

# “My thoughts on science communication”

Alison Van Eenennaam, Ph.D.

Cooperative Extension Specialist  
Animal Biotechnology and Genomics

Department of Animal Science  
University of California, Davis, USA

**UCDAVIS**  
**ANIMAL SCIENCE**

Email: [alvaneennaam@ucdavis.edu](mailto:alvaneennaam@ucdavis.edu)

Twitter: @BioBeef

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



FEWER MOLES

MORE MOLES



SCIENTISTS  
ARE BAD;  
ACTIVISTS  
ARE GOOD



EATING  
MEAT  
CAUSES  
GLOBAL  
WARMING



MEAT IS  
ALWAYS BAD  
FOR YOU



PINK  
SLIME



ANTIBIOTIC  
USE IN  
ANIMAL AG  
IS ALWAYS BAD



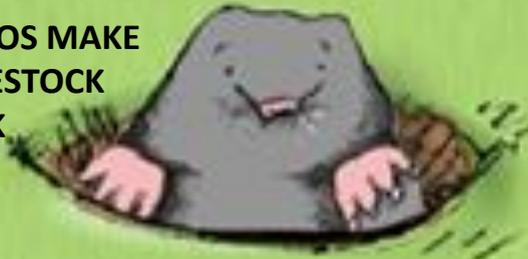
FARMERS  
MISTREAT  
ANIMALS



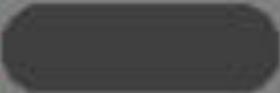
CONVENTIONAL  
AGRICULTURE  
DESTROYS THE  
ENVIRONMENT



GMOS MAKE  
LIVESTOCK  
SICK



GRASSFED IS  
BETTER



**My job often involves dealing with skeptical audiences – and need to contact with shared values**





# The problem is the public, not scientists or policymakers

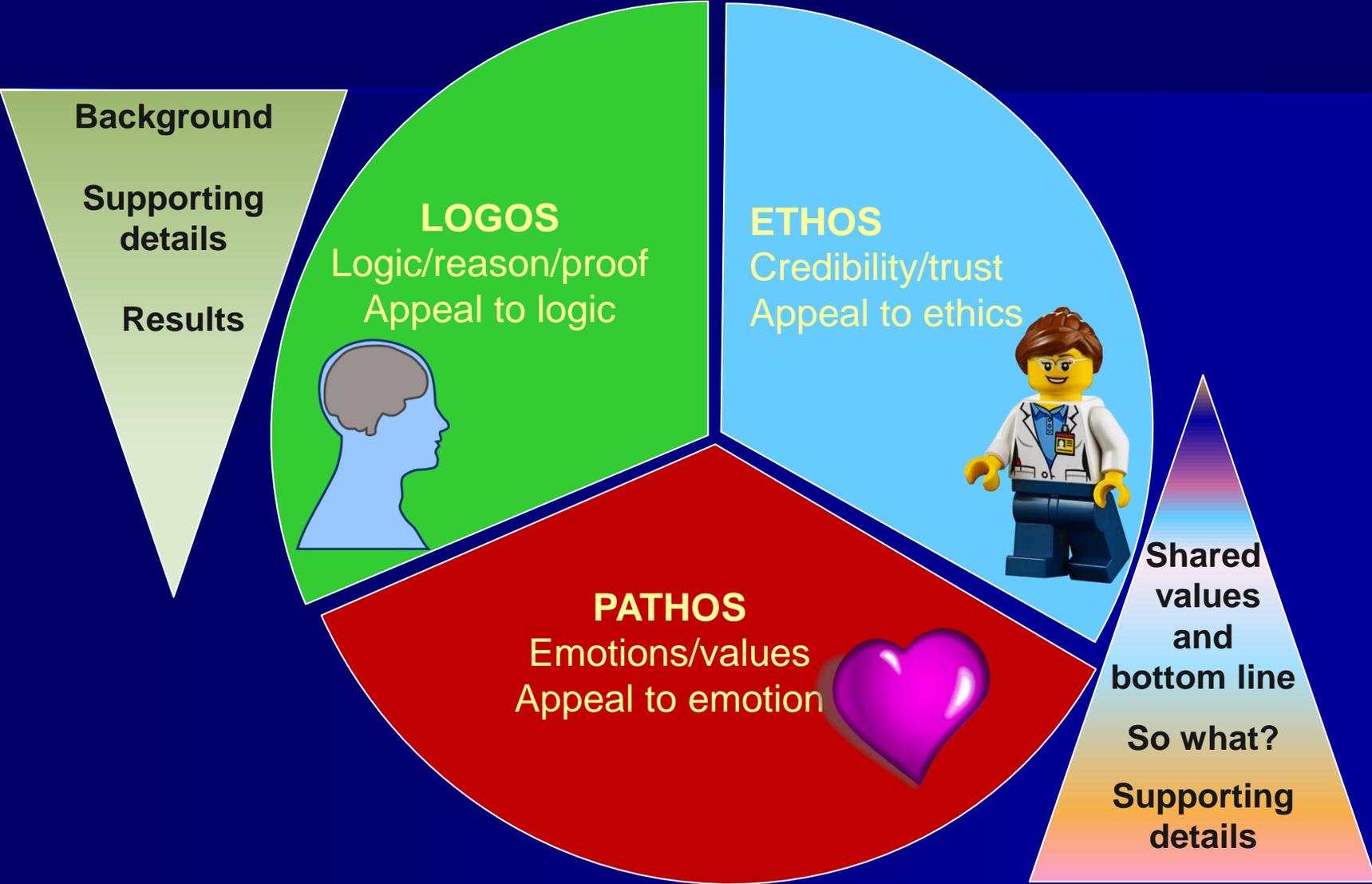
“Scientists have long believed that when the public disagreed with them on matters of policy, public ignorance was to blame..... But research shows that science literacy has only a limited connection to public attitudes. Instead, **trust, emotion, social identity, and how an issue is framed** matter more, putting much of the burden of effective communication on scientists and their institutions.”

Matthew C Nisbet and Dietram A Scheufele

<http://www.the-scientist.com/?articles.view/articleNo/32384/title/Opinion--Scientists--Intuitive-Failures/>



# Aristotle's Rhetorical Triangle - the available means of persuasion



# This is very effective



**LOGOS**

Logic/reason/proof

**ETHOS**

Credibility/trust

**PATHOS**  
Emotions/values



Main techniques  
Stories/Anecdotal information  
Inspirational quotes  
Vivid language  
Scare tactics

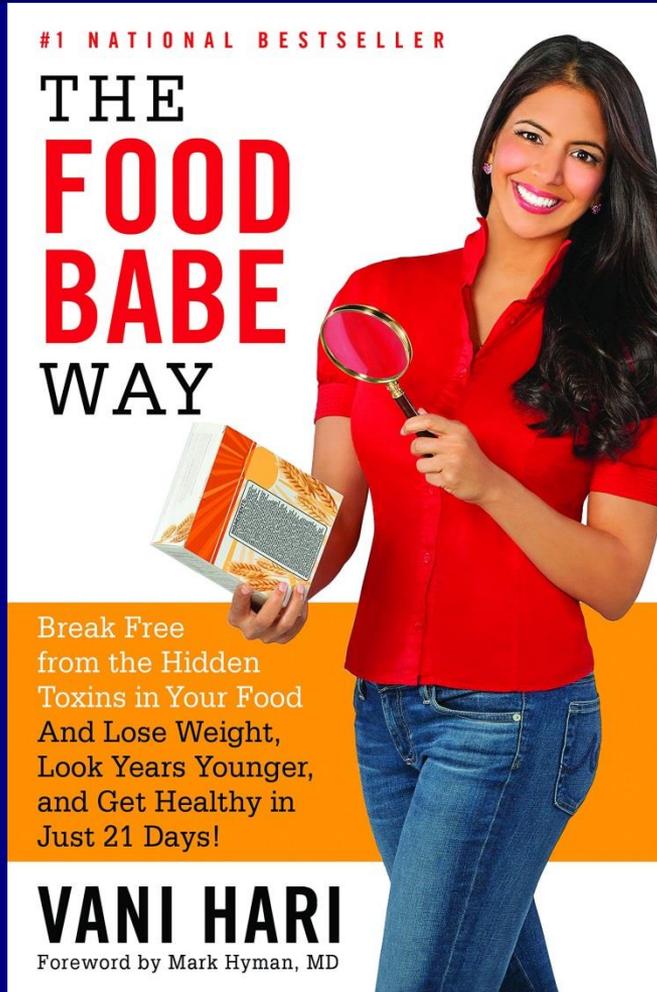
They (**insert enemy here**) worked against everything we've worked so hard to build, and they don't care about (**insert shared value here**). Make no mistake, they're the enemy, and they won't stop until we're all destroyed.



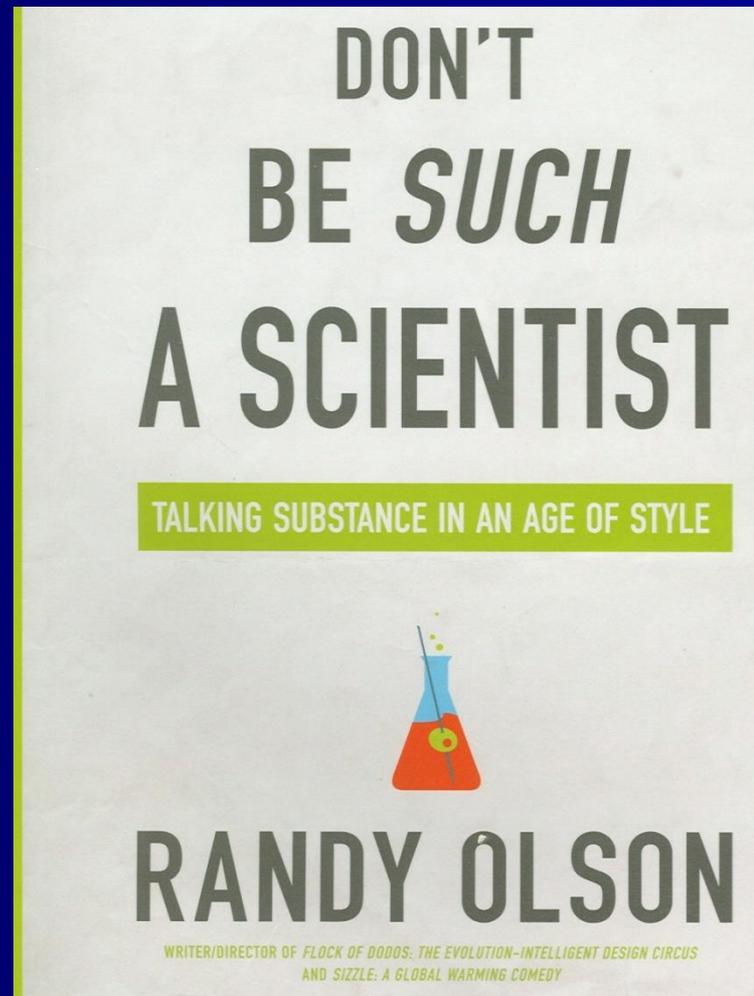


# Narratives that are based on emotion or fear are difficult to address using logic or reason

Jenny McCarthy – Vaccinations    Vani Hari – Chemicals in food

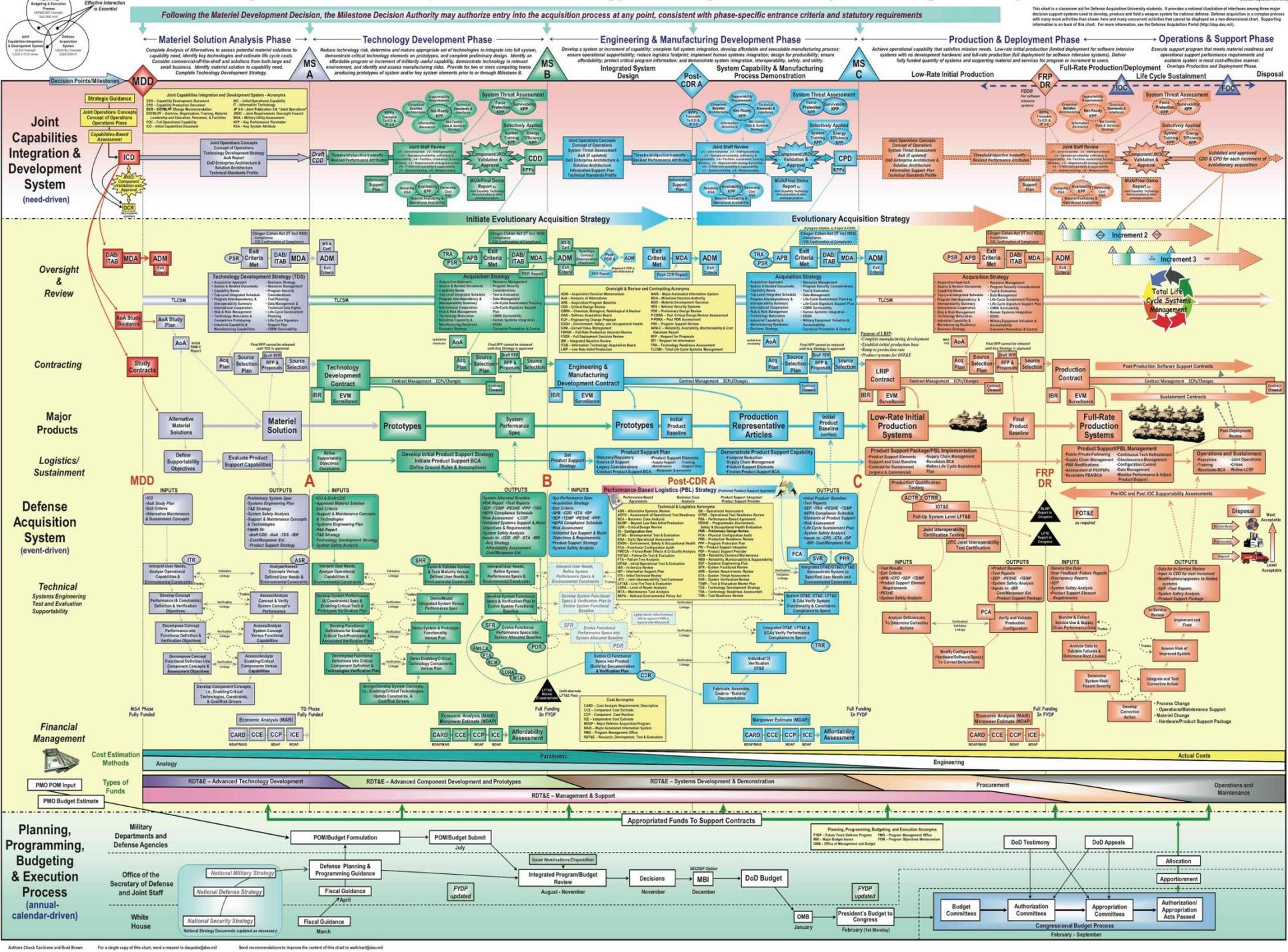


Part of the problem is that communication styles need to differ depending upon the audience



# How Academic audiences respond to various aspects of communication

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



Authors Chuck Cochran and Brad Brown  
 For a single copy of this chart, send a request to daps@do.mil  
 Send recommendations to improve the content of this chart to waltch@do.mil

This chart is a classroom aid for Defense Acquisition University students. It provides a national illustration of interfaces among three major decision support systems used to develop, produce and field a weapon system for national defense. Defense acquisition is a complex process with many more activities than shown here and many concurrent activities that cannot be displayed on a two-dimensional chart. Supporting information is on back of this chart. For more information, see the Defense Acquisition Portal (http://dap.dau.mil).



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



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

# GMOs

5 DANGERS + THE AUTISM/ALLERGY CONNECTION



**400% increase**  
in allergies since GMOs were introduced.



Coalition Powered by Green America  
**GMO INSIDE!**

#SimilacNoGMO



Will **Roundup** rob him of someday having babies of his own?

Gerber uses RoundUp Ready GMOs in its Good Starts for American babies. But a new study published in the journal *Free Radical Medicine & Biology* implicates Roundup in male infertility at concentration levels well within the EPA's "safe levels" for food.

**That's NOT a Good Start, Gerber!**

One New Apple Product Your Family Doesn't Need.



Just say "know" to genetically engineered apples.



Orange Juice May Soon Contain Pig Genes

Genetically Modified Oranges gene spliced with Frogs



Coming soon to a grocery store near you.

Pro-GMO organizations argue that in a world where food is scarce, they are helping to feed the hungry. Feeding people untested lab modified food (GMOs) is like one giant science experiment gone bad! You can feed rice mixed with a little rat poison to a starving African child each day and claim, "I am feeding this child!" The ability to stave off starvation does not counteract the poisonous side-effects!

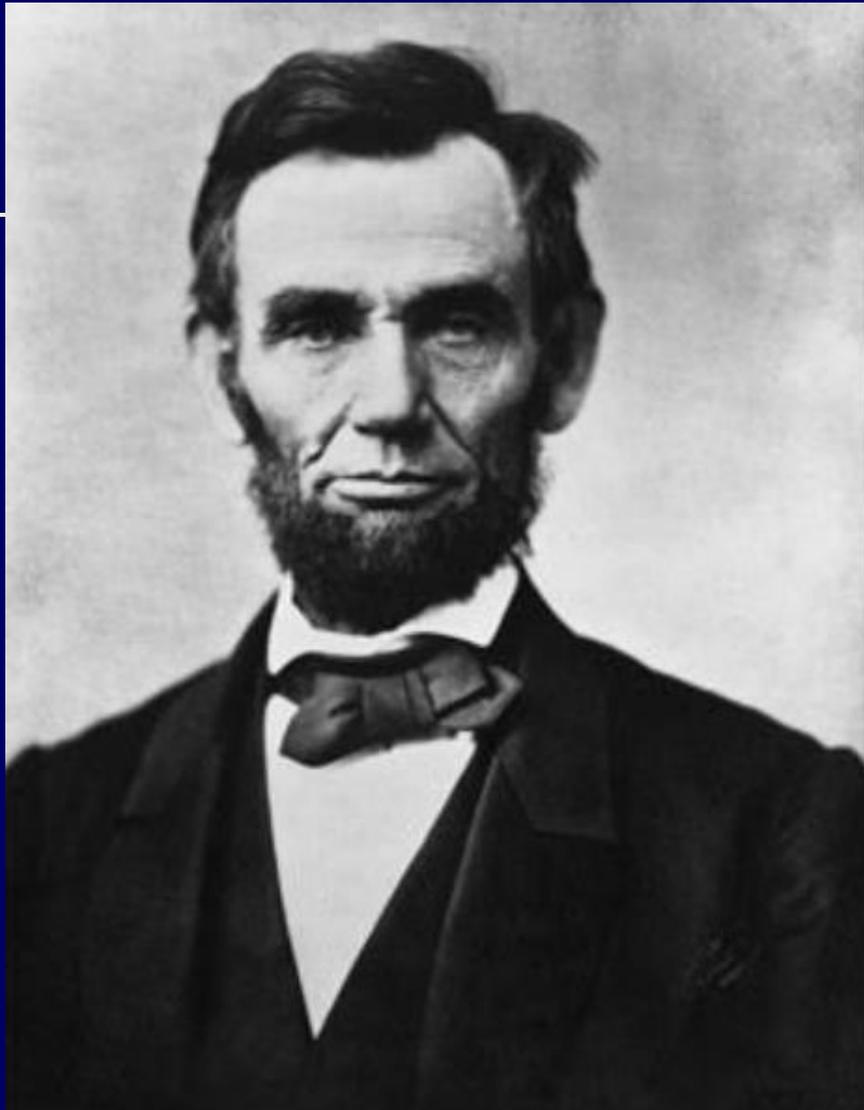
homecuresthatwork.com

**GMO FOOD IS DANGEROUS!**



United Nations Photo





**“Don’t believe everything you read on the Internet just because there’s a picture with a quote next to it.”**

**—Abraham Lincoln**

<http://weknowmemes.com/2012/07/dont-believe-everything-you-read-on-the-internet>

# Gene Edited Polled Calves

Naturally-occurring bovine allele at polled locus



Carlson DF, Lancto CA, Zang B, Kim E-S, Walton M, et al. 2016. **Production of hornless dairy cattle from genome-edited cell lines.** Nat Biotech 34: 479-81

[https://www.youtube.com/watch?v=-Qks\\_LMmodw](https://www.youtube.com/watch?v=-Qks_LMmodw)



# Dorothy, we are not in Kansas anymore – truthiness exists

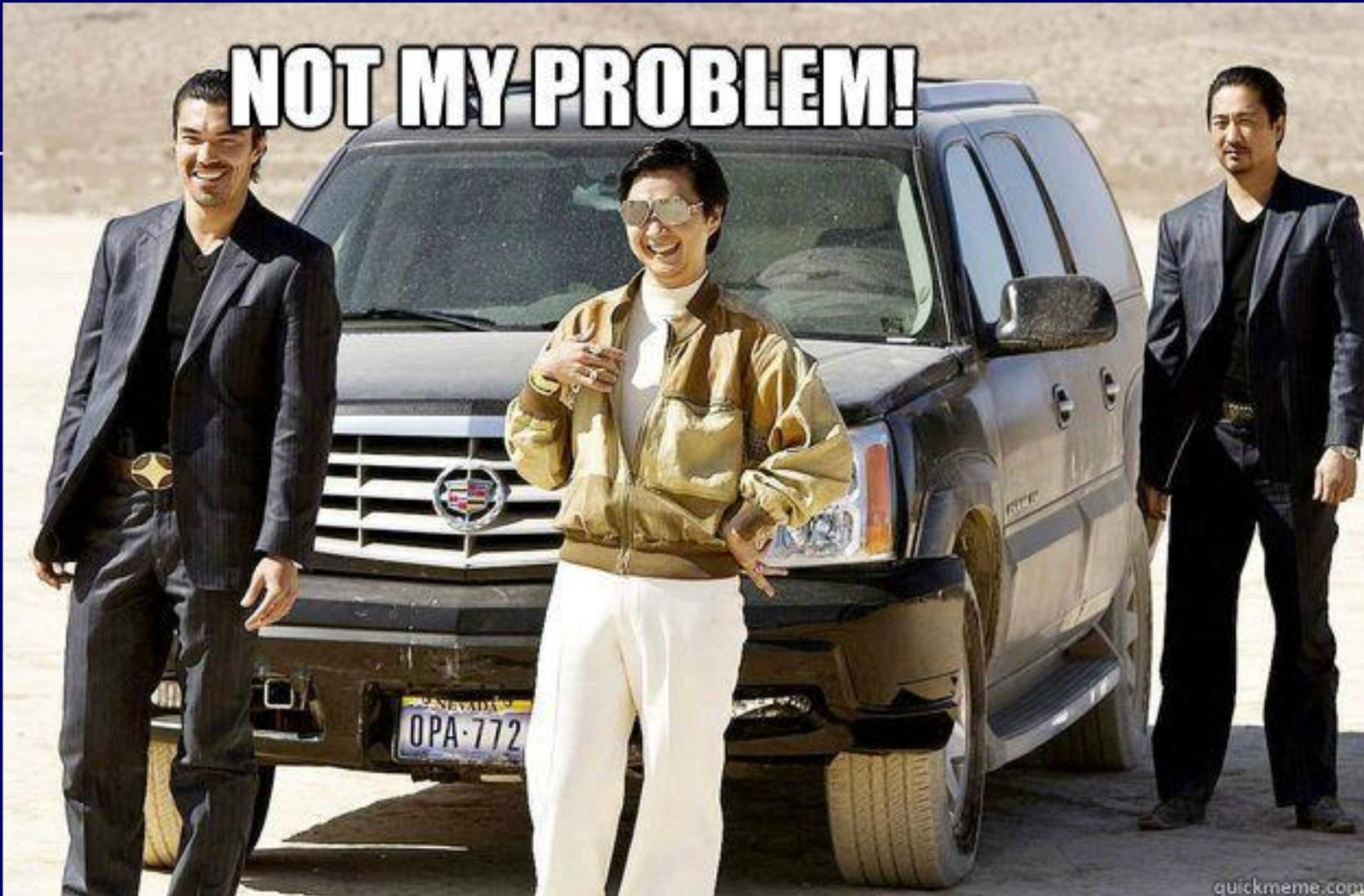


- Special interest groups have become disciplined, strategic and have little interest in scientific accuracy
- Need to communicate in language the public can relate to (and understand!)
- Social media has changed everything – need to respond in real time





# Mr. Chow from The Hangover



<https://www.pinterest.com/pin/475552041874709302/>

Crop/species	2014 total production	2014	Amount needed at 1950s rate	Additional needed
<p>Soybeans</p> 	<p>3,927,090,000 BU (235,562,540,000 lb) (106,849,370,802 kg)</p>	<p>82,591,000 Acres (33,423,392 ha)</p>	<p>180,971,889 Acres (73,236,725 ha)</p>	<p>~ 98 million Acres  (~40 million ha)</p>
<p>Corn</p> 	<p>14,215,532,000 BU (796,069,979,000 lb) (361,091,268,460 kg)</p>	<p>83,136,000 Acres (33,643,946 ha)</p>	<p>372,134,346 Acres (150,597,427 ha)</p>	<p>~ 289 million Acres  (~120 million ha)</p>
<p>Dairy cattle</p> 	<p>206,046,000,000 lbs milk (93,460,893,469 kg)</p>	<p>9,257,166 head</p>	<p>38,774,181 head</p>	<p>~ 30 million head </p>
<p>Broilers</p> 	<p>51,373,100,000 lbs meat (23,302,446,000 kg)</p>	<p>8,544,100,000 head</p>	<p>16,679,545,455 head</p>	<p>~ 8 billion head + an additional 81.5 billion lbs feed due to less efficient FCR</p>

# FEAST ON FACTS

FROM ACADEMY AWARD® NOMINEE **SCOTT HAMILTON KENNEDY**

# FOOD|EVOLUTION

NARRATED BY **NEIL DEGRASSE TYSON**

BLACK VALLEY FILMS IN ASSOCIATION WITH BOOMDOZER, INC. "FOOD EVOLUTION" A FILM BY SCOTT HAMILTON KENNEDY  
DIRECTOR OF PHOTOGRAPHY LARKIN DONLEY ORIGINAL SCORE BY WILLIAM KINGSWOOD SUPERVISING SOUND EDITOR PAUL HACKNER EDITED BY ALEX BLATT SCOTT D. HANSON SCOTT HAMILTON KENNEDY  
NARRATOR & SCRIPT CONSULTANT NEIL DEGRASSE TYSON WRITTEN & PRODUCED BY TRACE SHEEHAN SCOTT HAMILTON KENNEDY  
DIRECTED BY SCOTT HAMILTON KENNEDY



[WWW.FOODREVOLUTIONMOVIE.COM](http://WWW.FOODREVOLUTIONMOVIE.COM)



[www.foodevolutionmovie.com](http://www.foodevolutionmovie.com)

Twitter: @foodevomovie

To request a screening contact: [matt@foodevolutionmovie.com](mailto:matt@foodevolutionmovie.com)







# Perhaps doing nothing is even more scary than participating in the debate!



*"It's a foreboding I have – maybe ill-placed – of an America in my children's generation or my grandchildren's generation.... when clutching our horoscopes, our critical faculties in steep decline, unable to distinguish between what's true and what feels good, we slide almost without noticing, into superstition and darkness"*

**Carl Sagan**

(9 Nov 1934 - 20 Dec 1996)

Picture you will probably never see as part of speaker profile – although sometimes apropos – riding the "Drop of Death" at the State fair

**Need humor? Pretty much**



# Questions

## UC DAVIS ANIMAL SCIENCE

My laboratory receives public funding support from the National Institute of Food and Agriculture and the Biotechnology Risk Assessment Grant (BRAG) program, U.S. Department of Agriculture, under award numbers 2011-68004-30367, 2013-68004-20364, 2015-67015-23316 and 2015-33522-24106.



United States  
Department of  
Agriculture

National Institute  
of Food and  
Agriculture

