



*IX NATIONAL CONGRESS/ANNUAL MEETING
Science and Food in Current Days*
Sao Paulo, Brazil, April 11 – 13, 2018

Scientific Data vs. Consumer's Emotions

By

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Some thoughts on

The complex context
where science and
emotions about
foods interact today

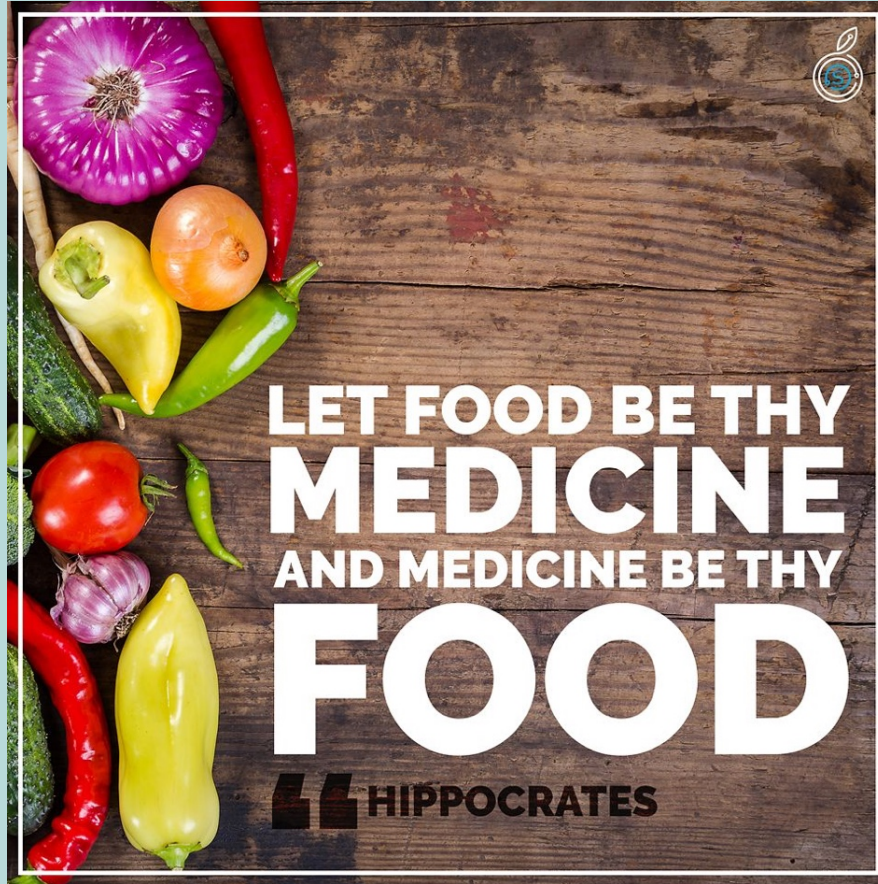
Science is not
enough



1

From the aryuvedic diet to the slim fit fashion





<https://i.pinimg.com/originals/db/70/55/db7055faeb94ea56ee0ec3b7707f07bb.jpg>



Galen of Pergamum



*On the properties
of foodstuffs*

<https://amedia.britannica.com/54/134754-004-B9E5D1C5.jpg>



Food

Health



Traditional chinese foods

Rice

Millet

Wheat

Noodles

Tofu

Tea

Meat

Sorghum

Wine

Vegetables



<https://www.ancienthistorylists.com/china-history/top-10-traditional-ancient-chinese-foods/>



Micronutrients and essential nutrients

Centuries XIX and XX

Iodine

Iron

Zinc

Vitamin C

B complex

Vitamin D

Essential
Fatty
Acids and
Amino
acids

Dietary
fiber

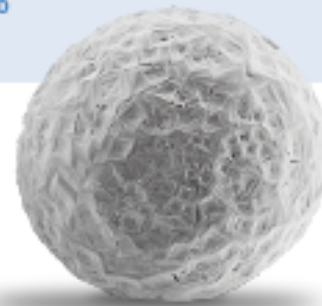




The New Shape of Salt

- Hollow sphere
- Maximised salt surface area
- Reduces sodium 25-50%

www.soda-lo.com



DASH diet



Source: National Heart, Lung and Blood Institute

The DASH diet (Dietary Approaches to Stop Hypertension) has been shown to help lower blood pressure and prevent heart disease, stroke, diabetes and even some forms of cancer. It focuses on eating more fresh fruits and vegetables.

This is a guide to how much of each food group you should eat every day, based on eating 2,000 calories per day.

UKHealthCare.
Gill Heart Institute



the **mediterranean** diet

why it works and how to get started



<https://bembu.com/wp-content/uploads/2017/05/the-mediterranean-diet.jpg>



The Vegan-macro Diet



<https://i.pinimg.com/originals/82/81/ca/8281ca815cd087da828dc5b2165b48a7.jpg>



the flexitarian diet



<https://bembu.com/wp-content/uploads/2017/08/flexitarian-diet.jpg>



#1 New York Times Bestseller!

INCLUDES A
Quick
Start Plan

GET STARTED!

DESIGNED
TO HELP YOU
LOSE
UP TO
6 to 10 lbs.
IN 2 WEEKS

The Mayo Clinic Diet

BONUS A NEW 2-WEEK Menu Guide DESIGNED TO
KICK START YOUR WEIGHT LOSS

By the weight-loss experts at Mayo Clinic



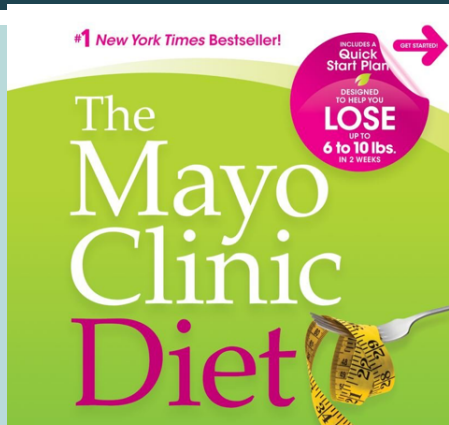
<https://images-na.ssl-images-amazon.com/images/I/61JtXd43KSL.jpg>



<http://wikivarzesh.com/wp-content/uploads/2017/08/TLC-wiki.jpg>



Food/Diet/Nutrition/Lifestyle and Health



New eating habits and beliefs

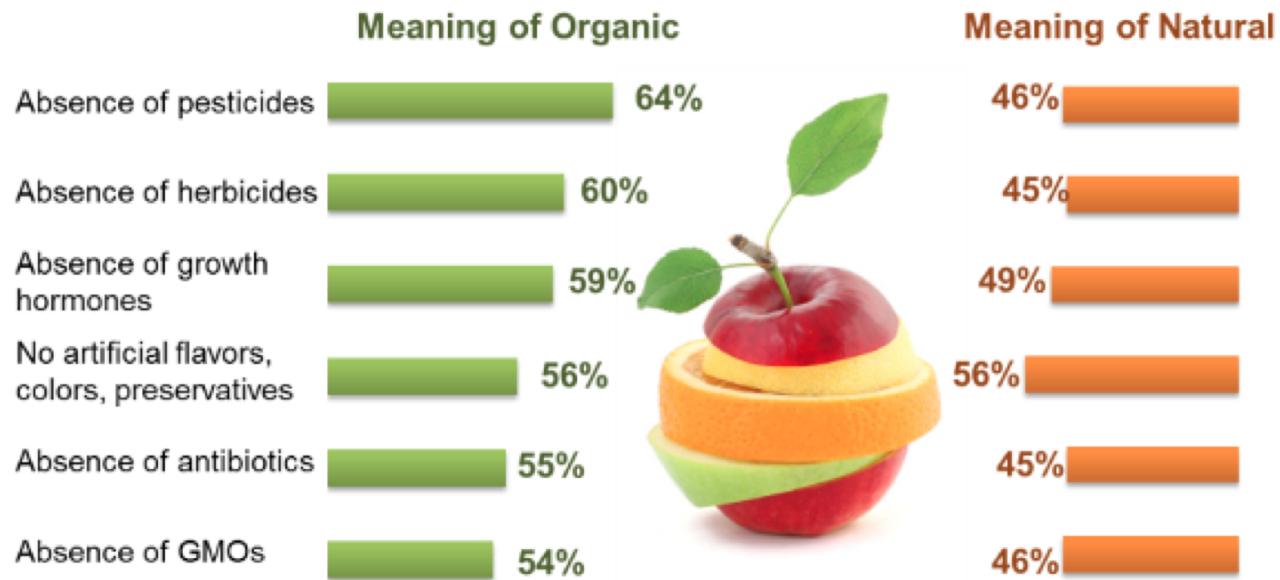




<https://img-aws.ehowcdn.com/877x500p/photos.demandstudios.com/getty/article/181/54/200464108-001.jpg>



Distinctions consumers make between "organic" and "natural"



Source: *Organic and Natural* 2012 report

© 2013 The Hartman Group, Inc.





A “HEALTHY” PERSPECTIVE

“Healthy” is often at the heart of our discussions about food. Still, how we think about “healthy” in the context of what we eat remains hotly debated.



INTERNATIONAL
FOOD INFORMATION
COUNCIL FOUNDATION

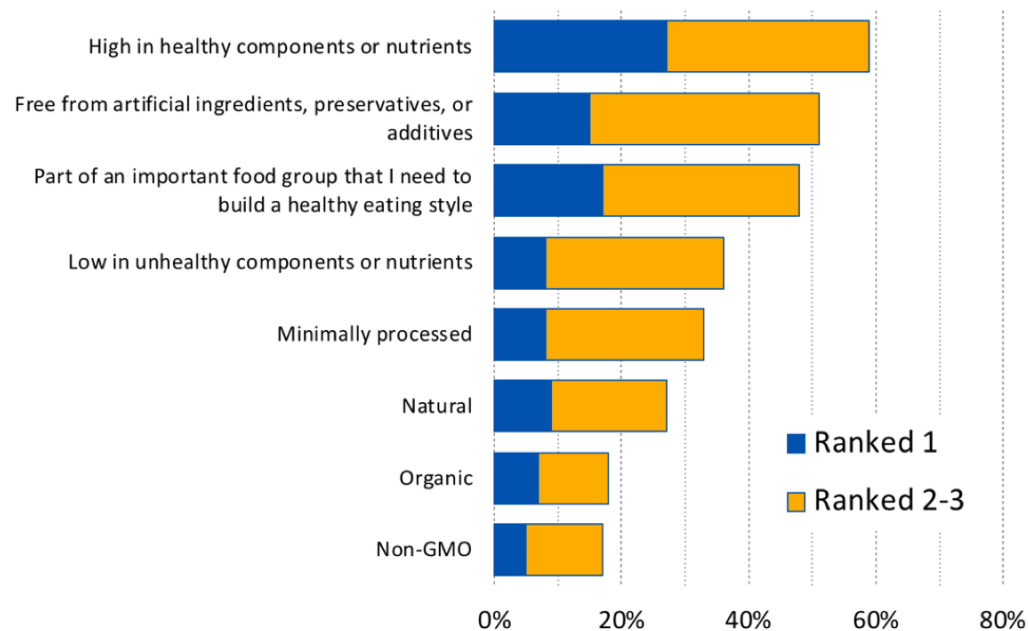
2017 FOOD & HEALTH SURVEY



Presence of healthy components important

Adults 50+ are more concerned about the positives than the negatives

How Consumers Define a Healthy Food



46%
Of college educated say "low in unhealthy components"


Men are more likely to say "low in unhealthy components"; women are more likely to say "minimally processed"

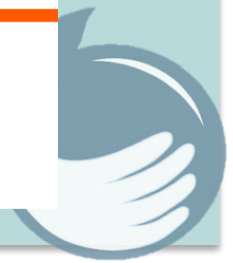
2x
Consumers in rural areas are twice as likely to choose Non-GMO

Q: How do you define a healthy food? (n=1,002)



INTERNATIONAL
FOOD INFORMATION
COUNCIL FOUNDATION

2017 FOOD & HEALTH SURVEY





http://lh3.ggpht.com/-JRK5mFdJ5_s/U7oE_joilrI/AAAAAAAAJQM/o5fUELSvWPO/s1600/2014-07-06%25252019.12.35.png



2

From rationalism to uncertainty (and postmodernism)



Rationalism

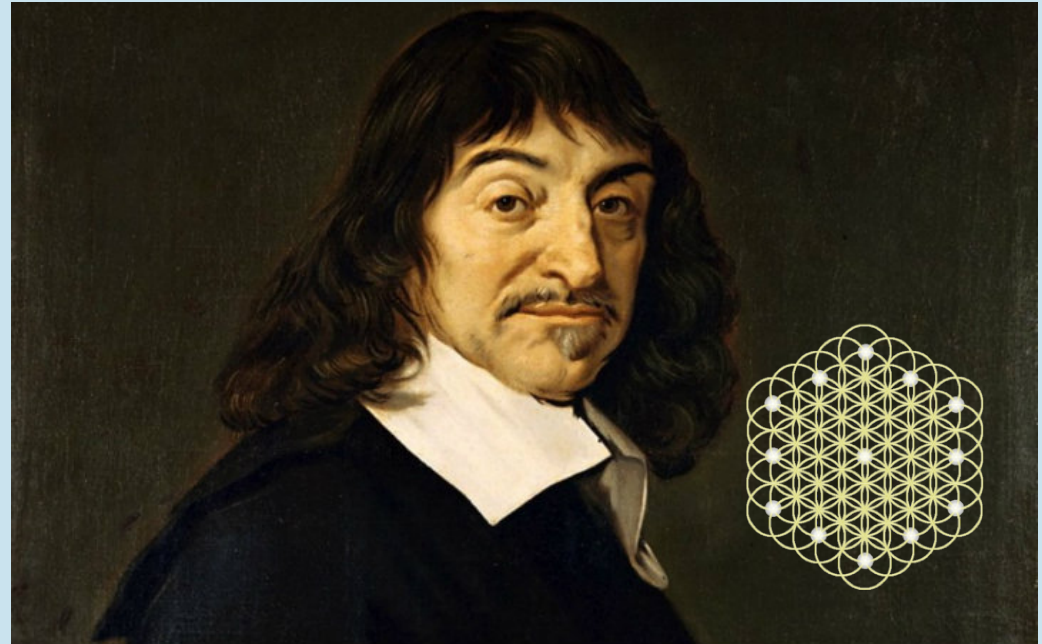
Certainty

Rationally ordered
whole

Objective evidence

Logics

Reason



Descartes, Kant, Spinoza, Leibinz,
Locke, Hume

<https://i.ytimg.com/vi/YMP9GPvN9Jc/maxresdefault.jpg>

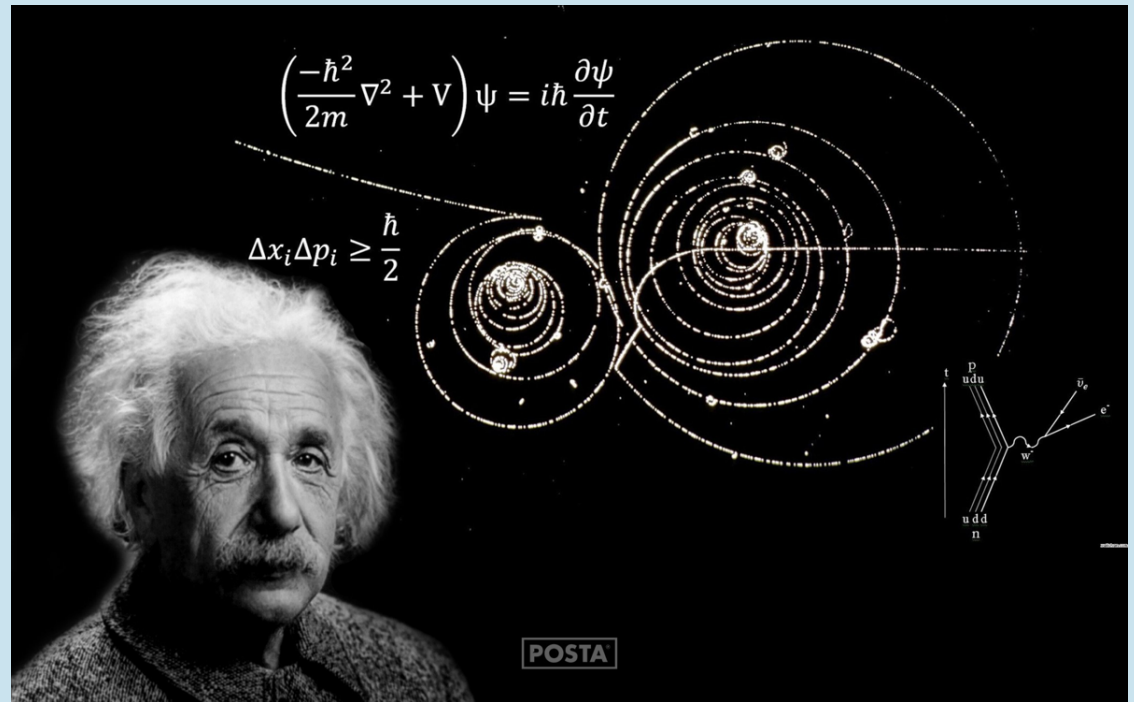


Relativism

Uncertainty

The observer's
position

The influence of
the observer



Nietzsche, Wittgenstein, Russell,
Heisenberg, Einstein

<https://k60.kn3.net/taringa/1/B/9/F/1/E/andromedatuconex/E6B.jpg>



Postmodernism

Skepticism



Moral relativism



Irreverence



Not just one
authentic reality



Subjectivism



Lyotard, Derrida, Jameson

<http://www.lafuga.cl/media/articulo/imagenes/adicionales/jean-francois-lyotard.jpg>



Post- postmodernism

Skepticism

Hipsters

Sources of
knowledge other
than science

Ancestral
knowledge

Internet



3

Millennials

Borne 1977 – 1994



Let's bake some Pão de Queijo

- Pão de Queijo is OK, is delicious and is Gluten-free
- But... Do you have
 - Organic tapioca flour?
 - Lactose free milk?
 - Eggs from pastured hens?
 - Salt from the Himalayas?
 - Authentic parmesan cheese?
 - Certified olive oil?
- Otherwise I just can't!





● **healthy food**
Término de búsqueda

+ Comparar

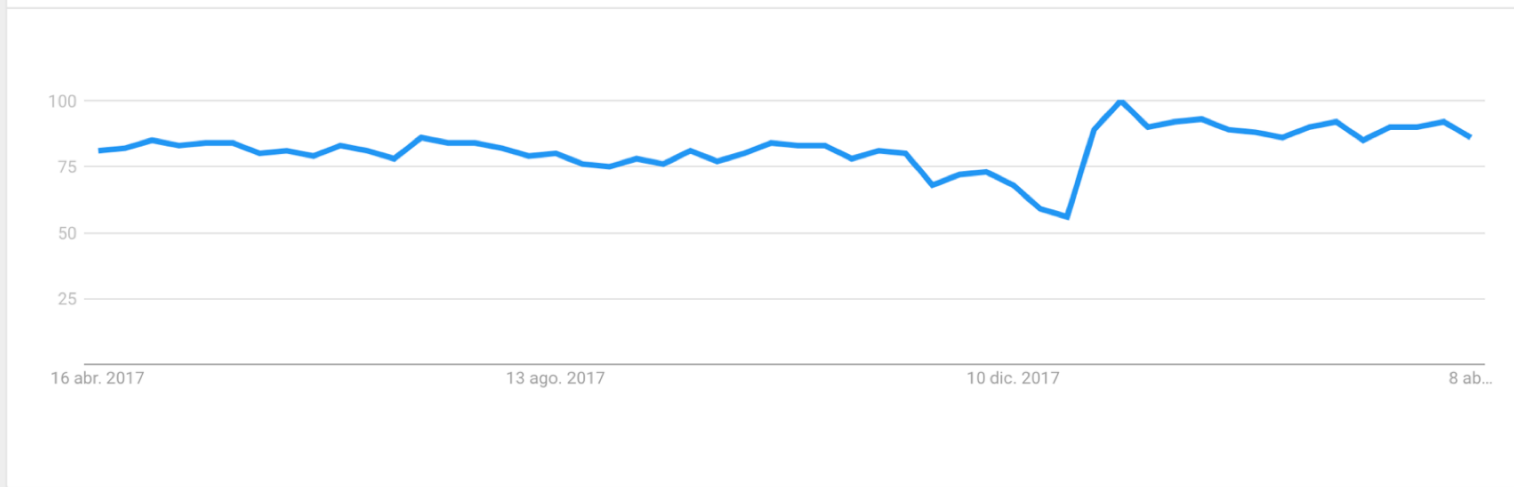
Todo el mundo ▾

Últimos 12 meses ▾

Todas las categorías ▾

Búsqueda web ▾

Interés a lo largo del tiempo ⓘ





Google Trends

Explorar



Iniciar sesión

● **healthy food**

Término de búsqueda


+ Comparar

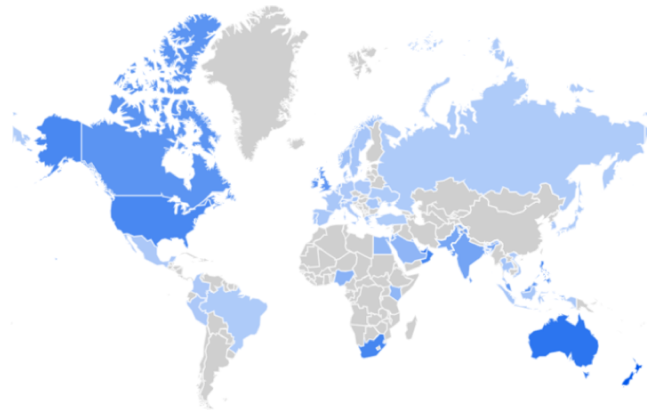
Todo el mundo ▾

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Todas las categorías ▾

Búsqueda web ▾

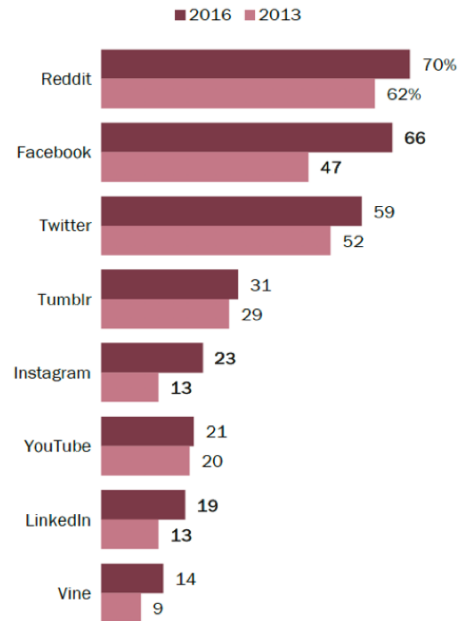
Interés por región 



New information/knowledge sources

Growth in use of social media for news

% of users of each social networking site who get news there



Note: Statistically significant differences in bold.
 Source: Survey conducted Jan. 12-Feb. 8, 2016.
 "News Use Across Social Media Platforms 2016"

PEW RESEARCH CENTER



Is the Media Outlet's Science Coverage Driven Mostly by Evidence?



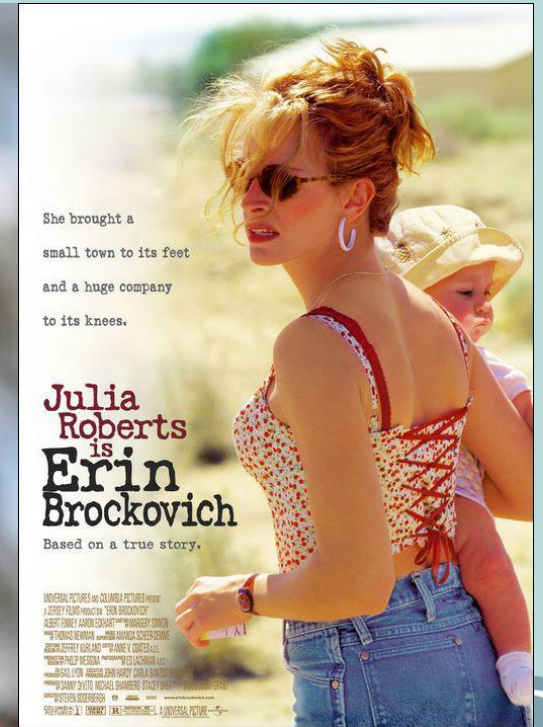
Created by:  AMERICAN COUNCIL ON SCIENCE AND HEALTH  RealClear Science

4

Industry is not Mother Teresa



Erin Brockovich vs. PG&E



Chinese infant formula with melamine





http://www.occupyforanimals.net/uploads/7/7/3/5/7735203/__3398737.jpg



5

Science, sensationalism and speculation



Chemophobia

Irrational fear to compounds perceived as synthetic



<https://blog.spotchemi.com/wp-content/uploads/2017/01/chemophobia-chemical-industry-markets.png>



Food Chemophobia

- Fear to certain food additives and ingredients
- Based on the idea of being artificial, unnecessary and unhealthy



- “Don't buy products with more than five ingredients or any ingredients you can't easily pronounce”



<http://www.barclayagency.com/public/uploads/SBA-Speaker-Photo-Pollan.jpg>

Michael Pollan
The Omnivore's Dilemma, 2006
In defense of food, 2008



AN ALL-NATURAL STRAWBERRY



INGREDIENTS: AQUA (90.9%), **SUGARS (4.9%)** (FRUCTOSE (50%), GLUCOSE (41%), SUCROSE (9%)), FIBRE E460 (2.0%), ASH, **FATTY ACIDS (<1%)** (OMEGA-6 FATTY ACID: OCTADECADIENOIC ACID (42%), OMEGA-3 FATTY ACID: OCTADECATRIENOIC ACID (31%), OCTADECANOIC ACID (20%), HEXADECANOIC ACID (6%), OCTADECANOIC ACID (1%), HEXADECANOIC ACID (<1%)), **AMINO ACIDS (<1%)** (ASPARTIC ACID (26%), GLUTAMIC ACID (17%), LEUCINE (6%), ALANINE (6%), LYSINE (5%), GLYCINE (5%), ARGININE (5%), PROLINE (4%), SERINE (4%), TYROSINE (4%), THREONINE (4%), ISOLEUCINE (3%), PHENYLALANINE (3%), VALINE (3%), HISTIDINE (2%), TRYPTOPHAN (1%), CYSTINE (1%), METHIONINE (<1%)), **PRESERVATIVES** (E236, E296) **COLOURS** (E160a, E161b, E161c, E140, E161d, E161e, E161g, E161h) E300, E307, FOLATE, CHOLINE, BETAINE, PHYTOSTEROLS, **FLAVOURS** (2,5-DIMETHYL-4-HYDROXY-2H-FURAN-3-ONE, 2,5-DIMETHYL-4-METHOXY-2H-FURAN-3-ONE, GAMMA DECALACTONE, GAMMA-DODECALACTONE, 2-FURFURAL, 5-HYDROXY METHYL-FURFURAL, LIMONENE, LINALOOL, (E)-NEROLIDOL, E1510, HEXANOL, OCTANOL, METHYL BUTANOATE, ETHYL BUTANOATE, METHYL HEXANOATE, ETHYL HEXANOATE, HEXYL ETHANOATE, (E)-2-HEXEN-1-YL ETHANOATE, BUTYL ETHANOATE, METHYL OCTANOATE, ETHYL OCTANOATE, OCTYL-2-METHYL BUTANOATE, OCTYL HEXANOATE, DECYL BUTANOATE, DECYL ETHANOATE, METHANETHIOL, ETHYL 3-METHYLBUTANOATE, GERANIOL, E210, FARNESYL ACETATE, MESIFURANE, METHYL ANTHRANILATE, GAMMA-DECALACTONE, METHIONAL, DIMETHOXYMETHANE, 1-BUTOXY-1-ETHOXYETHANE), 2-(4-HYDROXYPHENYL)-ETHYL BETA-D-GLUCOPYRANOSIDE.





OPEN ACCESS

Consumption of ultra-processed foods and cancer risk: results from NutriNet-Santé prospective cohort

Thibault Fiolet,¹ Bernard Srour,¹ Laury Sellem,¹ Emmanuelle Kesse-Guyot,¹ Benjamin Allès,¹ Caroline Méjean,² Mélanie Deschasaux,¹ Philippine Fassier,¹ Paule Latino-Martel,¹ Marie Beslay,¹ Serge Hercberg,^{1,4} Céline Lavalette,¹ Carlos A Monteiro,³ Chantal Julia,^{1,4} Mathilde Touvier¹

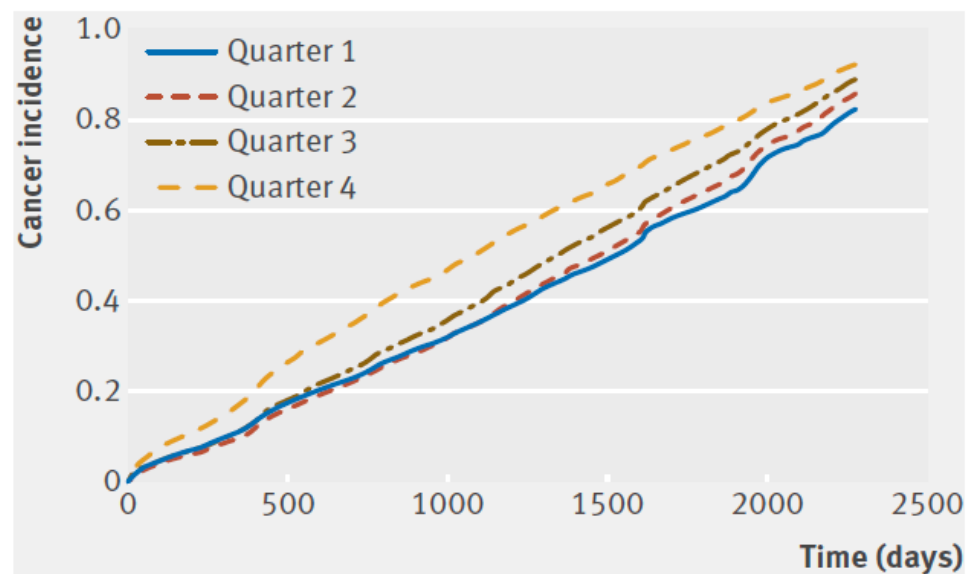
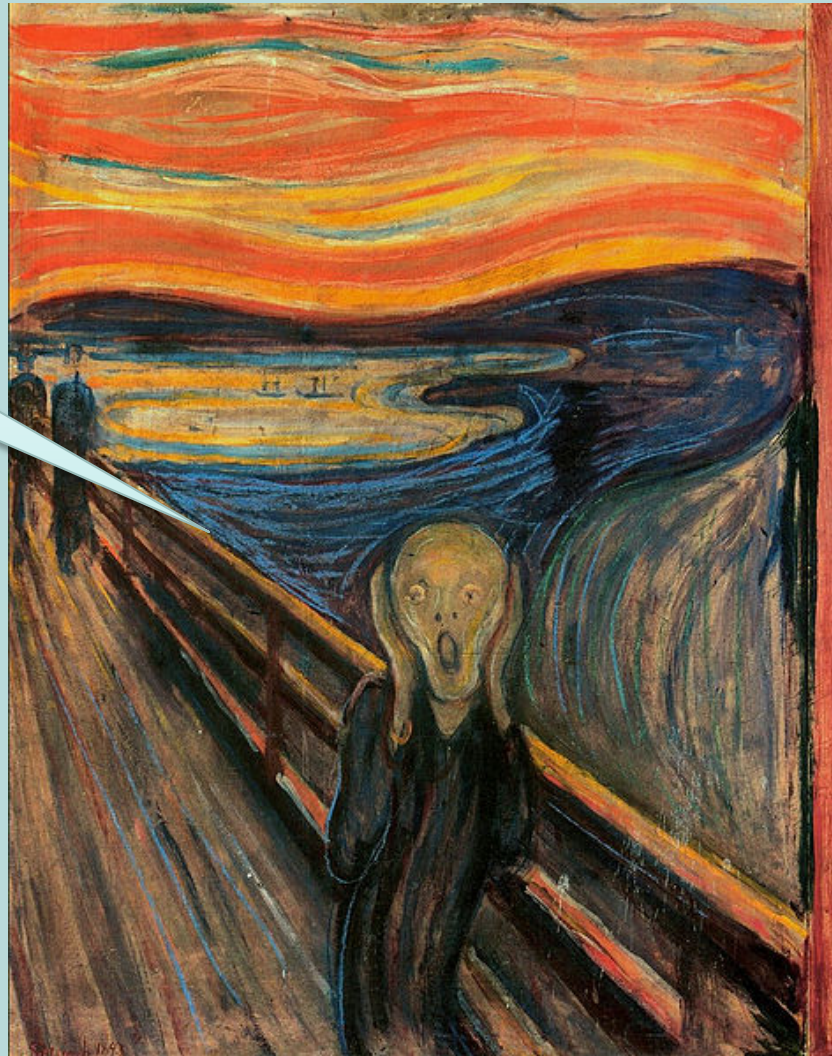


Fig 2 | Cumulative cancer incidence (overall cancer risk) according to quarters of proportion of ultra-processed food in diet



Food
consumer

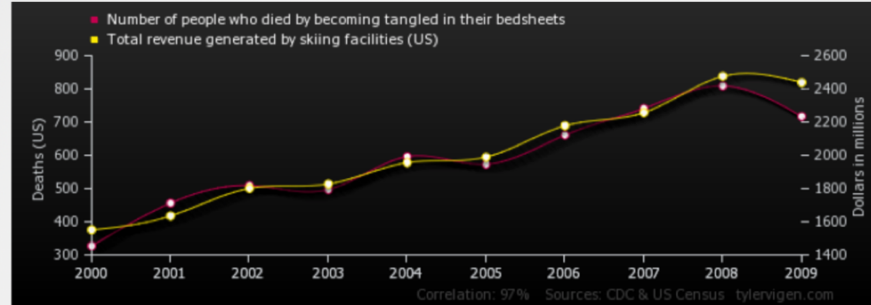


http://marisolroman.files.wordpress.com/2012/11/475px-the_scream1.jpg



spurious correlations

Number of people who died by becoming tangled in their bedsheets
 correlates with
 Total revenue generated by skiing facilities (US)



[Upload this image to imgur](#)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Number of people who died by becoming tangled in their bedsheets Deaths (US) (CDC)	327	456	509	497	596	573	661	741	809	717
Total revenue generated by skiing facilities (US) Dollars in millions (US Census)	1,551	1,635	1,801	1,827	1,956	1,989	2,178	2,257	2,476	2,438

Correlation: 0.969724

[Permalink](#) - [Mark as interesting \(19,057\)](#) - [Not interesting \(6,016\)](#)

[View all correlations](#) - [Discover a new correlation](#)

[Re-Chart](#)



Reasons to
Never Eat Processed Foods
 again

Loaded with
pesticides

The Most Processed Meats on the Market



Sausage



Bacon



It's still legal to feed cattle the remains of other animals, including the blood of other cows. This practice allows illnesses to enter the food chain, and may lead to Bovine Spongiform Encephalopathy or Mad Cow Disease.



Hot dog



Hamburger

Destroy your mind



1 in 3
 CHILDREN
 OVER
 WEIGHT



33%
 WATCH
 THAN 3
 HOURS TV



50%
 EAT
 VEGETABLES



1/3 MEALS
 FAST FOOD



30%
 HEALTH
 COST

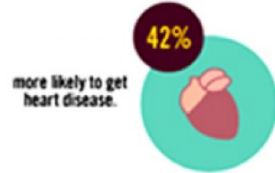


1 IN 10
 CHILDREN ARE
OBESE

\$ More expensive

Processed foods are
 not actually food

Eating 2 Ounces of Processed Meat a Day Means You Are:



more likely to get
 heart disease.



more likely to get
 diabetes.



Indignation

One main reason for the penetration of ultra-processed products in the Global South are the prevailing dominant political and economic policies that, since the 1980s, have promoted the flow of international capital and trade, foreign entry into national markets, and market deregulation. These policies have enabled the rapid rise of transnational food manufacturing, distribution, catering, and retail corporations

Ultra-processed food and drink products in Latin America: Trends, impact on obesity, policy implications



Indignation

Public Health Nutrition: 12(5), 729–731

doi:10.1017/S1368980009005291

Invited commentary

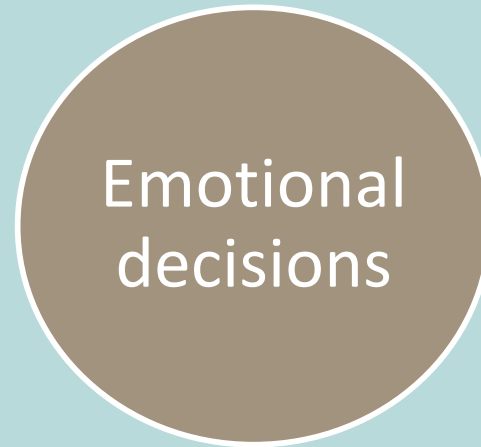
Nutrition and health. The issue is not food, nor nutrients, so much as processing

Modern and sophisticated food marketing strategies are concentrated on ultra-processed products such as soft drinks, burgers and biscuits, not on minimally processed foods like traditional staples such as grains and legumes, or even on oil and sugar. The reason is well-known. Ultraprocessed foods and drinks are very profitable. Their ingredients may cost the manufacturer a mere 5–10% of the product's retail price, and in the case of 'premium' products, even less





+



6

Science is not enough





Science is not enough, religion is not enough, art is not enough, politics and economics are not enough, nor is love, nor is duty, nor is action however disinterested, nor, however sublime, is contemplation. Nothing short of everything, will really do.

— *Aldous Huxley* —

AZ QUOTES

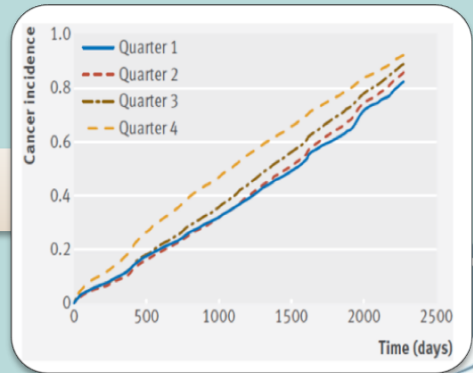




SCIENCE
Logical thinking

CONSUMERS
Emotional thinking





• BAD SCIENCE •

1. SENSATIONALISED HEADLINES



Headlines of articles are commonly designed to entice viewers into clicking on and reading the article. At best, they over-simplify the findings of research. At worst, they sensationalise and misrepresent them.

2. MISINTERPRETED RESULTS



News articles sometimes distort or misinterpret the findings of research for the sake of a good story, intentionally or otherwise. If possible, try to read the original research, rather than relying on the article based on it for information.

3. CONFLICT OF INTERESTS



Many companies employ scientists to carry out and publish research - whilst this does not necessarily invalidate research, it should be analysed with this in mind. Research can also be misrepresented for personal or financial gain.

4. CORRELATION & CAUSATION



Be wary of confusion of correlation & causation. Correlation between two variables doesn't automatically mean one causes the other. Global warming has increased since the 1800s, and pirate numbers decreased, but lack of pirates doesn't cause global warming.

5. SPECULATIVE LANGUAGE



Speculations from research are just that - speculation. Be on the look out for words such as 'may', 'could', 'might', and others, as it is unlikely the research provides hard evidence for any conclusions they precede.

6. SAMPLE SIZE TOO SMALL



In trials, the smaller a sample size, the lower the confidence in the results from that sample. Conclusions drawn should be considered with this in mind, though in some cases small samples are unavoidable. It may be cause for suspicion if a large sample was possible but avoided.

7. UNREPRESENTATIVE SAMPLES



In human trials, researchers will try to select individuals that are representative of a larger population. If the sample is different from the population as a whole, then the conclusions may well also be different.

8. NO CONTROL GROUP USED



In clinical trials, results from test subjects should be compared to a 'control group' not given the substance being tested. Groups should also be allocated randomly. In general experiments, a control test should be used where all variables are controlled.

9. NO BLIND TESTING USED



To prevent any bias, subjects should not know if they are in the test or the control group. In double-blind testing, even researchers don't know which group subjects are in until after testing. Note, blind testing isn't always feasible, or ethical.

10. 'CHERRY-PICKED' RESULTS



This involves selecting data from experiments which supports the conclusion of the research, whilst ignoring those that do not. If a research paper draws conclusions from a selection of its results, not all, it may be cherry-picking.

11. UNREPLICABLE RESULTS



Results should be replicable by independent research, and tested over a wide range of conditions (where possible) to ensure they are generalisable. Extraordinary claims require extraordinary evidence - that is, much more than one independent study!

12. JOURNALS & CITATIONS



Research published to major journals will have undergone a review process, but can still be flawed, so should still be evaluated with these points in mind. Similarly, large numbers of citations do not always indicate that research is highly regarded.





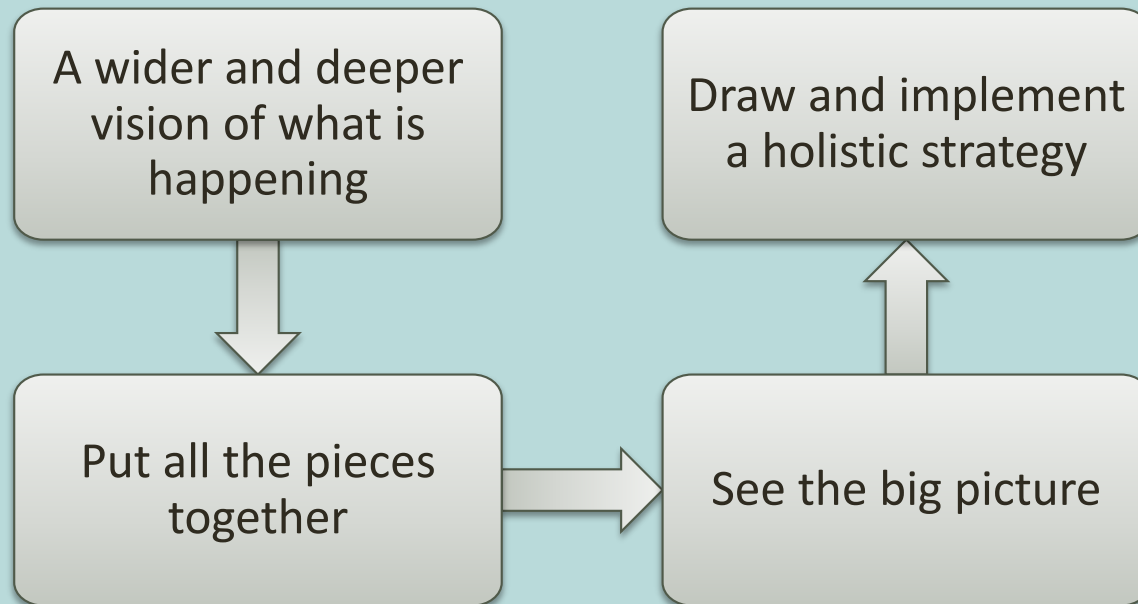
ALACCTA's Montevideo Declaration On misconceptions about processed foods

XIX Latin American and the Caribbean Seminar on Food Science and Technology

Montevideo, Uruguay, August 8th, 2016

www.alaccta.org

Science is not enough



Science is not enough

A holistic approach is required to
regain consumer trust in
processed foods

An illustration on a dark blue background. In the center, three stylized human figures in suits are shown in various poses of deep thought or concern. Behind them is a dark silhouette of a factory with smokestacks and gears. To the left, a vertical scale is visible. To the right, several small white fish are swimming. The overall scene suggests a complex, multi-faceted problem that requires a holistic approach.

Thanks

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