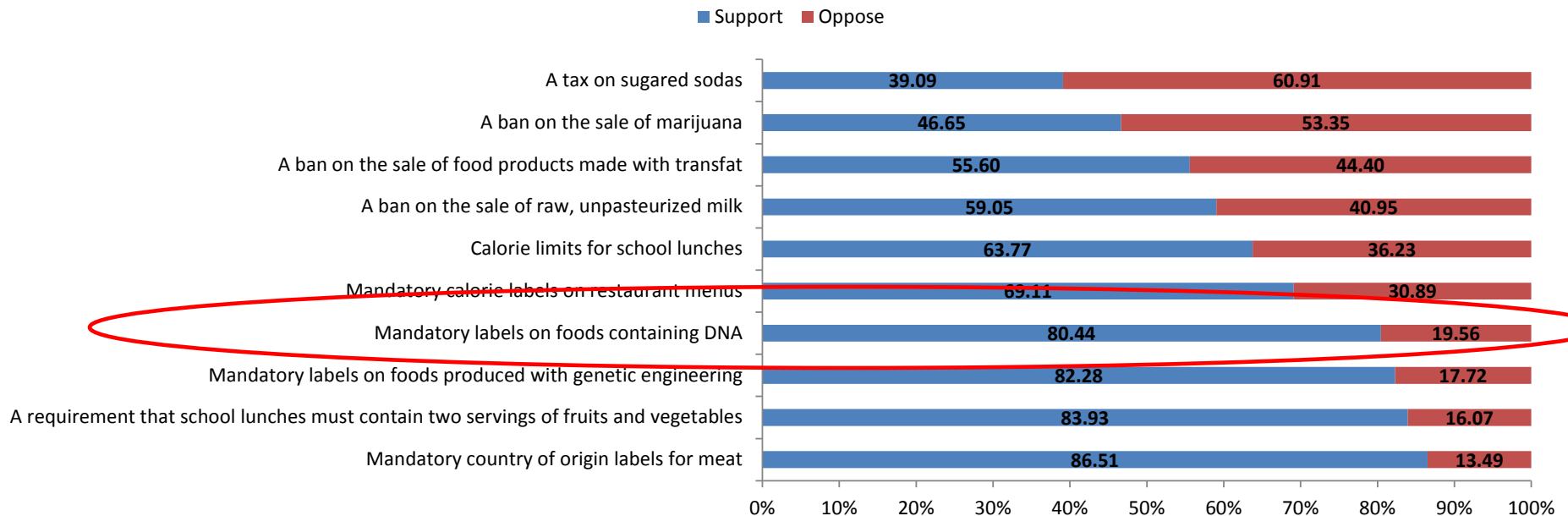
Prop 37 Survey

- Many people are sensitive to cost



Preferences for GMO Labeling

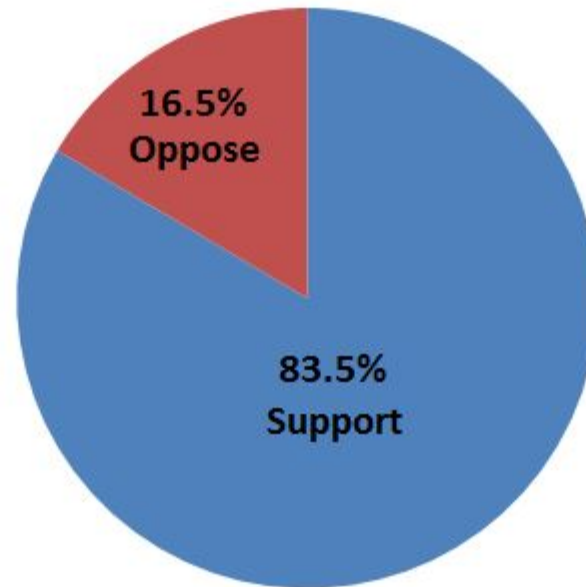
- BUT . . .**



Preferences for GMO Labeling

- **When asked in isolation (Feb 2015)**

“Do you support or oppose mandatory labels on foods that would indicate the presence or absence of DNA?”

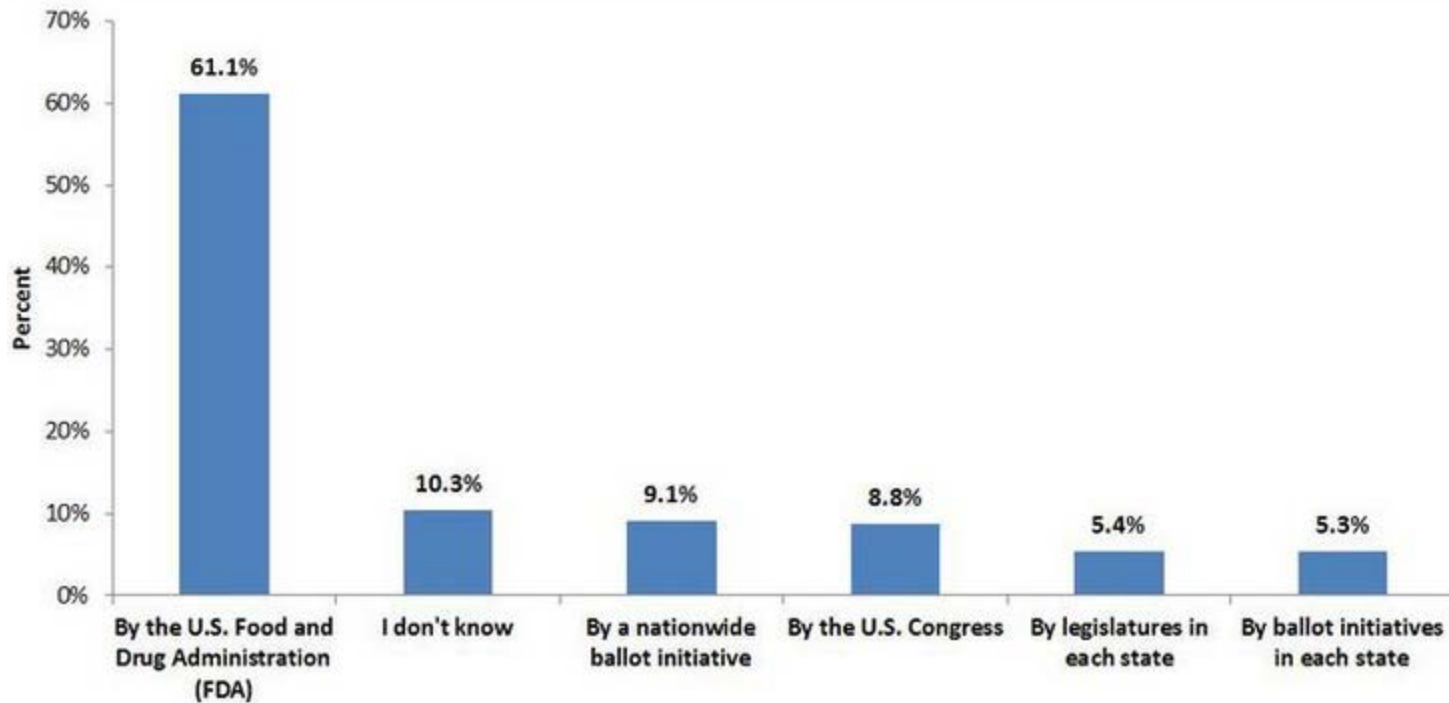


Source: Food Demand Survey (FooDS), Oklahoma State University, February 2015
<http://agecon.okstate.edu/faculty/publications/5010.pdf>

N=1,001
Sampling error = +/- 3%

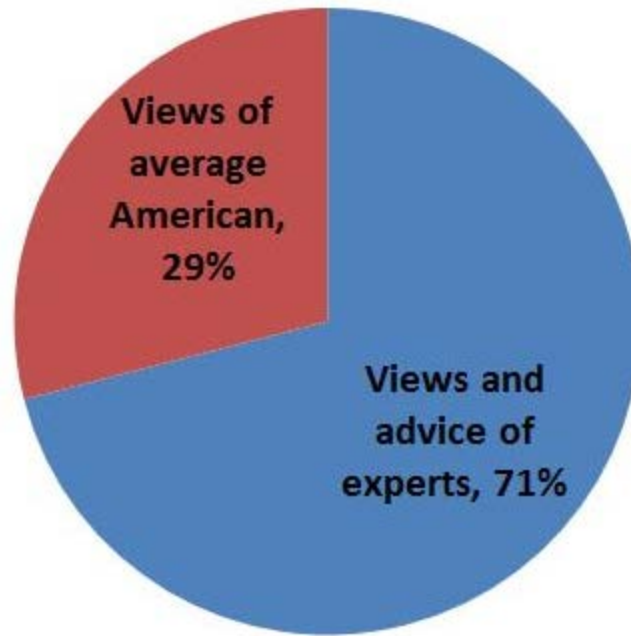
Preferences for GMO Labeling

- How should issue of mandatory GMO labeling be decided? (May 2015)



Preferences for GMO Labeling

- **Decisions about labeling of GMO food should be mainly based on . . . (July 2014)**



Actual Votes on GMO Labeling

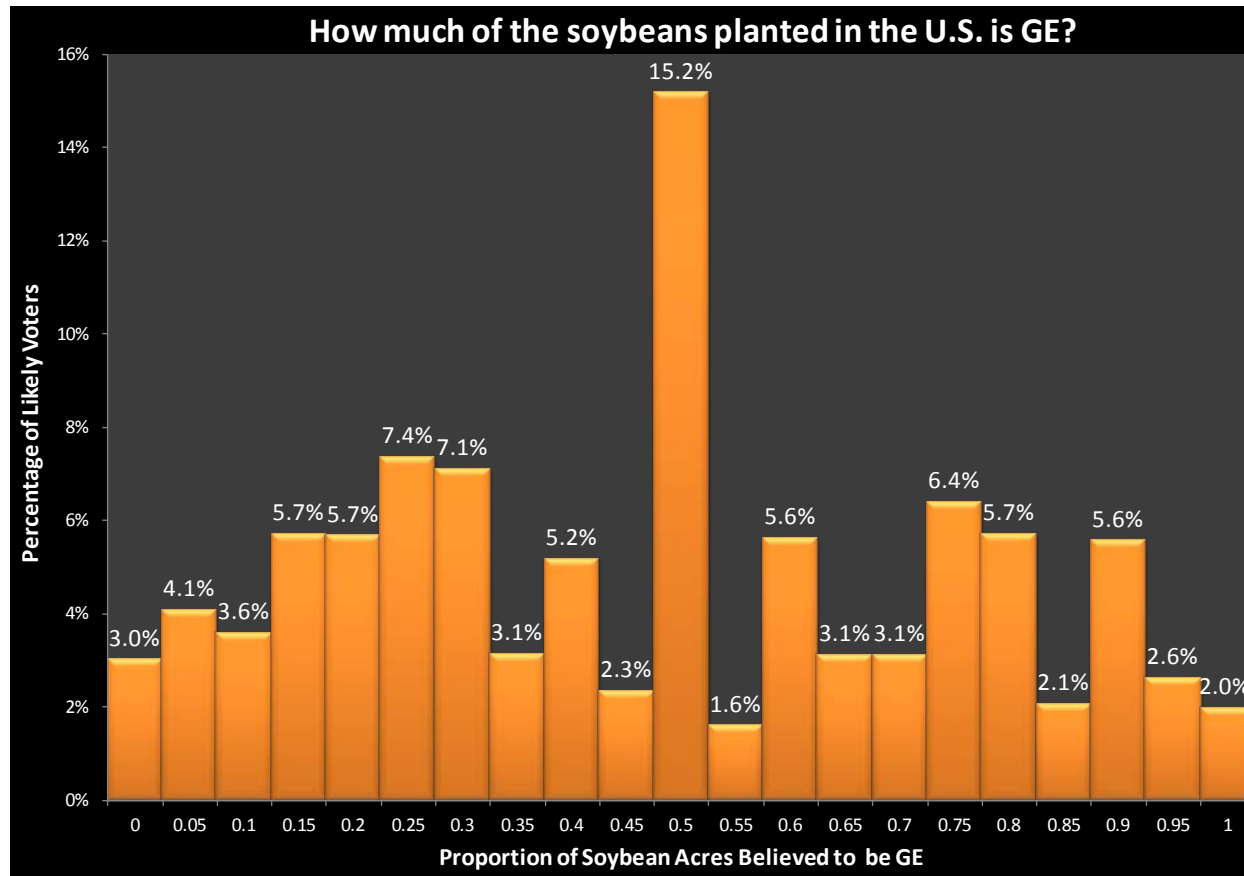
- **We don't need to ask questions about preferences for labeling**
- **Look at the votes**
 - all give state initiatives have failed

What does this tell us?

- **Consumers don't know much about GMOs**
- **They don't trust their fellow consumers with votes on GMO labeling**
- **Consumers are persuaded by information**

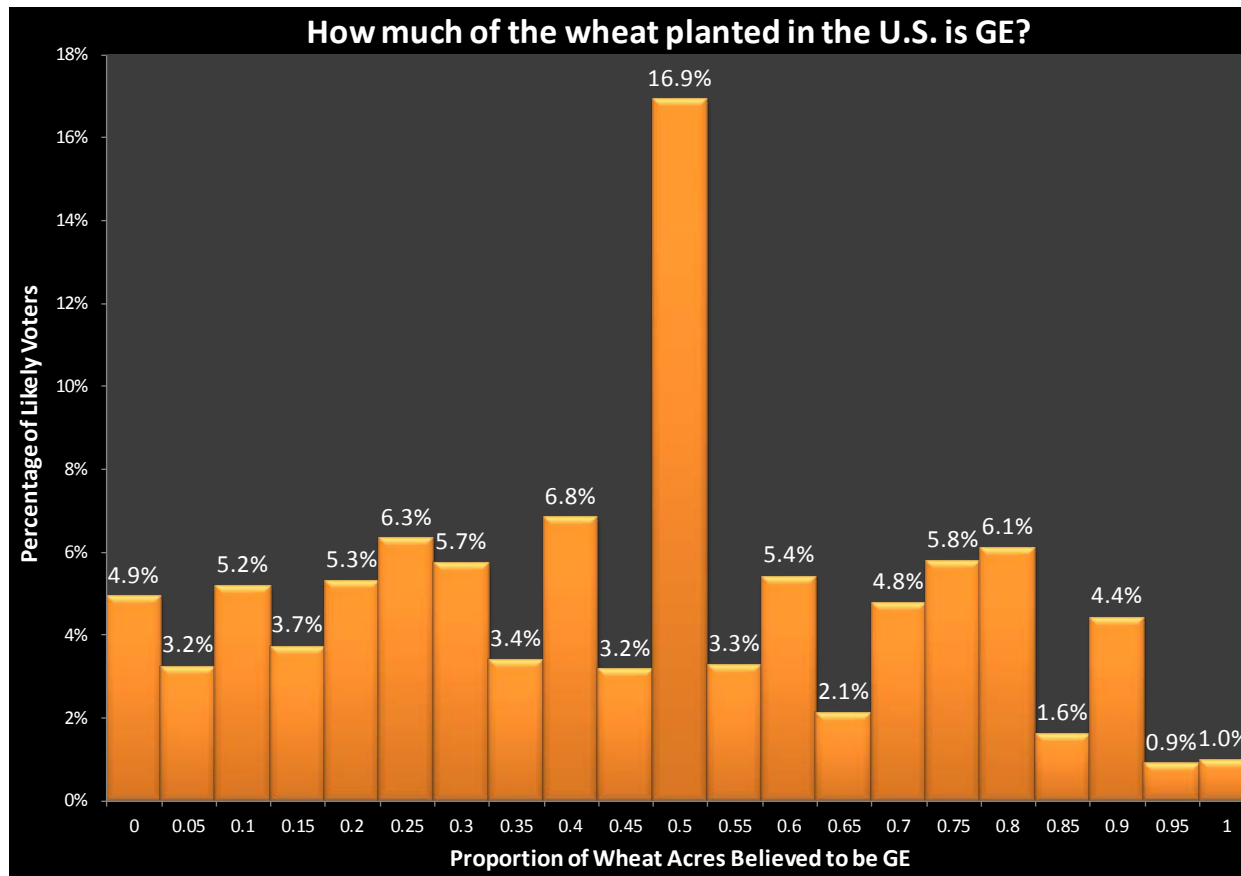
Low Knowledge

- California, Oct 2012



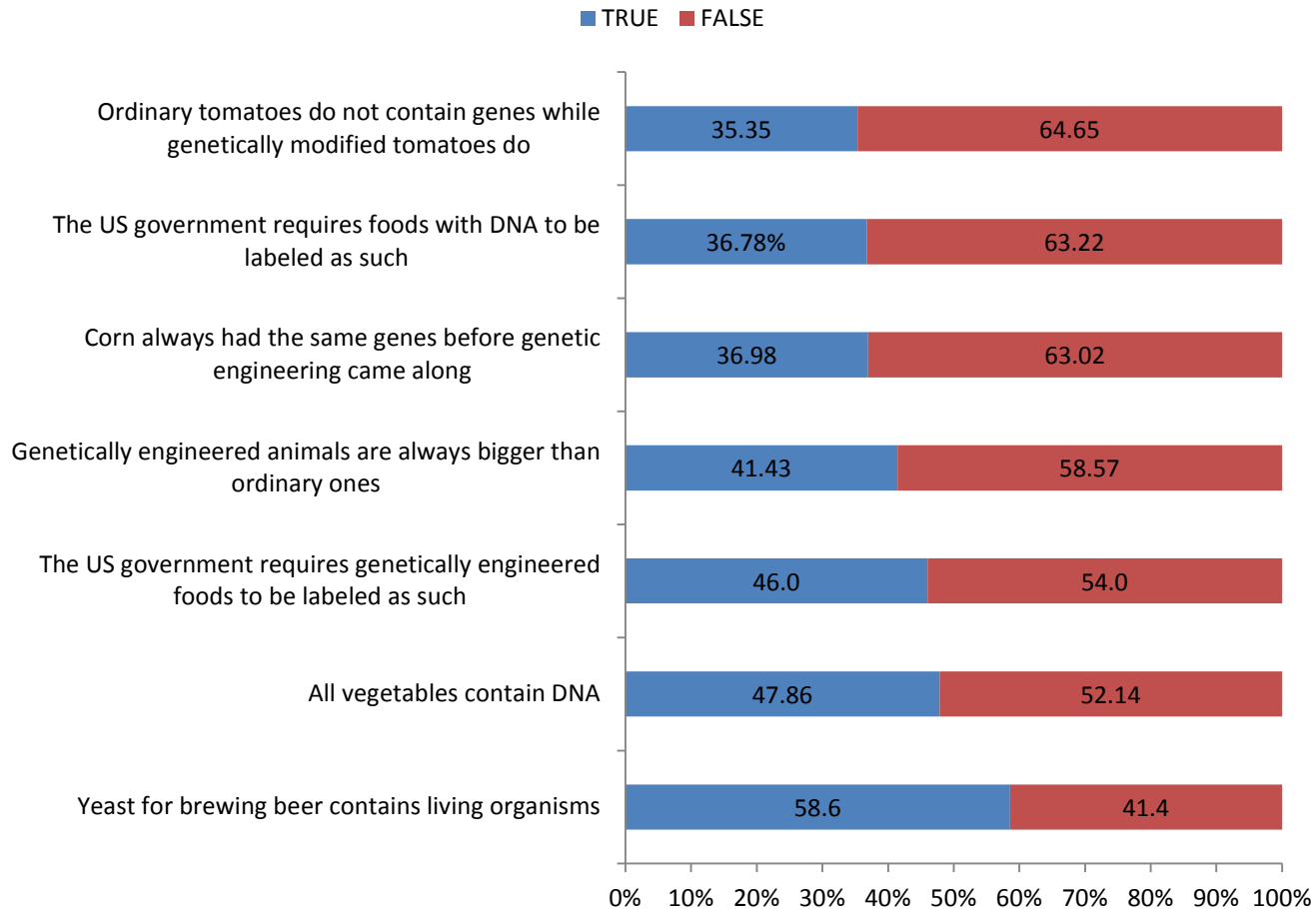
Low Knowledge

- California, Oct 2012



Low Knowledge

- **FoodS (Feb 2015)**



Low knowledge

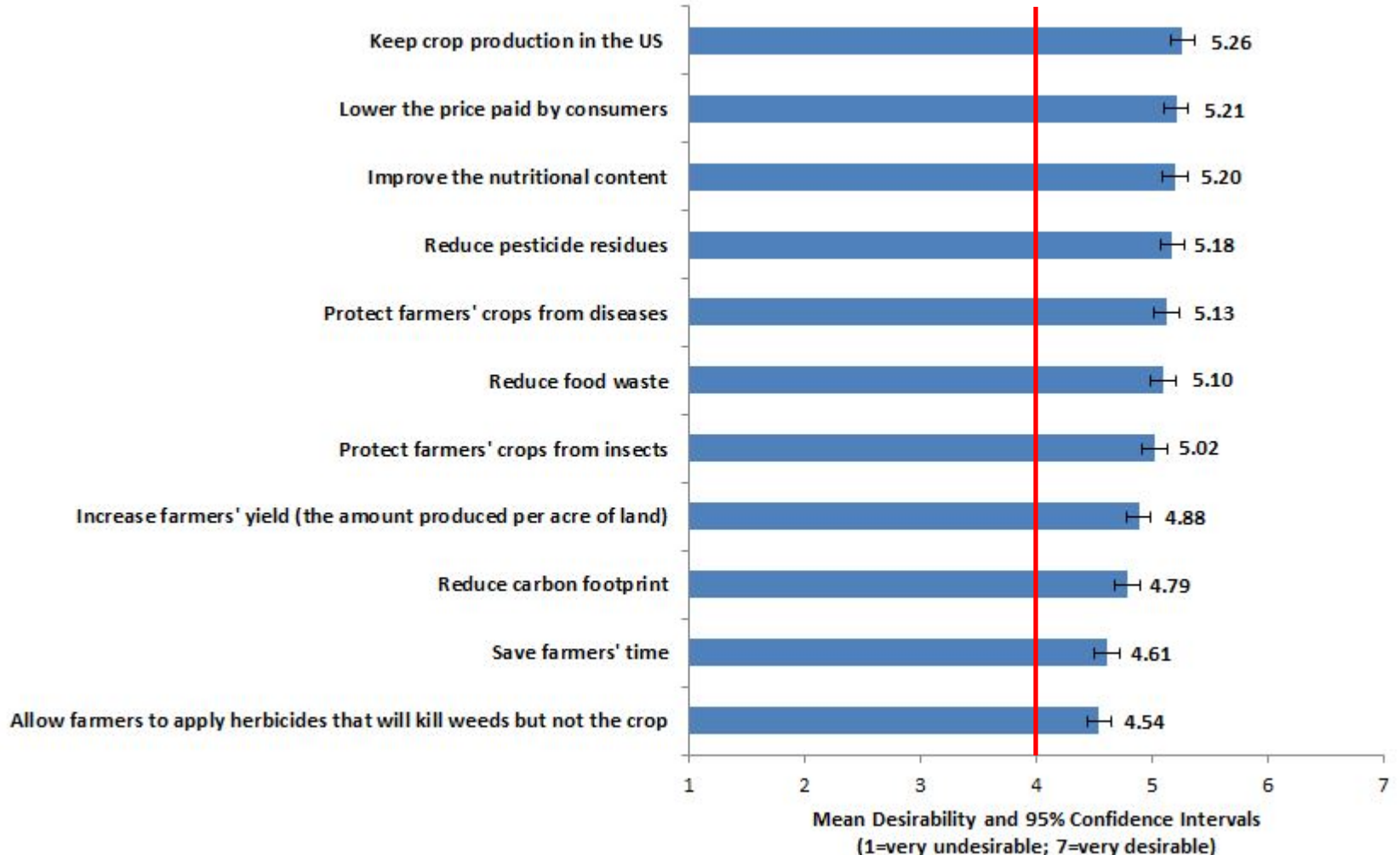
- **FoodDs (July 2015)**



Information Matters

Info on reason for GM

How desirable is a food or crop genetically engineered to . . .



Effect of Information on Labels

Control N=213

Which of the following apples would you choose?

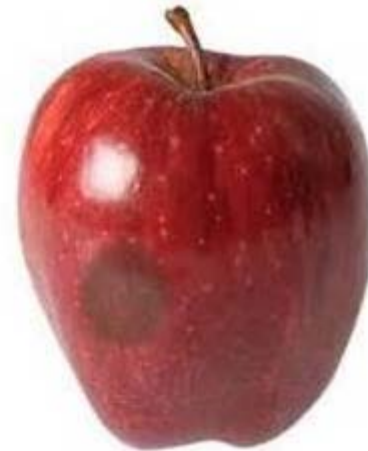
Option A



Ripened with ethylene
\$1.40/lb



Option B



\$2.80/lb



Attributes

Color: green vs. red

Blemish: yes vs. no

Price: \$1.40 vs. \$2.80

Label: Ripened with Ethylene vs. blank

8 choice questions

Treatment 1 (N=217)

Mandatory GMO Labeling (negative labeling)

Which of the following apples would you choose?

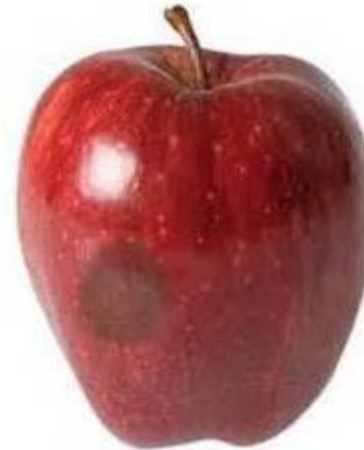
Option A



Genetically engineered
\$1.40/lb



Option B



\$2.80/lb



Attributes

Color: green vs. red

Blemish: yes vs. no

Price: \$1.40 vs. \$2.80

Label: Genetically engineered vs. blank

8 choice questions

Treatment 2 (N=217)

Voluntary GMO Labeling (positive labeling)

Which of the following apples would you choose?

Option A

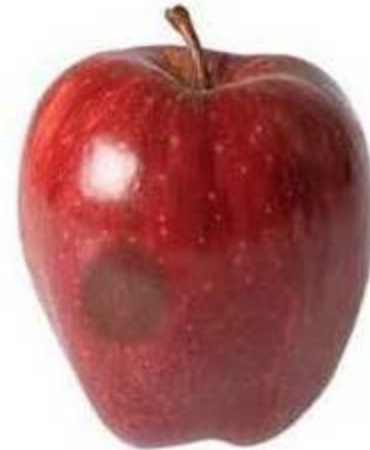


Not genetically engineered

\$1.40/lb



Option B



\$2.80/lb



Attributes

Color: green vs. red

Blemish: yes vs. no

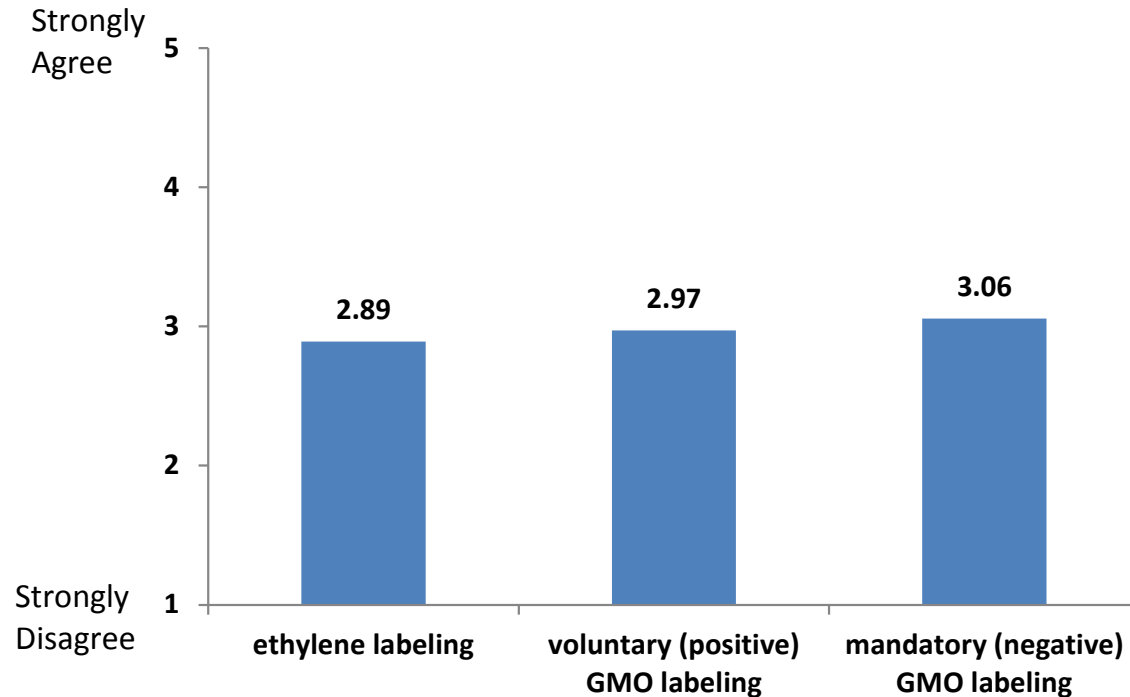
Price: \$1.40 vs. \$2.80

Label: Not genetically engineered vs. blank

8 choice questions

Labels didn't affect beliefs

- “Genetically engineered foods are safe to eat”



ANOVA p-value = 0.30

Wilcoxon Rank sum p-value = 0.30

WTP by Info on Label

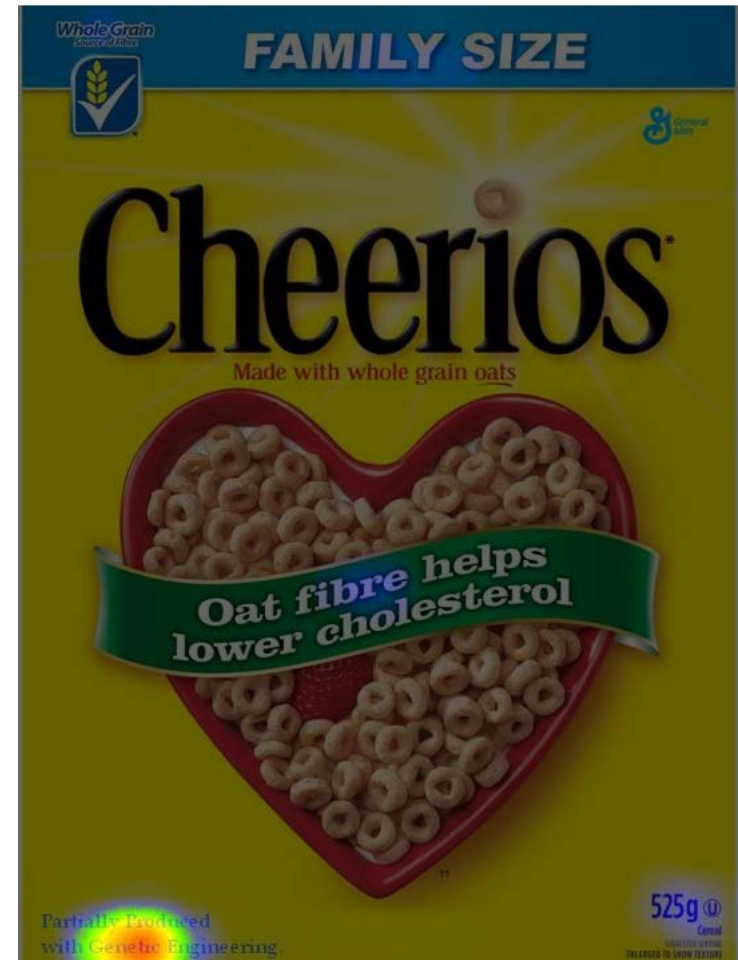
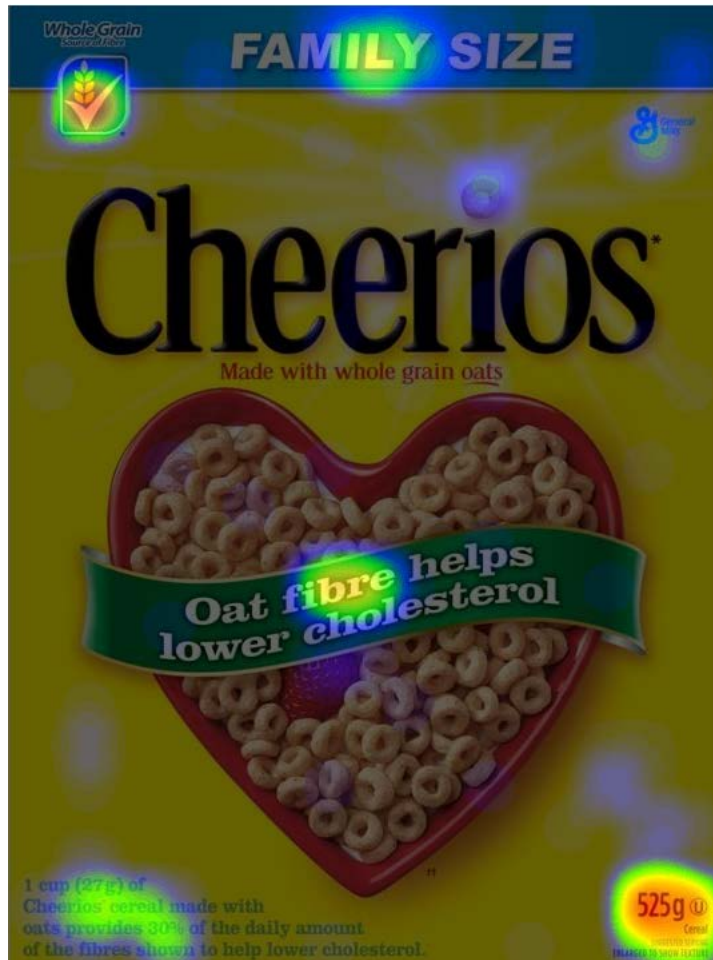
WTP for . . .	mandatory (negative) GMO labeling	voluntary (positive) GMO labeling	ethylene labeling
No Damage vs. Damage	\$1.61	\$1.60	\$2.15
Red vs. Greed	\$0.41	\$0.32	\$0.45
Genetically engineered vs. unlabeled	-\$1.98		
Not genetically engineered v. unlabeled		\$0.81	
Ripened with ethylene vs. unlabeled			-\$1.91

- **Implied WTP for non-GM vs. GM is 144% higher when framed in a negative (mandatory) vs. positive (voluntary) way**
 - **Differential labels signal something different about the relative desirability of the unlabeled product**

Least Appealing Area

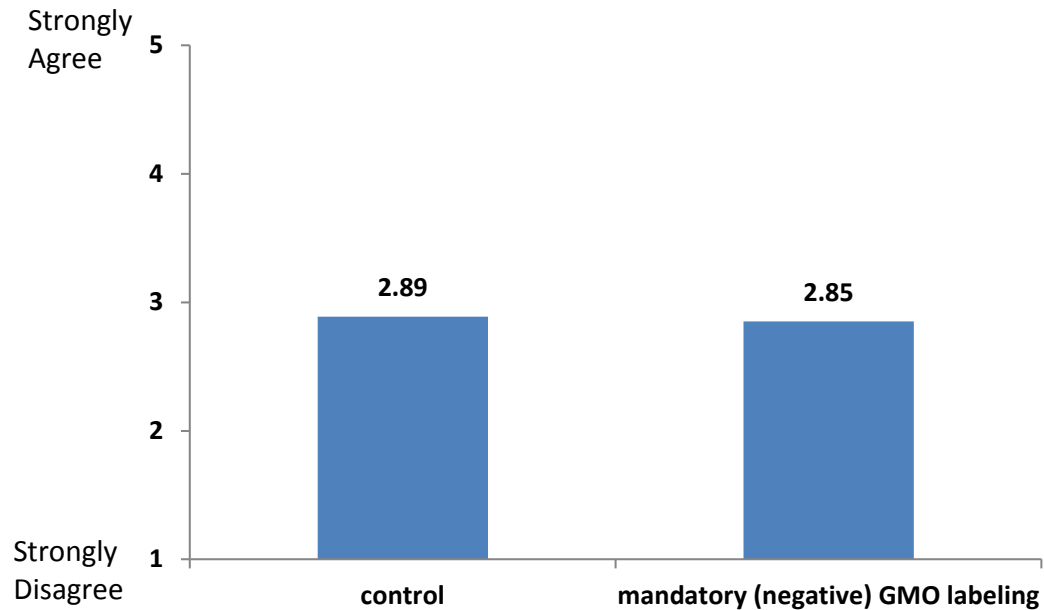
Control

Treatment



Results – Study 2

- “Genetically engineered foods are safe to eat”

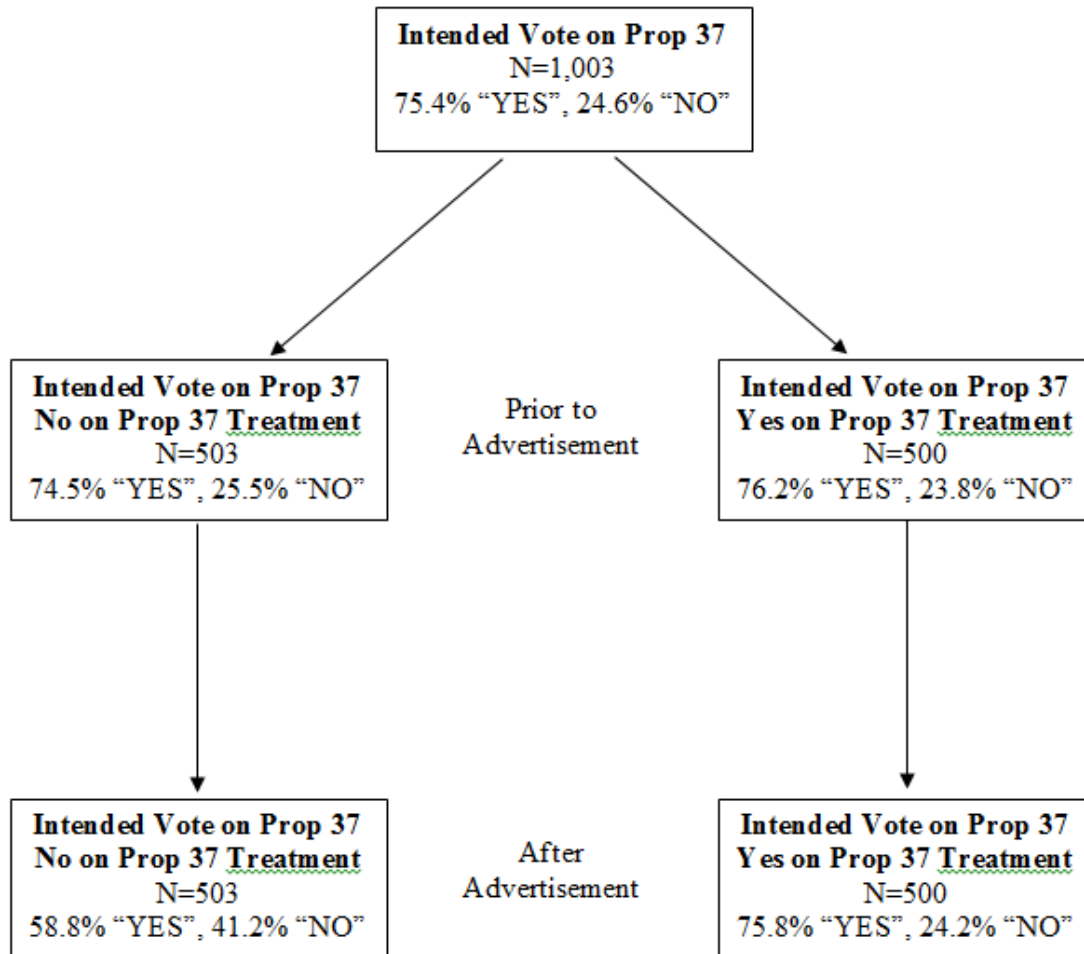


ANOVA p-value = 0.73

Wilcoxon Rank sum p-value = 0.60

Info from voting ads

- “NO” ads were more effective than “YES”



Response to Scientific Information

Label	Description	Percent
<i>Believers</i>	Participants who believe GM foods are safe to eat	31.9%
<i>Deniers</i>	Participants who deny GM foods are safe to eat	36.6%
<i>Neutrals</i>	Participants who neither believe nor deny GM foods are safe to eat	31.5%

Scientific Information

Genetically Modified Crops/Food Information Sheet

The following are statements and information on genetically modified crops from the American Association for the Advancement of Science, American Medical Association, Food and Agriculture Organization of the U.N., and National Research Council.

"Foods containing ingredients from genetically modified (GM) crops pose no greater risk than the same foods made from crops modified by conventional plant breeding techniques."

- American Association for the Advancement of Science

"To date, no evidence has supported an increased degree of allergenicity of bioengineered foods compared to their non-bioengineered counterparts. This is due in part to the safety assessments to which bioengineered foods are subjected prior to marketing."

-American Medical Association

"It could lead to higher yields on marginal lands in countries that today cannot grow enough food to feed their people."

-Food and Agriculture Organization of the U.N.

"To date, no adverse health effects attributed to genetic engineering have been documented in the human population."

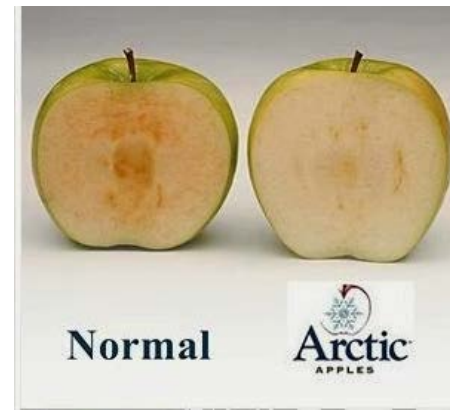
-National Research Council (National Academies of the United States)

Response to Scientific Information

Label	Description	Percent
<i>Conservative</i>	Participants whose beliefs about safety of GM was unchanged after scientific information.	43.4%
<i>Convergent</i>	Participants whose beliefs about safety of GM converged to scientific information.	44.4%
<i>Divergent</i>	Participants whose beliefs about safety of GM foods diverged from scientific information.	12.2%

Conclusions

- **Summary**
 - **cost implications of mandatory labels are highly uncertain**
 - **“gut” reactions to GMOs are slightly negative (labeling very positive)**
 - **consumers still largely unknowledgeable, persuadable**
 - **New GMO applications may be most influential in affecting public perception**

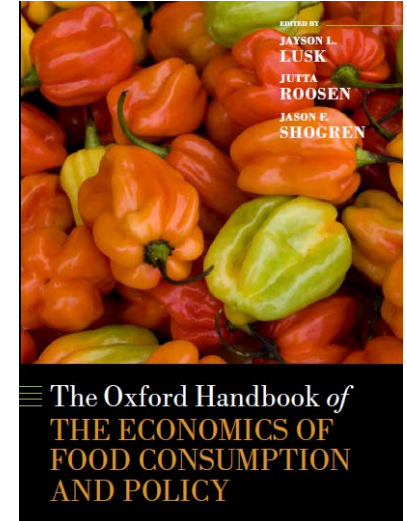
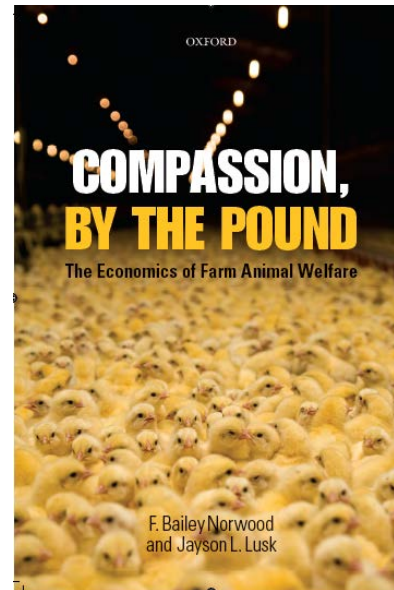
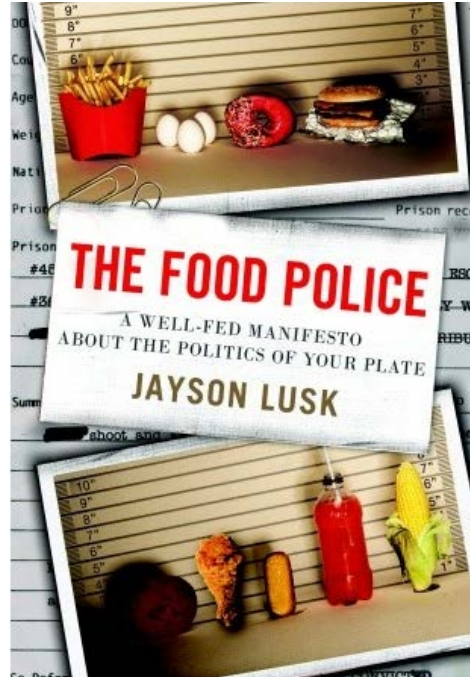


HOW SCIENCE AND TECHNOLOGY
ARE SERVING UP SUPER FOODS
TO SAVE THE WORLD



Unnaturally Delicious

JAYSON LUSK



Contact:

jayson.lusk@okstate.edu

405-744-7465

www.jaysonlusk.com

@JaysonLusk