



## OPINION REPORT: PUBLIC OPINION & BIOTECHNOLOGY

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In this report we provide a systematic review of trends in public opinion about biotechnology and genetically modified (GM) foods in the United States. We collect and review nearly three decades of publicly available poll information covering topics including: 1) perceived availability of genetically modified foods, 2) exposure to information related to biotechnology and genetically modified foods, 3) support for use of biotechnology in agriculture, 4) risk/benefit perceptions, 5) willingness to eat genetically modified foods, and 6) presence of biotechnology or genetic modification as a top-of-mind concern related to food safety.

### **GMOs and the Cultivation of Food in the United States**

Over 150 genetically modified or engineered crops and 12 plant proteins have been reviewed by the United States Food and Drug Administration (FDA) since 1994 (FDA, 2013a, 2013b). Although the majority of reviews concern modifications to increase plant virus resistance or tolerance to insecticide and herbicides, the FDA has also reviewed changes to plant genetics that modify their composition, growth, or ripening (FDA, 2013a). The widespread adoption of genetically modified crops has resulted in industry estimates that between 70 and 80 percent of food available in U.S. supermarkets contains genetically modified or bioengineered components (Grocery Manufacturer's Association, 2014).

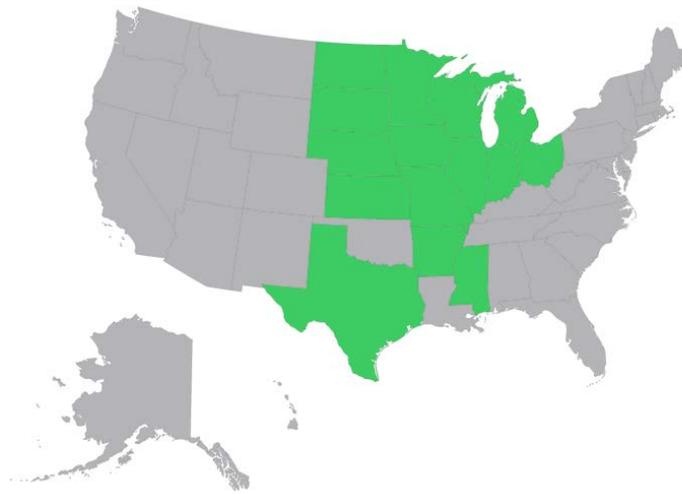
Corn and soybeans are the most widely planted GM crops in the US, and it is difficult to overstate their importance in modern farming. Roughly half the nation's land mass, or 913 million acres, is used as farmland. About 45% of farm acres, or 408 million, are cultivated in crops, of which 80 million were planted in corn and 77.5 million were planted in soy in 2014. Although 93% of corn and 94% of soy planted in the U.S. are grown from genetically modified seeds, one is most likely to encounter a field of GM soy or corn in the Upper Midwest, Great Lakes, and Great Plains states, extending south to Texas and Arkansas for corn and Mississippi for soy. In total, roughly 38% of land

under cultivation, or about 17% of total land, in the U.S. is planted with either corn or soy (Figure 1) (Fernandez-Cornejo, 2013). Of course, the total cash value of these two crops varies according to acres planted, yield, and market price per bushel, but in 2014 U.S. farms produced \$52 billion of corn and \$40 billion of soybeans, down from a 2012 high of \$74 billion and \$43 billion, respectively (Fernandez-Cornejo, 2014; Honig, 2015).

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**Figure 1:** Adoption of genetically modified corn and soy by state in 2014

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State	GM Corn % Acres	GM Soy % Acres	State	GM Corn % Acres	GM Soy % Acres
Arkansas	—	99	Nebraska	96	95
Illinois	91	91	North Dakota	96	96
Indiana	88	92	Ohio	86	90
Iowa	95	97	South Dakota	97	97
Kansas	95	94	Texas	91	—
Michigan	93	91	Wisconsin	92	95
Minnesota	93	94	Other states	91	94
Mississippi	—	99	All states	93	94
Missouri	93	91			

*Note: “—” indicates no data available.*

Source: Fernandez-Cornejo, J. (2014). Recent trends in GE adoption: Adoption of genetically engineered crops in the U.S. Retrieved June 5, 2014, from

<http://www.ers.usda.gov/data-products/adoption-of-genetically-engineered-crops-in-the-us.aspx>

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### **Public Opinion & Food-Related Biotechnology**

Public opinion researchers have been tracking sentiment toward GM foods since their introduction. An early trend report noted that GM-related media coverage and public sentiment were largely optimistic with benefits outweighing risks through the 1980s. In the early 1990s, news coverage shifted toward a focus on potential negative consequences and public opinion followed suit as science, politics, and media coverage became entangled, confusing the public as it attempted to understand the facts related to the use of biotechnology (Shanahan, Scheufele, & Lee, 2001; Specter, 2000).

### **Public Perception About Availability of Genetically Modified Food**

Measures of awareness of the extent to which genetically modified food or foods produced through biotechnology are present in grocery stores are mixed, and likely dependent on question wording. When asked to estimate the percent of genetically modified food in grocery stores in 2001, 60% of respondents said less than 50%. Phrased differently, 52% of 2012 respondents and 48% of 2013 respondents answered "most" or "a lot" of processed foods in grocery stores were genetically modified, with fewer answering the same for fruits and vegetables in those years (Table 1).

<b>Table 1. MELLMAN/NYT: How much food in a typical American grocery store is genetically modified?</b>						
	Mellman <sup>a</sup>		NYT <sup>b</sup>	NYT <sup>b</sup>	NYT <sup>b</sup>	NYT <sup>b</sup>
	1/01		6/12	1/13	6/12	1/13
	Food		Processed Foods	Processed Foods	Fruits/Veg	Fruits/Veg
	%		%	%	%	%
More than 75 percent	4	Most	31	30	21	23
Between 50 and 75 percent	10	A lot	21	18	21	17
Between 25 and 50 percent	22	Some	27	32	31	37
Less than 25 percent	38	Very little	11	10	13	14
None	—	None	4	3	5	4
Don't know	25	Don't know	7	7	9	6
<i>N</i>	1,001*	<i>N</i>	990*	1,052	990	1,052*
<sup>a</sup> MELLMAN: To the best of your knowledge, how much of the food in a typical American grocery store is genetically modified (that is, food modified through biotechnology) or contains genetically modified ingredients? <i>Less than 25 percent, between 25% and 50%, between 50% and 75%, more than 75%, or don't know</i>						
<sup>b</sup> NYT: (Scientists can change the genes in some food crops and farm animals to make them grow faster or bigger and be more resistant to bugs, weeds, drought and disease. Food from this process is called genetically modified, or genetically engineered.) Thinking about the (processed foods/fruits/vegetables) you purchase at the grocery store... how many do you think contain some form of genetically modified or genetically engineered ingredients? <i>Is it--most, a lot, some, very little, or none?</i>						
<i>Note: "—" indicates no data available</i>						
<i>*Percentages do not total to 100 due to rounding conventions</i>						

Asked in a broader way as "are there foods produced through biotechnology in the supermarket now?" 23% of 2007 respondents said "yes," growing to 28% in 2010, 30% in 2012, and 37% in 2014 (Table 2). When asked to name which foods, vegetables were volunteered most often, followed by fruits and corn/corn products (Table 2).

<b>Table 2. COGENT/MSI: As far as you know, are there any foods produced through biotechnology in the supermarket now?</b>				
	Cogent <sup>a</sup>	Cogent <sup>a</sup>	Cogent <sup>a</sup>	MSI <sup>b</sup>
	7/07	4/10	3/12	3/14-4/14
	%	%	%	%
Yes	23	28	30	37
No	9	8	11	5
Don't Know	68	64	59	58
<i>N</i>	1,000	1,024	750	1,000
[If yes] Which foods would those be?				
	%	%	%	%
Vegetables	42	37	31	68
Fruits	33	19	24	62
Corn/Corn Products	19	21	19	69
Meats/Eggs/Fish	17	14	18	—
Tomatoes	14	10	10	—
Cereals/Grains	8	4	13	57
Milk/Dairy	8	4	6	48
Soy	3	4	4	50
Processed Foods	2	<1	11	2
Potatoes	1	1	1	—
Other	5	7	9	5
Nothing	—	—	3	—
Meat	—	—	—	51
Eggs	—	—	—	41
Fish	—	—	—	33
<i>N</i>	1,000	750	750	1,000
Note: “—” indicates no data available				
<sup>a</sup> [If yes] Which foods would those be ( <i>Open ended</i> )				
<sup>b</sup> [If yes] Select all that apply				

### The Public & Information About Biotechnology and Genetically Modified Foods

A series of poll questions from 1997 to 2014 show that, despite widespread adoption by agricultural producers and food manufacturers, over half of respondents in each year reported reading or hearing only "a little" or "nothing at all" about biotechnology used to develop food and medicine (Table 3).

<b>Table 3.</b> WIRTHLIN/COGENT/MSI: As you may know, some food products and medicines are being developed with the help of new scientific techniques. The general area is called “biotechnology” and includes tools such as genetic engineering. Biotechnology is also being used to improve crop plants. How much have you heard or read about biotechnology? <i>Would you say you have read or heard: a lot, some, a little or nothing at all?</i>									
	Wirthlin	Wirthlin	Wirthlin	Wirthlin	Wirthlin	Cogent	Cogent	Cogent	MSI
	3/97	2/99	10/99	5/00	1/01	7/07	4/10	3/12	3/14-4/14
	%	%	%	%	%	%	%	%	%
A lot	11	7	13	14	15	7	7	10	11
Some	35	26	24	31	32	30	27	32	31
A little	32	36	36	34	31	36	35	32	29
Nothing at all	21	31	27	21	22	27	31	26	29
No Opinion	—	—	—	—	—	—	—	—	—
N	1,000*	1,000	1,000	1,000	1,000	1,000	750	750	1,000
<i>Note: “—” indicates no data available</i>									
<i>*Percentages do not total to 100 due to rounding conventions</i>									

During that time period, the number of respondents who had heard or read "a great deal" or "some" about biotechnology declined from 50% in 1999 to 41% in 2013 (Table 4), and those who followed the news about biotechnology "very closely" or "somewhat closely" declined from 45% to 40% (Table 5). In 2013, Gallup asked as a one-time question "From what you know or have heard, do you believe that foods that have been produced using biotechnology pose a serious health hazard to consumers, or not?" to which 48% of respondents replied "yes," 36% responded "no," and 16% responded "no opinion."

<b>Table 4.</b> GALLUP: As you may know, some food products and medicines are being developed using new scientific techniques. The general area is called 'biotechnology' and includes tools such as genetic engineering and genetic modification of food. How much have you heard or read about this issue? <i>A great deal, some, not much, or nothing at all</i>					
	9/99	3/00-4/00	7/01	7/03	7/13
	%	%	%	%	%
A great deal	10	14	16	9	12
Some	40	37	43	32	28
Not much	32	30	26	34	28
Nothing at all	18	19	14	25	30
No Opinion	—	—	1	—	—
<i>N</i>	1,039	998	1,038	1,006	2,027*
<i>Note: "—" indicates no data available</i>					
<i>*Percentages do not total to 100 due to rounding conventions</i>					

**Table 5.** GALLUP: As you may know, some food products and medicines are being developed with the help of new scientific techniques. The general area is called 'biotechnology' and includes tools such as genetic engineering and genetic modification of food. How closely have you been following the news about this issue?  
*Very closely, somewhat closely, not too closely or not at all*

	7/01	7/05
	%	%
Very closely	11	9
Somewhat closely	34	31
Not too closely	33	35
Not at all	21	25
No Opinion	1	—
<i>N</i>	1,038	1,006

*Note: “—” indicates no data available*

### Support for Biotechnology in Agricultural Food Production

Support for the biotechnology use in agricultural food production moved between 45% and 52% from 1999 to 2005 without a clear trend toward increasing or decreasing support (Table 6).

**Table 6.** GALLUP/HARRIS: Overall would you say you strongly support, moderately support, moderately oppose, or strongly oppose the use of biotechnology in agriculture and food production?

	Gallup	Gallup	Gallup	Harris	Gallup
	9/99	3/00-4/00	7/01	6/02	7/05
	%	%	%	%	%
Strongly support	9	12	9	14	9
Moderately support	42	36	43	34	36
Moderately oppose	25	23	24	20	29
Strongly oppose	16	18	14	25	16
No opinion	8	11	10	7	10
<i>N</i>	1,029	998	1,038*	3,262	1,006

*\*Percentages do not total to 100 due to rounding conventions*

### Perceptions of Risk Related to Biotechnology & Genetically Modified Foods

Despite middling levels of knowledge or information seeking among respondents, and some consistent support for the technology, concerns about food-related biotechnology have grown since

their introduction. The number of respondents who believed food produced using biotechnology poses a serious health hazard grew at a steady pace of 1% per year from 27% in 1999 to 33% in 2005, and then accelerated to 48% in 2013 (Table 7).

<b>Table 7. GALLUP: From what you know or have heard, do you believe that foods that have been produced using biotechnology pose a serious health hazard to consumers, or not?</b>					
	9/99	3/00-4/00	7/01	7/05	7/13
	%	%	%	%	%
Yes	27	30	30	33	48
No	53	51	53	54	36
No Opinion	20	19	17	13	16
N	1,039	998	1,038*	1,006	2,027
<i>*Asked of half sample</i>					

Questions about genetically modified foods are phrased in different manners by polling organizations. Variations include "[Is genetically modified food] one of the things that worries you most about food safety?" (Mellman), "How concerned are you... that eating genetically modified food sold at stores may harm members of your family?" (Tarrance), or "How concerned are you about genetically modified or genetically engineered food?" (NYT). If we consider that each of these questions attempts to gauge public concern about the negative consequences of GM food, then we can see an increase in those who were "very concerned/worrie[d] a great deal" or "somewhat concerned/worrie[d] some" from 61% or 64% in 2001, depending on survey, to 75% in 2013, and a decline in those "not at all concerned" from 16% or 19% in 2001, again depending on the survey, to 10% and 7% in 2012 and 2013, respectively (Table 8).

<b>Table 8. MELLMAN/TARRANCE/NYT: How concerned are you about genetically modified foods?</b>				
	Mellman <sup>a</sup>	Tarrance <sup>b</sup>	NYT <sup>c</sup>	NYT <sup>c</sup>
	1/01	6/01	6/12	1/13
	%	%	%	%
Very concerned/A great deal	34	37	39	37
Somewhat concerned/Some	27	27	34	38
Not too concerned/Not too much	13	15	15	17
Not at all concerned/Not at all	16	19	10	7
Don't Know	11	2	1	1
<i>N</i>	1,001*	1,024	990*	1,052
<sup>a</sup> MELLMAN: I'm going to list some things people tell us they are concerned about when it comes to food safety. After each, please tell me whether it is one of the things that worries you most about food safety, whether it worries you a great deal, some, not too much, or not at all. If you are not sure, please say so and we'll go on. <i>Genetically modified food</i> <sup>b</sup> TARRANCE: <i>Please tell me if you are very concerned, somewhat concerned, not too concerned, or not concerned at all:</i> How concerned are you that eating genetically modified food sold at stores may harm members of your family? <sup>c</sup> NYT: (Scientists can change the genes in some food crops and farm animals to make them grow faster or bigger and be more resistant to bugs, weeds, drought and disease. Food from this process is called genetically modified, or genetically engineered.) How concerned are you about genetically modified or genetically engineered food? <i>Very concerned, somewhat concerned, not too concerned or not at all concerned</i>				
*Percentages do not total to 100 due to rounding conventions				

Cancer, allergies or health problems were cited as the primary GM food-related concerns in 2012 and 2013 polls, followed by concerns over safety/toxicity and environmental problems (Table 9).

<b>Table 9.</b> NYT: (Scientists can change the genes in some food crops and farm animals to make them grow faster or bigger and be more resistant to bugs, weeds, drought and disease. Food from this process is called genetically modified, or genetically engineered.) What concerns you the most about genetically modified or genetically engineered food?		
	6/12	1/13
	%	%
Cause cancer or allergies/health problems	31	37
Not safe to eat/toxic	29	26
Environmental problems	9	13
Ethical concerns	7	4
Not tested	5	9
Bad taste	2	1
Nothing	1	—
Does not yield more	—	1
Proper labeling is needed	—	1
Don't know/No answer	9	5
Other	8	2
<i>N</i>	990*	1,052*
<i>Note: “—” indicates no data available</i>		
<i>*Percentages do not total to 100 due to rounding conventions</i>		

The level of concern appears to be much smaller when respondents are required to volunteer biotechnology or genetic modification as a concern. When respondents who are avoiding certain foods or ingredients were asked to list their specific food-related concerns in polls from 2007 through 2014, biotechnology was not volunteered until 2014, and then only by 2% of respondents. Instead, concerns over sugar, carbohydrates, and fats/oils/cholesterol were much more prominent (Table 10).

<b>Table 10.</b> COGENT/MSI: Thinking about your diet over the past few months, are there any foods or ingredients that you have eaten less of?				
	Cogent	Cogent	Cogent	MSI
	7/07	4/10	3/12	3/14-4/14
	%	%	%	%
Yes	61	54	53	53
No	39	46	47	47
If yes, what food or ingredients have you avoided? ( <i>Open ended</i> )*				
Sugar/carbs	54	51	52	55
Sugar	—	—	43	45
Carbs	—	—	29	37
Fats/oils/cholesterol	38	32	26	26
Animal products	21	18	22	25
Salt/sodium	15	20	17	18
Snack foods/fast food/soda	14	16	17	20
Artificial/additives	4	8	3	6
Processed/refined foods	2	1	4	2
Spices	2	2	2	—
Biotechnology	0	0	0	2
Other	11	14	12	—
Don't know/refused	—	—	3	—
<i>N</i>	1,000	750	750	1,000
<i>Note: "—" indicates no data available</i>				
<i>*Percent of those who answered "yes"; numbers do not total to 100 as respondents were allowed more than one answer.</i>				

### Perceptions of Benefits Related to Biotechnology & Genetically Modified Foods

Public opinion is complex, and both biotechnology and genetic modification of foods are not necessarily universally viewed as harmful, though negative views tend to be reported more often in media. For example, when asked if biotechnology would provide benefits, more answered "yes" than "no" in 2007 (33% vs. 13%), 2010 (32% vs. 16%), and 2012 (35% vs. 20%), although the most frequent response was "don't know" in each year the questions were asked (Table 11). Among those who answered "yes," nutrition/health, followed by improved quality/taste and price/economic were the benefits that respondent most expected (Table 11).

<b>Table 11. COGENT: Do you feel that biotechnology will provide benefits for you or your family within the next five years?</b>			
	7/07	4/10	3/12
	%	%	%
Yes	33	32	35
No	13	16	20
Don't Know	54	52	45
<i>N</i>	1,000	750	750
<b>[If yes] What benefits do you expect? (<i>Open ended</i>)*</b>			
	7/07	4/10	3/12
	%	%	%
Nutrition/health benefits	42	32	35
Improved quality/taste/variety	21	24	22
Price/economic benefits	20	24	21
Improved crops/agricultural production	18	21	13
Safer foods	15	10	11
Reduced pesticides/chemicals	7	3	3
Medical advances	1	1	13
Other	4	10	3
Don't know	6	3	2
Nothing	1	6	2
<i>*Percent of those who answered "yes"; numbers do not total to 100 as respondents were allowed more than one answer.</i>			

If prompted to consider the benefits, respondents have been considerably more open to biotechnology. When asked their overall impression of genetic engineering, where the technology was defined as "allows us to move beneficial traits from one animal to another in a precise way," 35% of respondents in 2007, 41% in 2010, and 44% in 2012 viewed the technology as "very favorable" or "somewhat favorable" (Table 12).

**Table 12.** COGENT: Genetic engineering is a form of animal biotechnology that allows us to move beneficial traits from one animal to another in a precise way. Would you say your overall impression of genetic engineering in animals is? *Very favorable, somewhat favorable, neither favorable nor unfavorable, not very favorable, or not at all favorable*

	7/07	4/10	3/12
	%	%	%
Very favorable	10	12	15
Somewhat favorable	25	29	29
Neither favorable n or unfavorable	35	30	33
Not very favorable	19	16	15
Not at all favorable	11	13	8
<i>N</i>	1,000	750	750

Questions framing plant-related biotechnology as beneficial also produced more favorable results.

In 1997, 55% said they were "very likely" or "somewhat likely" to buy produce modified by

biotechnology to taste better or fresher, rising to 69% in 2012 before declining to 58% in 2014 (Table 13).

**Table 13.** WIRTHLIN/COGENT/MSI: All things being equal, how likely would you be to buy a variety of produce, like tomatoes or potatoes, if it had been modified by biotechnology to taste better or fresher? *Very likely, somewhat likely, not too likely, not at all likely*

	Wirthlin	Wirthlin	Wirthlin	Cogent	Cogent	Cogent	MSI
	3/97	10/99	9/00	7/07	4/10	3/12	3/14-4/14
	%	%	%	%	%	%	%
Very likely	19	18	19	17	18	23	17
Somewhat likely	36	33	36	50	49	46	41
Not too likely	21	18	21	25	25	23	28
Not at all likely	22	25	22	8	8	8	14
Don't know/ Refused	2	6	2	—	—	—	—
<i>N</i>	1,000	1,000	1,000	1,000	750	750	1,000

*Note: "—" indicates no data available*

Although opinion fluctuated somewhat in the intervening years, 77% of respondents in 1997 and 69% of respondents in 2014 were "very likely" or "somewhat likely" to buy produce that had been modified by biotechnology to be protected from insect damage and require fewer pesticide applications (Table 14).

<b>Table 14. WIRTHLIN/COGENT/MSI: All things being equal, how likely would you be to buy a variety of produce, like tomatoes or potatoes, if it had been modified by biotechnology to be protected from insect damage and required fewer pesticide applications? <i>Very likely, somewhat likely, not too likely, not at all likely</i></b>							
	Wirthlin	Wirthlin	Wirthlin	Cogent	Cogent	Cogent	MSI
	3/97	10/99	5/00	7/07	4/10	3/12	3/14-4/14
	%	%	%	%	%	%	%
Very likely	39	28	30	28	29	30	29
Somewhat likely	38	39	39	53	48	47	40
Not too likely	11	11	14	14	17	17	20
Not at all likely	12	16	14	5	7	6	11
Don't know/ Refused	1	6	3	—	—	—	—
<i>N</i>	1,000*	1,000	1,000	1,000	750*	750	1,000
<i>Note: "—" indicates no data available</i>							
<i>*Percentages do not total to 100 due to rounding conventions</i>							

Similarly, there was a decline from 82% in 2007 to 72% in 2014 of those "very likely" or "somewhat likely" to buy foods modified by biotechnology to provide more healthful fats, like Omega-3 (Table 15).

**Table 15.** COGENT/MSI: All things being equal, how likely would you be to buy a food product made with oils that had been modified by biotechnology to provide more healthful fats, like Omega-3 in the food? *Very likely, somewhat likely, not too likely, not at all likely*

	Cogent	Cogent	Cogent	MSI
	7/07	4/10	3/12	3/14-4/14
	%	%	%	%
Very likely	33	31	28	27
Somewhat likely	49	45	43	45
Not too likely	14	18	22	19
Not at all likely	4	5	7	10
<i>N</i>	1,000	750*	750	1,000*
<i>*Percentages do not total to 100 due to rounding conventions</i>				

Regardless of other food-related biotechnology opinions, support for regulation requiring that genetically modified foods be labeled has been consistently strong, starting with 86% saying "yes" to requiring labels in 2000, growing to 93% in 2013 (Table 16).

**Table 16.** HARRIS/ABC/CBS/NYT/ NYT: Do you think the federal government should or should not require labels on food saying whether it has been genetically modified or bio-engineered?

	Harris <sup>a</sup>	ABC <sup>b</sup>	ABC <sup>b</sup>	CBS/NYT <sup>c</sup>	NYT <sup>c</sup>	NYT <sup>c</sup>
	6/00	6/01	7/03	4/08	6/12	1/13
	%	%	%	%	%	%
Yes	86	93	92	87	93	93
No	13	6	6	11	6	5
No Opinion/Not Sure	1	1	2	2	1	2
<i>N</i>	1,015	1,024	1,024	1,065	990	1,052

<sup>a</sup> HARRIS: Do you think the government should require the labeling of all packaged and other food products stating that they include corn, soy, or other products which have come from genetically modified crops, or is that not important? *Government should require, not important, not sure*

<sup>b</sup> ABC: Do you think the federal government should or should not require labels on food saying whether it has been genetically modified or bio-engineered? *Should, should not, no opinion*

<sup>c</sup> CBS/NYT: Do you think foods that contain genetically modified ingredients should be labeled indicating that or don't you think that is necessary? *Yes, should be labeled; No, not necessary; Don't know/No answer*

### Willingness to Eat Genetically Modified Foods

Willingness to eat genetically modified food was first asked in 1998, to which 58% of respondents said "no." A more specific version of the question was repeated in 2012 and 2013. When asked about willingness to eat genetically modified fish, 72% said "no" in 2012 and 73% in 2013 (Table 17). 66% were unwilling to eat genetically modified meat in 2012, 64% in 2013, and 78% in 2014 (Table 18).

<b>Table 17. YANKELOVICH/NYT: Would you eat genetically modified...?</b>			
	Food	Fish	Fish
	Yankelovich <sup>a</sup>	NYT <sup>b</sup>	NYT <sup>b</sup>
	12/98	6/12	1/13
	%	%	%
Yes	28	23	23
No	58	72	73
Don't know	14	5	4
<i>N</i>	1,031	990	1,052
<sup>a</sup> YANKELOVICH: If food was labeled as genetically-engineered, would you buy it for yourself or for your family to eat, or wouldn't you do so? <i>Yes, no, don't know</i> <sup>b</sup> NYT: (Which of the following foods would you eat, knowing that they had been genetically modified or genetically engineered?) What about vegetables, fruits, or grains? Would you eat genetically modified or genetically engineered ( <i>fish/meat/vegetables, fruits, or grains</i> ) or wouldn't you? <i>Yes, no, don't know</i>			

<b>Table 18. NYT/PSRA: Would you eat genetically modified...?</b>			
	Meat	Meat	Meat
	NYT <sup>b</sup>	NYT <sup>b</sup>	PSRA <sup>c</sup>
	6/12	1/13	2/14
	%	%	%
Yes	32	33	20
No	66	64	78
Don't know	3	3	2
<i>N</i>	990	1,052	1,001
<sup>a</sup> NYT: (Which of the following foods would you eat, knowing that they had been genetically modified or genetically engineered?) What about vegetables, fruits, or grains? Would you eat genetically modified or genetically engineered ( <i>fish/meat/vegetables, fruits, or grains</i> ) or wouldn't you? <i>Yes, no, don't know</i>			
<sup>b</sup> PSRA: Next, here are some things that people might be able to do in the next 50 years. For each, tell me if this were possible, would you personally do this. Would you eat meat that was grown in a lab? <i>Yes, no, don't know</i>			
*Percentages do not total to 100 due to rounding conventions			

Aversion to eating genetically modified fruits, vegetables, or grains was lower with 50% saying "no" to the prospect of eating genetically modified foods in 2012 and 47% in 2013 (Table 19). Consistent with these questions, using biotechnology in food production with plants (Table 20) is viewed more favorably than biotechnology with animals (Table 12).

<b>Table 19. YANKELOVICH/NYT: Would you eat genetically modified...?</b>			
	Food	Fruit/Veg Grains	Fruit/Veg Grains
	Yankelovich <sup>a</sup>	NYT <sup>b</sup>	NYT <sup>b</sup>
	12/98	6/12	1/13
	%	%	%
Yes	28	46	49
No	58	50	47
Don't know	14	4	4
<i>N</i>	1,031	990	1,052
<sup>a</sup> YANKELOVICH: If food was labeled as genetically-engineered, would you buy it for yourself or for your family to eat, or wouldn't you do so? <i>Yes, no, don't know</i> <sup>b</sup> NYT: (Which of the following foods would you eat, knowing that they had been genetically modified or genetically engineered?) What about vegetables, fruits, or grains? Would you eat genetically modified or genetically engineered ( <i>fish/meat/vegetables, fruits, or grains</i> ) or wouldn't you? <i>Yes, no, don't know</i>			

<b>Table 20. COGENT/MSI: What is your overall impression of using biotechnology with plants that produce food products? <i>Very favorable, somewhat favorable, neither favorable nor unfavorable, not very favorable, not at all favorable, or don't know enough about it to form an opinion</i></b>				
	Cogent	Cogent	Cogent	MSI
	7/07	4/10	3/12	3/14-4/14
	%	%	%	%
Very favorable	8	10	12	8
Somewhat favorable	25	22	26	20
Neither favorable nor unfavorable	30	29	26	30
Not very favorable	13	14	12	17
Not at all favorable	5	5	8	11
Don't know enough about it to form an opinion	19	20	17	13
<i>N</i>	1,000	750	750*	1,000*
*Percentages do not total to 100 due to rounding conventions				

**Table 21.** COGENT: What is your overall impression of using biotechnology with animals that produce food products such as meat, milk and eggs? *Very favorable, somewhat favorable, neither favorable nor unfavorable, not very favorable, not at all favorable, or don't know enough about it to form an opinion*

	7/07	4/10	3/12
	%	%	%
Very favorable	6	10	10
Somewhat favorable	18	19	23
Neither favorable n or unfavorable	26	24	25
Not very favorable	14	13	13
Not at all favorable	9	14	13
Don't know enough about it to form an opinion	27	20	16
<i>N</i>	1,000	750	750

### **Biotechnology & Genetically Modified Food as Top-of-Mind Concern**

Although respondents express concerns when asked directly about biotechnology or GM foods, the issue is cited less often when questions about threats to food safety are open ended. In polls from 1989 through 1994, around the time the first GM cultivars were approved, biotechnology or genetic modification do not appear among answers volunteered as threats to the safety of food respondents eat (Table 22).

<b>Table 22.</b> ORC: What, if anything, do you feel are the greatest threats to the safety of the food you eat? ( <i>Open ended</i> )						
	1/89	1/90	1/91	1/92- 2/92	1/93- 2/93	1/94- 1/94
	%	%	%	%	%	%
Spoilage/germs	36	29	16	15	18	10
Tampering	20	14	8	6	7	4
Improper packaging/canning	17	16	17	10	13	5
Pesticides/residues/insecticides/herbicides	16	19	20	18	13	14
Chemicals	11	16	15	13	8	12
Unsanitary handling - employees	10	11	10	6	10	3
Additives (non-specific)	7	6	6	5	4	5
Preservatives	7	8	7	6	6	7
Unsanitary handling - shoppers	6	4	3	8	4	3
Processing/preparation of foods	4	3	3	10	12	11
Bugs/pests/rats	3	3	2	2	2	1
Pollution/environmental pollution	3	4	3	3	2	3
Artificial coloring	2	3	1	1	1	2
Antibiotics	1	2	2	*	1	1
Radiation	1	1	1	1	*	*
Bacteria/contamination	*	*	3	9	8	10
Freshness/shelf life too long	*	*	6	12	20	16
Quality control/improper shipping, handling, etc.	*	*	5	9	9	12
None	2	6	3	3	3	3
Not sure	11	12	19	15	14	14
Other	6	10	4	7	6	6
<i>N</i>	1,031	1,005	1,004	2,000	2,006*	2,018
<i>*Asked of Form B half sample; Question is open ended and columns do not total to 100</i>						

Asked again in a series from 2007 through 2014, only a small number of respondents name biotechnology as a threat, 6% in 2007, declining to 2% in both 2012 and 2014 (Table 23)

<b>Table 23. COGENT: What, if anything, are you concerned about when it comes to food safety? (Open ended)*</b>			
	7/07	4/10	3/12
	%	%	%
Disease/Contamination	38	38	29
Handling/Preparation	26	33	21
Food source	20	11	7
Preservatives/Chemicals	9	10	13
Health/Nutrition	8	9	8
Agricultural production	8	9	7
Biotech	6	2	2
Packaging/Labeling	5	5	5
Other	4	—	1
Processed foods	1	1	1
<i>N</i>	1,000	750	750
<i>Note: “—” indicates no data available</i>			
<i>*Question is open ended and numbers do not total to 100</i>			

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## Appendix

### Polling Organizations Abbreviations

ABC News	ABC
CBS	CBS News
CBS News/New York Times Poll	CBS/NYT
Cogent Reports	Cogent
Gallup Organization	Gallup
Harris Interactive	Harris
Louis Harris & Associates	Harris
Marketing Strategies Internationals	MSI
Mellman Group/Public Opinion Strategies	Mellman
New York Times Poll	NYT
Opinion Research Corporation	ORC
Princeton Research Associates International	PSRA
The Tarrance Group	Tarrance
Wirthlin Group	Wirthlin
Yankelovich Partners	Yankelovich

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