

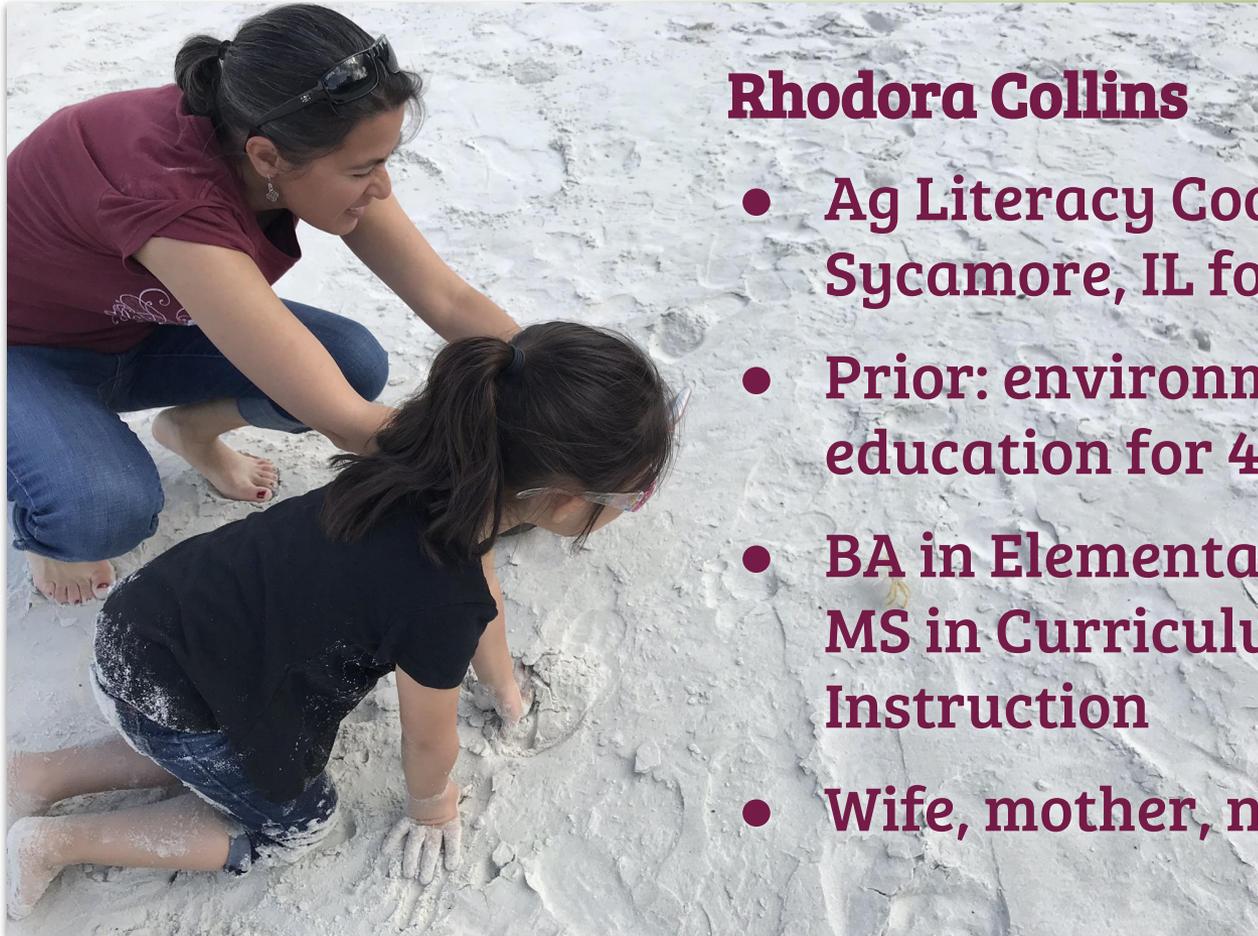
Thinking Critically about Food, Farming, and Sustainability

National AITC Conference 2018

Rhodora Collins

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Who am I?



Rhodora Collins

- Ag Literacy Coordinator in Sycamore, IL for 20+ years
- Prior: environmental education for 4-5 years
- BA in Elementary Education, MS in Curriculum & Instruction
- Wife, mother, nature-lover

Who are you?



Do you ...

- Work in agriculture?
- Work outside of agriculture, but educate about agriculture?

Why are you here?

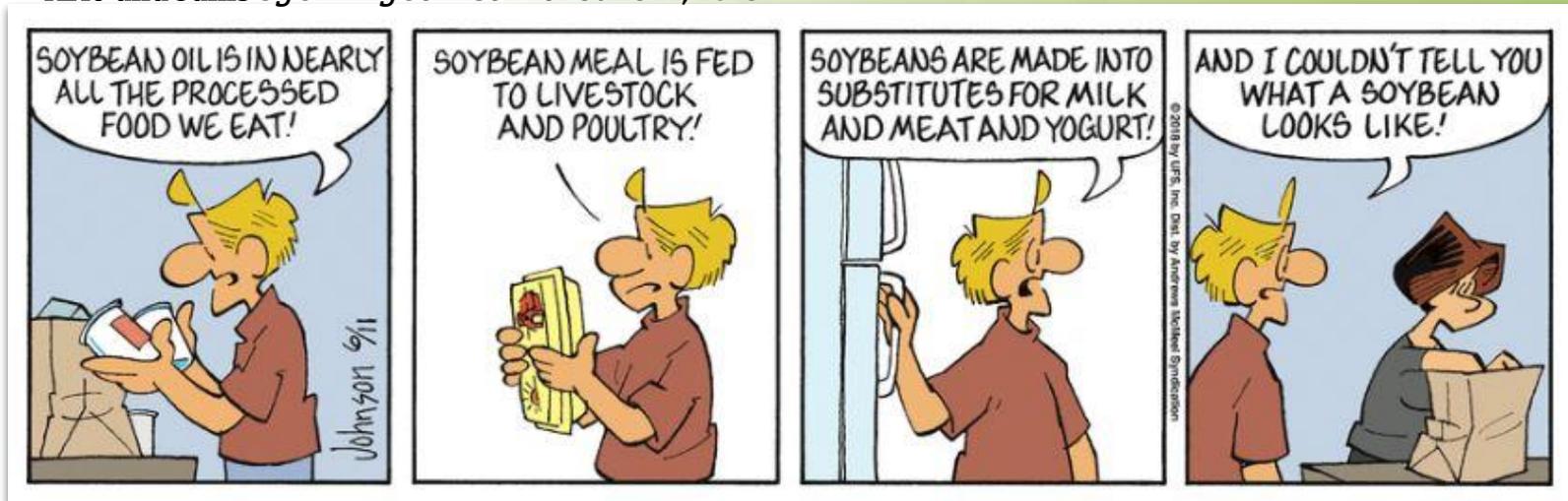
“Thinking Critically about Farming, Food, and Sustainability

Many consumers have questions about the food they purchase. Are certain food production practices harmful to our land, air, or water?

What does it mean for agriculture to be sustainable? Are farmers good stewards of the earth? Does consuming meat or milk support animal cruelty? Does buying conventional produce or eating meat promote environmental harm? During this workshop, participants will investigate and compare sources of food and farming-focused information, try activities that exercise critical thinking and active discussion, and discover ways to critically explore agricultural and environmental topics in the classroom and beyond.”

What's in our food?

~Arlo and Janis by Jimmy Johnson for June 11, 2018



1. Examine a food package label.
2. What questions do you have? Write them down.

What's in our food?



What were some of the questions you wrote down?

Usually when we face these kinds of questions, we're standing in the grocery store aisle. How do we make our buying decisions?

Image source: <https://isorepublic.com/grocery-shopping/>

Our choices make a difference

Our grocery store choices ripple through the agriculture industry, impacting how food manufacturers produce, label, and market their products, and how farmers produce crops and livestock.



Image source: DeKalb County Farm Bureau

How well do we understand the choices we are given?

Grocery shopping confusion

**ALL-NATURAL, NON-GMO, 100% GLUTEN-FREE
INTERNET VIDEO!**



<https://bit.ly/2JS00Tr>

In the grocery store ...

What do you SEEK?

What do you AVOID?

Grocery shopping goals

So we definitely **SEEK** and **AVOID** certain things when we're shopping for food.

Save
\$\$\$\$\$



Save the
Planet

Stay
healthy

Happy
animals

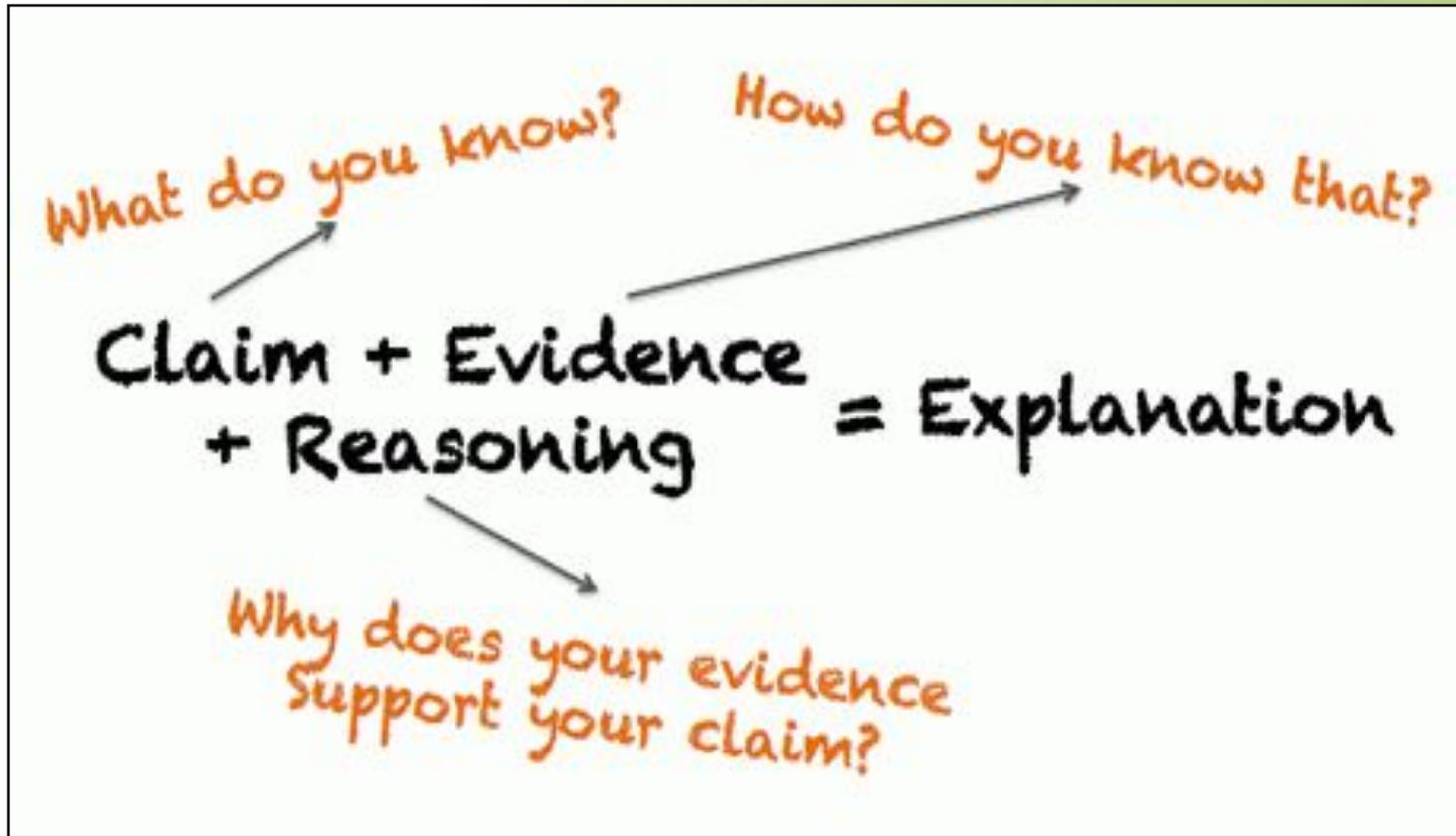
Critical Thinking

Claim

Evidence

Reasoning

Critical Thinking



Would you eat this food?

INGREDIENTS: WATER (75%), **SUGARS (12%)** (GLUCOSE (48%), FRUCTOSE (40%), SUCROSE (2%), MALTOSE (<1%)), STARCH (5%), FIBRE E460 (3%), **AMINO ACIDS (<1%)** (GLUTAMIC ACID (19%), ASPARTIC ACID (16%), HISTIDINE (11%), LEUCINE (7%), LYSINE (5%), PHENYLALANINE (4%), ARGININE (4%), VALINE (4%), ALANINE (4%), SERINE (4%), GLYCINE (3%), THREONINE (3%), ISOLEUCINE (3%), PROLINE (3%), TRYPTOPHAN (1%), CYSTINE (1%), TYROSINE (1%), METHIONINE (1%)), **FATTY ACIDS (1%)** (PALMITIC ACID (30%), OMEGA-6 FATTY ACID: LINOLEIC ACID (14%), OMEGA-3 FATTY ACID: LINOLENIC ACID (8%), OLEIC ACID (7%), PALMITOLEIC ACID (3%), STEARIC ACID (2%), LAURIC ACID (1%), MYRISTIC ACID (1%), CAPRIC ACID (<1%)), ASH (<1%), PHYTOSTEROLS, E515, OXALIC ACID, E300, E306 (TOCOPHEROL), PHYLLOQUINONE, THIAMIN, **COLOURS** (YELLOW-ORANGE E101 (RIBOFLAVIN), YELLOW-BROWN E160a), **FLAVOURS** (3-METHYLBUT-1-YL ETHANOATE, 2-METHYLBUTYL ETHANOATE, 2-METHYLPROPAN-1-OL, 3-METHYLBUTYL-1-OL, 2-HYDROXY-3-METHYLETHYL BUTANOATE, 3-METHYLBUTANAL, ETHYL HEXANOATE, ETHYL BUTANOATE, PENTYL ACETATE), 1510, NATURAL RIPENING AGENT (ETHENE GAS).

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Too many ingredients

Scary-sounding chemicals

I don't even know what some of that stuff is.

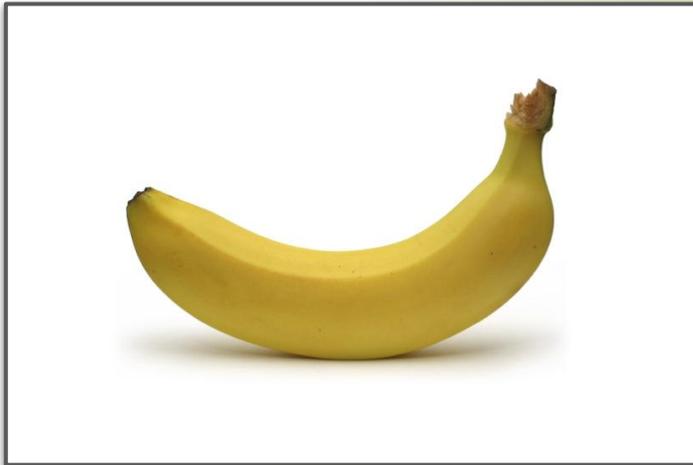
Too much sugar

Food dyes?

I can't even pronounce some of that.

It's not natural.

What about this food?



It's not processed.

It's a "whole food."

It's a fruit.

It's healthy.

No preservatives

**It has one ingredient:
banana.**

It's natural.

We fall prey to Logical Fallacies

A logical fallacy is a flaw in reasoning.

Logical fallacies are like tricks or illusions of thought, and they're often very sneakily used by politicians and the media to fool people.

~ from YourLogicalFallacyIs.com

We fall prey to Logical Fallacies

~**Frazz** by Jef Mallett for June 18, 2018



Image source: gocomics.com

Logical Fallacies in Labeling

Appeal to nature

Making the argument that because something is 'natural' it is therefore valid, justified, inevitable, good, or ideal.

AN ALL-NATURAL BANANA



INGREDIENTS: WATER (75%), **SUGARS (12%)** (GLUCOSE (48%), FRUCTOSE (40%), SUCROSE (2%), MALTOSE (<1%)), STARCH (5%), FIBRE E460 (3%), **AMINO ACIDS (<1%)** (GLUTAMIC ACID (19%), ASPARTIC ACID (16%), HISTIDINE (11%), LEUCINE (7%), LYSINE (5%), PHENYLALANINE (4%), ARGININE (4%), VALINE (4%), ALANINE (4%), SERINE (4%), GLYCINE (3%), THREONINE (3%), ISOLEUCINE (3%), PROLINE (3%), TRYPTOPHAN (1%), CYSTINE (1%), TYROSINE (1%), METHIONINE (1%)), **FATTY ACIDS (1%)** (PALMITIC ACID (30%), OMEGA-6 FATTY ACID: LINOLEIC ACID (14%), OMEGA-3 FATTY ACID: LINOLENIC ACID (8%), OLEIC ACID (7%), PALMITOLEIC ACID (3%), STEARIC ACID (2%), LAURIC ACID (1%), MYRISTIC ACID (1%), CAPRIC ACID (<1%)), ASH (<1%), PHYTOSTEROLS, E515, OXALIC ACID, E300, E306 (TOCOPHEROL), PHYLLOQUINONE, THIAMIN, **COLOURS** (YELLOW-ORANGE E101 (RIBOFLAVIN), YELLOW-BROWN E160a), **FLAVOURS** (3-METHYLBUT-1-YL ETHANOATE, 2-METHYLBUTYL ETHANOATE, 2-METHYLPROPAN-1-OL, 3-METHYLBUTYL-1-OL, 2-HYDROXY-3-METHYLETHYL BUTANOATE, 3-METHYLBUTANAL, ETHYL HEXANOATE, ETHYL BUTANOATE, PENTYL ACETATE), 1510, NATURAL RIPENING AGENT (ETHENE GAS).

Logical fallacies derail our ability to think critically.

“It’s natural, so it
must be [safer/
healthier/better]
than artificial.”

~poster from a series by James Kennedy,
<https://jameskennedymonash.wordpress.com>

Can you identify logical fallacies in how we think & talk about food?

“There are more GMOs in our food and at the same time the rates of obesity and food allergies have increased.”

Can you identify logical fallacies in how we think & talk about food?

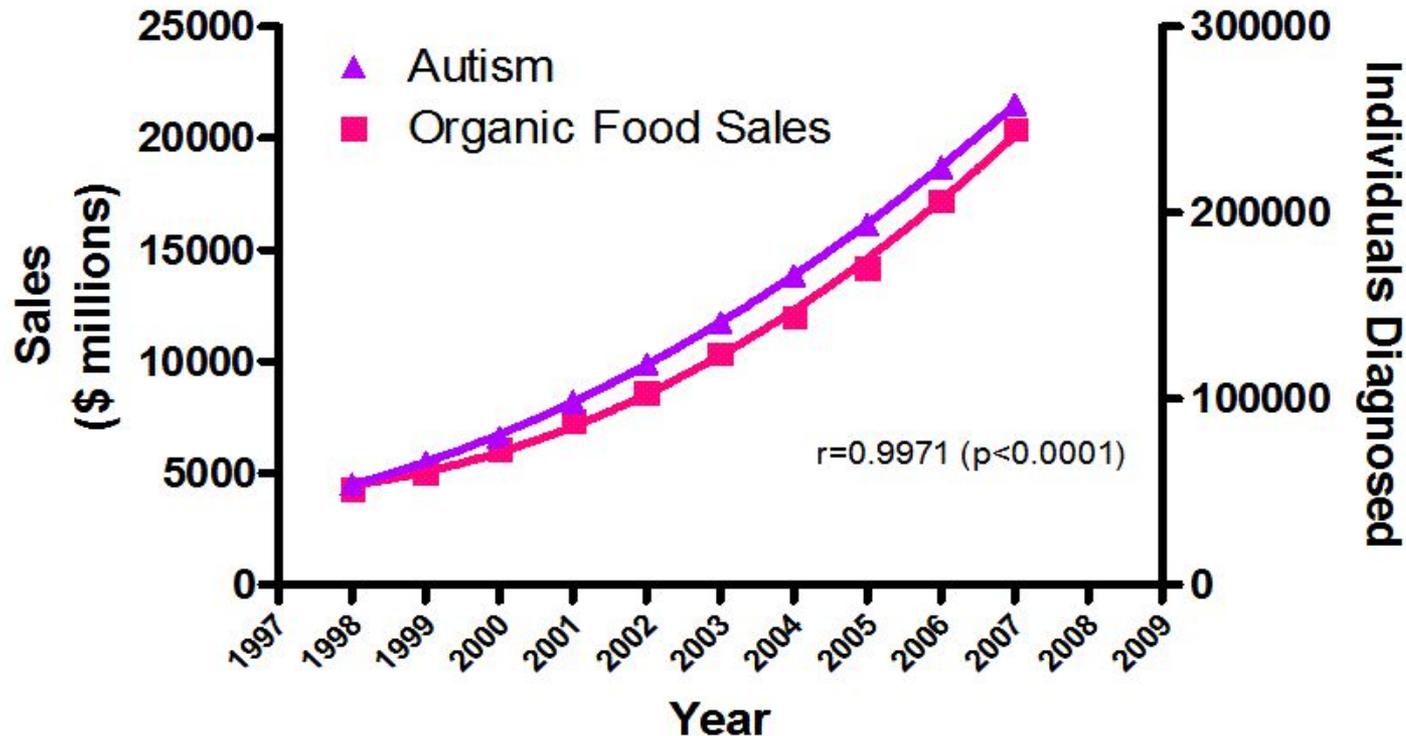
“My doctor told me to avoid pesticides by buying organic fruits and vegetables whenever possible.”

Can you identify logical fallacies in how we think & talk about food?

“You can’t tell me that all the chemicals and crap they put in processed food aren’t contributing to the rise in cancer.”

Wait. What? Correlation ≠ Causation!

The real cause of increasing autism prevalence?



Sources: Organic Trade Association, 2011 Organic Industry Survey; U.S. Department of Education, Office of Special Education Programs, Data Analysis System (DANS), OMB# 1820-0043: "Children with Disabilities Receiving Special Education Under Part B of the Individuals with Disabilities Education Act"

Logical Fallacies in Labeling

False Cause Fallacy

Presuming that a real or perceived relationship between things means that one is the cause of the other.

Remember, CORRELATION ISN'T CAUSATION.

Can you identify logical fallacies in how we think & talk about food?

“As soon as we switched our baby daughter from cow’s milk formula to soy formula, her digestive issues cleared up. It’s all the hormones and antibiotics farmers give their cows.”

Values on the line



Where do you stand on this statement?

"Buying organic food is the best way to promote agricultural sustainability."

1 = strongly disagree

10 = strongly agree

"Values on the Line" is a lesson from Project Learning Tree

Label Claims: **Natural**



What is the implicit claim being made?
Natural is desirable; artificial is not.

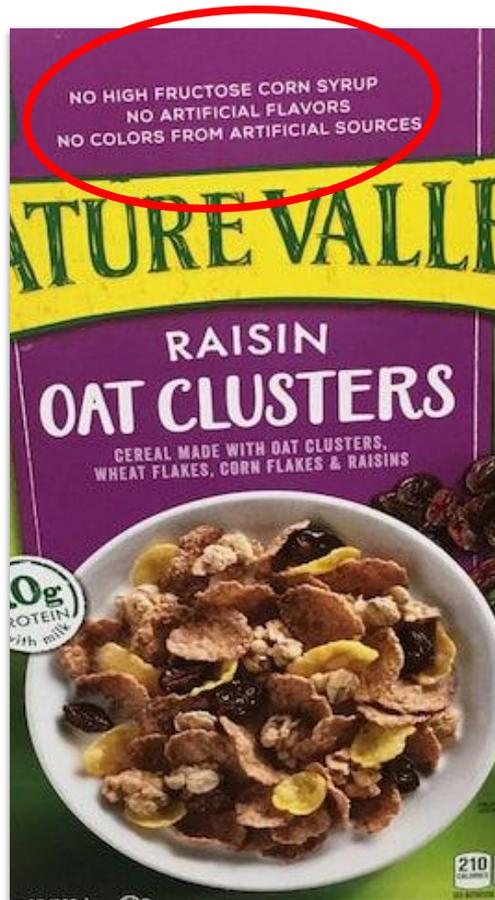
What does 'natural' mean?

“Although the FDA has not engaged in rulemaking to establish a formal definition for the term “natural,” we do have a longstanding policy concerning the use of “natural” in human food labeling. The FDA has considered the term “natural” to mean that nothing artificial or synthetic (including all color additives regardless of source) has been included in, or has been added to, a food that would not normally be expected to be in that food. However, this policy was not intended to address food production methods, such as the use of pesticides, nor did it explicitly address food processing or manufacturing methods, such as thermal technologies, pasteurization, or irradiation.”

~ from fda.gov



Label Claims: No High Fructose Corn Syrup



What is the implicit claim being made?

High Fructose Corn Syrup is bad.

How is high fructose corn syrup different than table sugar?

Table sugar (sucrose) is 50% fructose & 50% glucose. HFCS can be either 55% fructose/45% glucose or 42% fructose/58% glucose. The impact of table sugar and HFCS on our bodies is the same.

Image source: unknown

Label Claims: Organic

What is the implicit claim being made?

Organic is desirable.

What does the “organic” label mean?



“USDA certified organic foods are grown and processed according to federal guidelines addressing, among many factors, soil quality, animal raising practices, pest and weed control, and use of additives. Organic producers rely on natural substances and physical, mechanical, or biologically based farming methods to the fullest extent possible.

Produce can be called organic if it’s certified to have grown on soil that had no prohibited substances applied for three years prior to harvest. Prohibited substances include most synthetic fertilizers and pesticides.”

~from USDA.gov, Organic 101: What the USDA Organic Label Means

Image source: <http://www.albertleafarmersmarket.com/7-reasons-eat-organic-food/>

Label Claims: **Non-GMO**

What is the implicit claim being made?
GMOs are bad.



Are GMOs safe?

“Although about 90 percent of scientists believe G.M.O.s are safe—a view endorsed by the American Medical Association, the National Academy of Sciences, the American Association for the Advancement of Science and the World Health Organization—only slightly more than a third of consumers share this belief.

~from The New York Times, Are G.M.O. Foods Safe? By Jane Brody, April 23, 2018

Image sources: https://no.m.wikipedia.org/wiki/File:NON_GMO.jpg,
<https://nongmoproject.salsalabs.org/nongmoproject/index.html>

More Label Claims:

No added hormones

No artificial colors

No preservatives

No added sugars

Antibiotic-free

Gluten-free

Cage-free

Fat-free

Finally settling down to my vegan, gluten free, soy free, antibiotics free, raw, non GMO, organic, fat free, low carb meal!



Exclusion Labeling

Why do so many food labels tell us what ISN'T in the product, rather than what IS?



Image source: Kevin Folta, <https://bit.ly/2Edj9eW>

Check your bias at the door

Cognitive biases make our judgments irrational. We have evolved to use shortcuts in our thinking, which are often useful, but a cognitive bias means there's a kind of misfiring going on causing us to lose objectivity.

~ from *YourBias.is*

Exclusion Labeling: Check your bias ...



What bias(es) might we fall prey to when food labels tell us what ISN'T in the product, rather than what IS?

Image source: unknown

Exercise: Check your bias ...



Your mother-in-law watches Dr. Oz faithfully. She admires the fact that he's a surgeon and thinks he's handsome and sensitive. She is following his 28-Day Inflammation-Busting Plan which includes avoiding dairy and eating lots of cabbage soup.

Image source: <https://iguanahut.com/healthy-feeding-for-your-iguana/>

Exercise: Check your bias ...

You have noticed that your son bounces off the walls every time he eats cake and ice cream. You Google it, and sure enough, an article titled “Shocking New Study Reveals Sugar’s Effect on Behavior” pops up.



It confirms what you have observed in your child. Another article in the search results is titled “Review of research reveals hyperactivity a result of overstimulation, not sugar,” but you don’t read it because you know it can’t be accurate.

Exercise: Check your bias ...



You are active in a parenting group on Facebook. Most of the moms adamantly avoid buying foods with artificial colors or preservatives. Your cousin, who is not in this group but is a registered dietitian with a degree in food chemistry, says she's not too concerned about most food additives, but you decide to stick with the advice from your Facebook group and avoid anything "artificial."

Image source: <https://bit.ly/2tb69jh>

What if our food choices backfire?

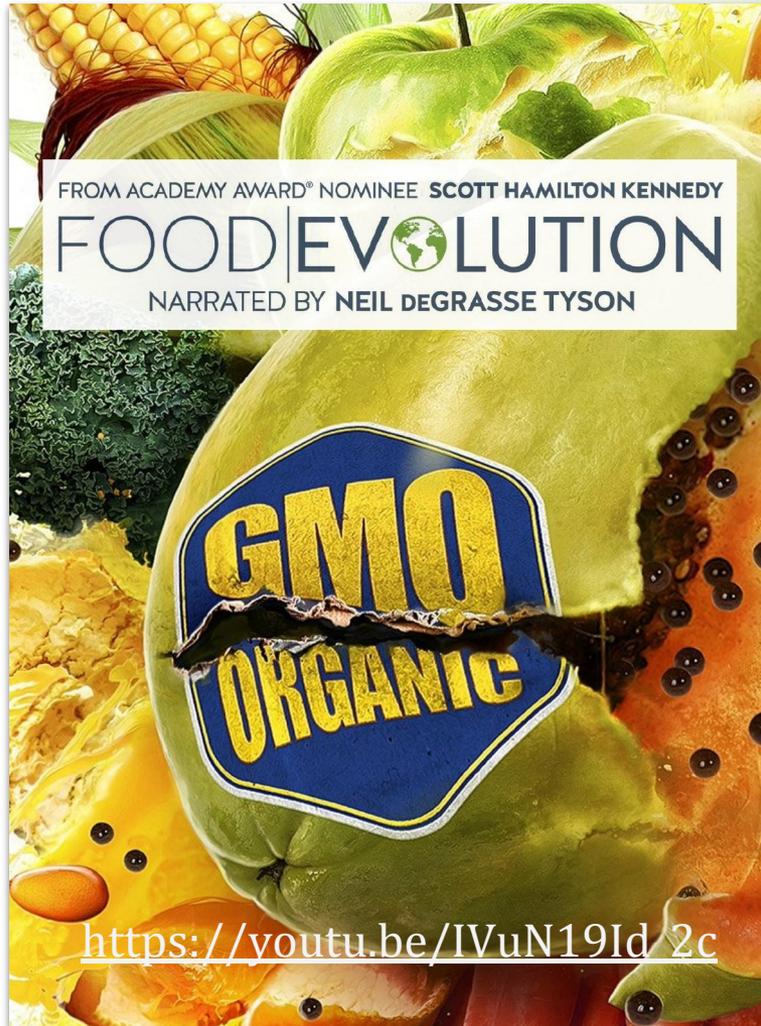
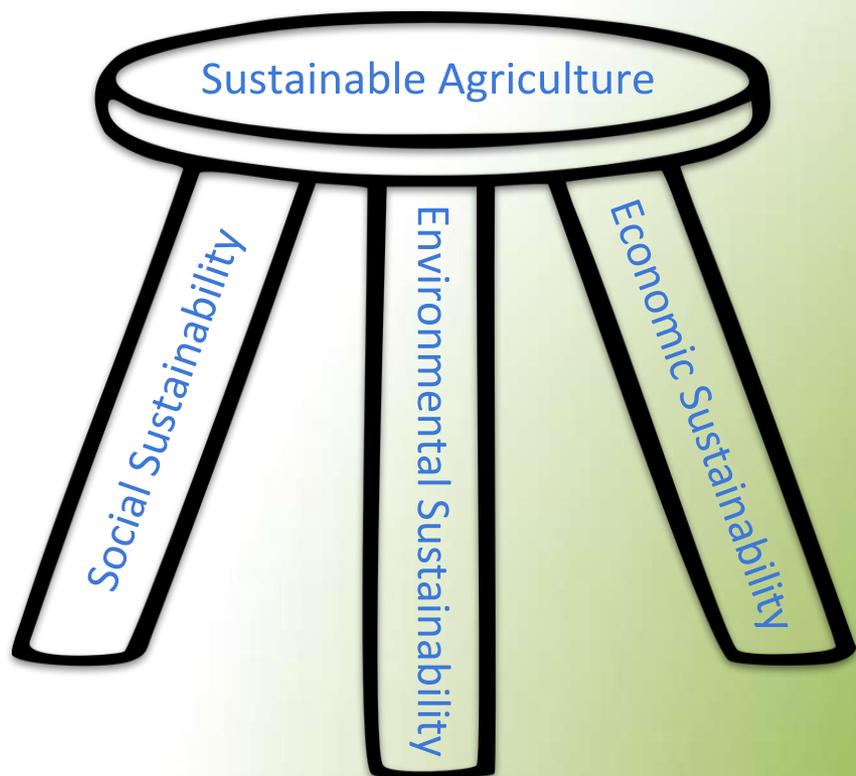


Image source: [FoodEvolutionmovie.com](https://youtu.be/IVuN19Id/2c)

At the end of this trailer, Mark Lynas asks, “What if we got it wrong?”

Logical fallacies and cognitive biases *may lead us to food choices that hinder agricultural sustainability instead of supporting it.*

What is Sustainable Agriculture?



1. Quality of life for farmers, ranchers, and their communities
2. Stewardship of our nation's land, air, and water
3. Profit over the long term

~ from Sustainable Agriculture Research & Education (USDA SARE)

People. Planet. Profit. Without all three legs, the stool cannot stand.

How our choices can affect sustainability: an example

GMO sugar beets are modified to be herbicide-resistant, allowing the use of glyphosate to control weeds. Glyphosate is remarkably safe and effective with few environmental or human safety drawbacks.



Image source: American Sugarbeet Growers Association

Non-GMO sugar beets require more and more toxic herbicide applications to control weeds. This results in greater expense to the farmer and greater environmental impact through use of older, more dangerous and less-effective herbicides.

Yet, because of consumer concern, food companies like Hershey's have stopped using GMO sugar in many of their products.

How our choices can affect sustainability: another example

Battery cages within buildings keep laying hens safe from predators, prevent exposure to disease and temperature extremes, reduce competition with other hens, and allow for efficient feeding, waste removal, and egg collection.



Image source: PoultryTimes.com
http://www.poultrytimes.com/poultry_today/article_451f821e-52c9-11e7-a01b-fba30374137a.html

Cage-free hens are still housed indoors, but the birds are free to move around the building. The hens have more freedom of movement, but may experience increased stress because of competition with other birds. Cage-free systems also pose new challenges for waste removal, disease prevention, and egg collection.

Credible EVIDENCE matters.

Can we set aside emotion and look at good science ...
instead of B.S.? (B.S. = Bad Science)



Let's try it.

If you are on the right side (your right) of the room, Google "This New Label on Food Will Keep You From Getting Poisoned by Monsanto's Weedkiller."

If you are on the left side of the room, Google "Are synthetic pesticides more dangerous than natural ones?"

Image source: Rhodora Collins

Next time you're reading claims about food, ask yourself ...

What is the CLAIM being made?

**What is the EVIDENCE supporting this claim?
Is it credible?**

What is my REASONING for making this purchasing choice? Am I falling prey to any logical fallacies or biases?

Sources and Resources

Critical Thinking and C E R

- How To Make Sense of the Information Out There <https://bit.ly/2I2bnla>
- How to Write a Scientific Explanation <https://bit.ly/2upcCLH>

Logical Fallacies & Cognitive Biases

- YourLogicalFallacyIs.com
- YourBias.is

Chemophobia

- James Kennedy (All-Natural posters) <https://jameskennedymonash.wordpress.com/>
- Lesson: Should this product be banned? <https://bit.ly/2ymBfbW> (page 7)

Exclusion Labeling

- “Exclusion Labels, Science Denial, Boneless Watermelons and \$8 Burritos” by Kevin Folta <https://bit.ly/2Edj9eW>

Evaluating Online Resources

- News Literacy Project <https://newslit.org/>

Natural

- Natural vs. Man-Made Chemicals <https://bit.ly/1BM5wp1>

High Fructose Corn Syrup

- Sweet Misconceptions: The Truth about High Fructose Corn Syrup and “Normal Sugar” <https://bit.ly/2t9VsN5>

Organic

- Substances for Organic Crop + Livestock Production <https://bit.ly/2MDAJJC>

GMOs

- GMO Answers GMOAnswers.com
- Genetic Literacy Project GeneticLiteracyProject.org
- Sci Moms SciMoms.com