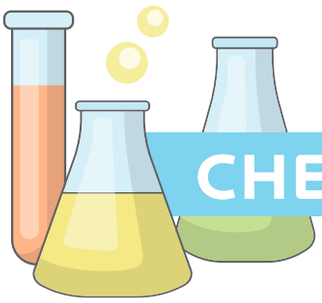
WHY NUTRITION SCIENCE IS SO CONFUSING

9 REASONS EATING WELL ISN'T AS STRAIGHTFORWARD AS WE'D LIKE IT TO BE.

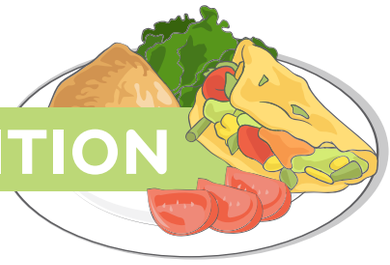
1 NUTRITION RESEARCH IS STILL YOUNG.

It takes time to master a science. Compared to chemistry, for example, nutrition is in its infancy.



CHEMISTRY

NUTRITION



<1200 BC

Metals are first recorded and manipulated.

430 BC

Greek philosophers propose the idea of the atom.

300 BC

Aristotle wrongly declares the existence of only four elements.

300 BC - 300 AD

Alchemists try to transform lead and other cheap metals into gold.

1520

Alchemists try to make the elixir of life.

1774-1794

Joseph Priestley discovers "dephlogisticated air" (oxygen).

LATE 1700S

Robert Boyle disproves alchemy and Aristotle's four elements.

MID-1800S

Chemistry becomes a science: Discoveries include protons, X-rays, fluorescence, electrons, radioactivity, atomic mass, relative molar mass, and more.

MID-1900S

Molecular biology and biochemistry come into being with discovery of DNA.

1842

Scurvy is successfully treated for the first time.

MID-1800S

Researchers realize that the body oxidizes fat and carbohydrates for energy.

1902

Wilbur Atwater publishes his "Atwater factors" – estimates for the metabolizable energy from carbohydrates, protein and fat in mixed diets.

EARLY 1900S

Vitamin A, B, C, D and E, B5, B6, B3, K, and folate are discovered.

1970S

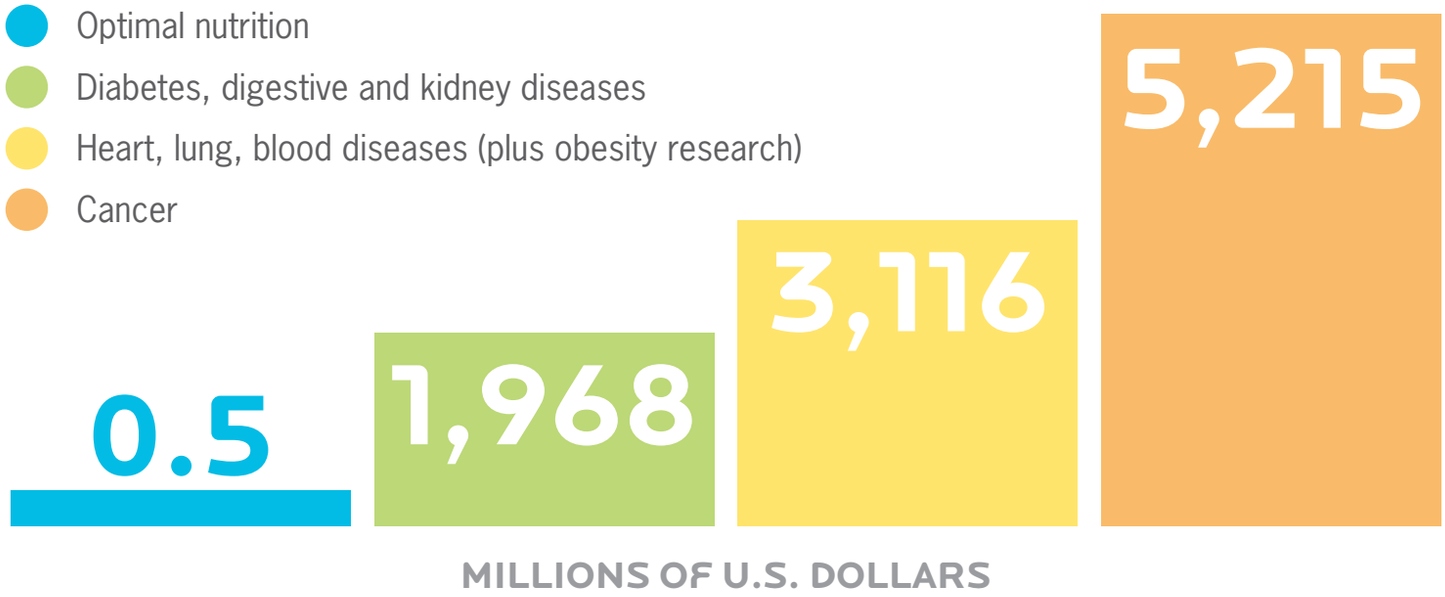
Researchers discover the link between risk of coronary heart disease death and low HDL cholesterol level.

As you can see, the field of chemistry has been around at least 10X longer than the field of nutrition — and it made almost no progress in its first 200 years. By this comparison, one could say the field of nutrition is in its "alchemy days".

2 MOST FUNDING GOES TO DISEASE TREATMENT, NOT PREVENTIVE NUTRITION.

Most researchers would rather ask, "How can we end this epidemic?" than, "How can we get abs?"

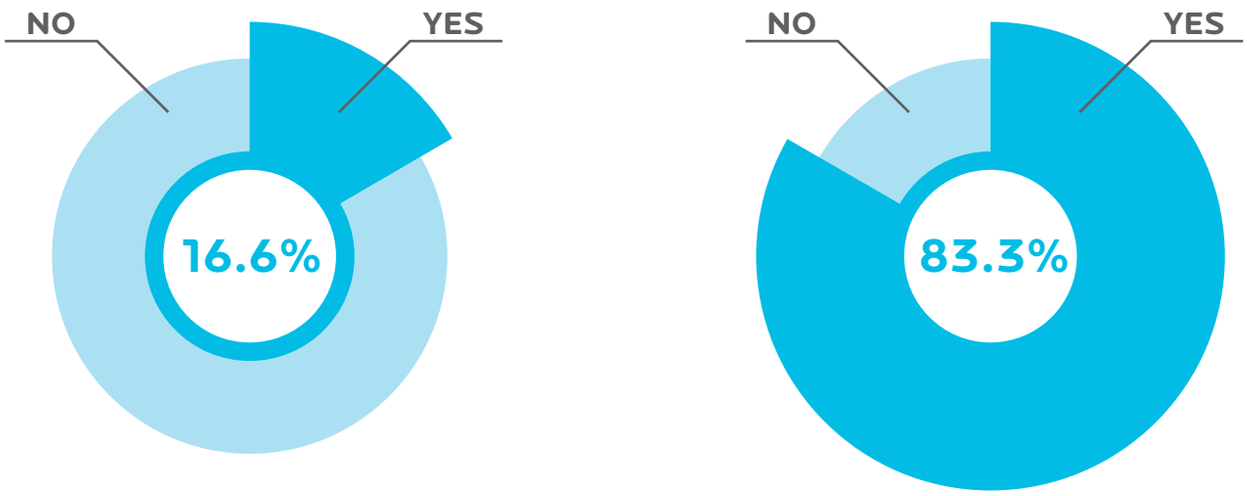
2016 U.S. NATIONAL INSTITUTE OF HEALTH FUNDING BY AREA OF RESEARCH



3 OTHER NUTRITION QUESTIONS ARE OFTEN FUNDED BY INTERESTED PARTIES.

Where funding comes from can affect what studies find.

CAN SUGARY DRINKS LEAD TO WEIGHT GAIN?



Studies WITH financial conflict of interest

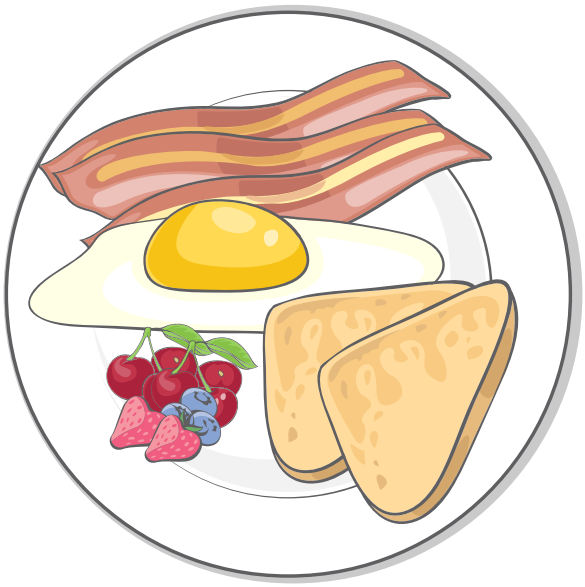
Studies with NO financial conflict of interest

This doesn't mean researchers are cheating. At the same time, corporate pressures can influence study design so that the research is more likely to show what the company wants to show.

4 CONFOUNDING VARIABLES MAKE IT HARD TO PROVE FOOD'S EFFECTS.

Even in the best controlled trial, it's hard to isolate the effects of nutrition from all the other factors that affect your health.

EPIGENETICS MICROBIOME INCOME CLIMATE
ETHNIC HERITAGE AGE CHRONIC DISEASES EDUCATION PHYSICAL ACTIVITY ALCOHOL
WHETHER AND WHEN YOU HAVE KIDS STRESS LEVEL CONSUMPTION
YOUR HEALTH
CULTURE YOU LIVE IN AGE
HOW MANY DR. OZ DIETS YOU'VE TRIED SLEEP WHO YOUR FRIENDS ARE
HORMONES GENETICS FOOD PREFERENCES
TRAUMAS AND AVERSIONS GENDER
SMOKING ADDICTIONS MENTAL HEALTH



PARTICIPATION IN A STUDY CAN ITSELF BECOME A CONFOUNDING VARIABLE.

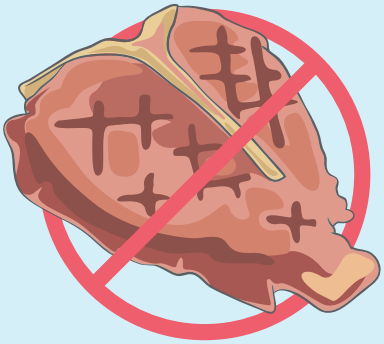
For example, when scientists asked subjects who normally eat breakfast to stop, and asked non-breakfast eaters to start — both groups lost weight. It was the dietary change that created weight loss, not breakfast.

5 MOST NUTRITION STUDIES ARE OBSERVATIONAL.

Observational studies have subjects fill out questionnaires about their lifestyle and eating habits. This is a problem because:

People are terrible at remembering what or how much they ate. Quick! What did you eat for breakfast two Tuesdays ago? Exactly.

There are a lot of weird (and meaningless) correlations. One research group found that organic food sales are correlated with autism.

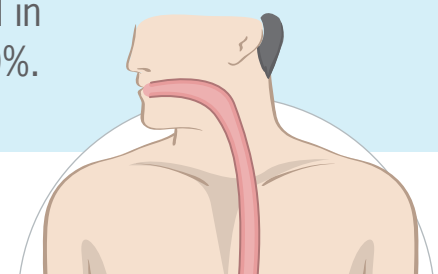


Correlation isn't causation.
Does red meat cause heart disease and cancer, or do people with these chronic diseases happen to eat more red meat? Since an observational study can't account for all variables, it can't answer this question.

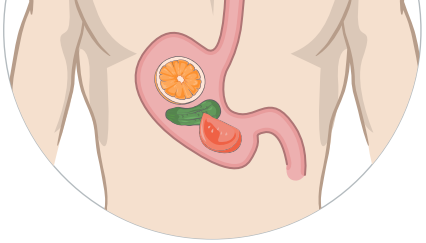
6 MEASUREMENT TOOLS ALWAYS HAVE LIMITATIONS.

For example, even with a straightforward question like, "How do calories affect our weight?" it's hard to get an answer, because:

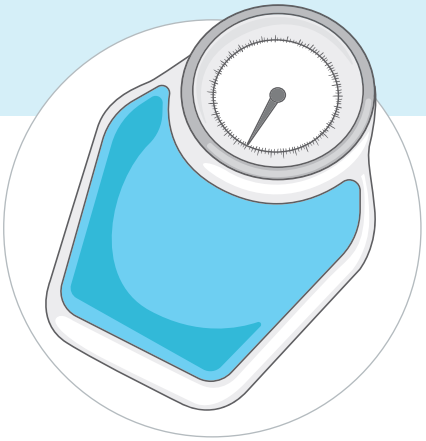
Calorie counts on food labels and in databases can be off by up to 50%.



We don't absorb all of the energy we consume, and there's no standard for how much energy we absorb, because individuals are unique.



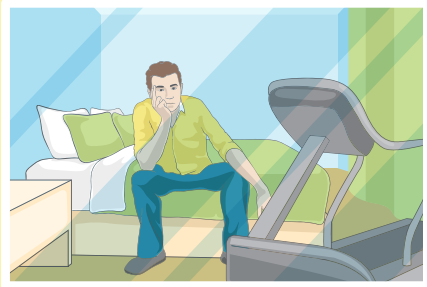
Calorie burn estimates can be off by 3 - 45%.



Your history of dieting and body composition influences how much energy you'll use.

7 WHAT YOU EAT DOESN'T AFFECT YOUR HEALTH RIGHT AWAY.

For example, to find out whether red meat causes cancer, you'd need study subjects to live in hermetically sealed metabolic chambers and eat varying amounts of red meat for 30 years. Who's going to sign up for that?



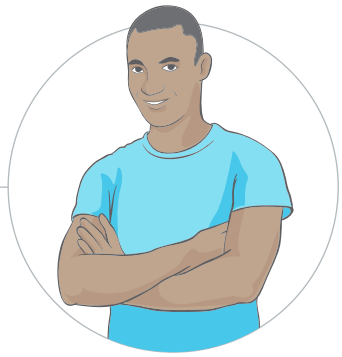
8 YOU CAN NEVER ASSUME A STUDY'S FINDINGS APPLY TO YOU.

Even if you *could* seal people in a metabolic chamber for 30 years, you *still* couldn't be sure who else those findings would apply to.

FIRST, NUTRITION STUDIES TEND TO USE SUBJECTS WHO DON'T MATCH THE GENERAL POPULATION. THEY'RE OFTEN...

YOUNG AND HEALTHY

Grad students are popular subjects since they live near academic study labs, have time, and need a paycheck.



MALE

Men are easier to study than women, whose hormonal cycles are hard to control for.

SICK

Subjects suffering from problems like obesity, metabolic syndrome, and/or hypertension help researchers develop treatments.

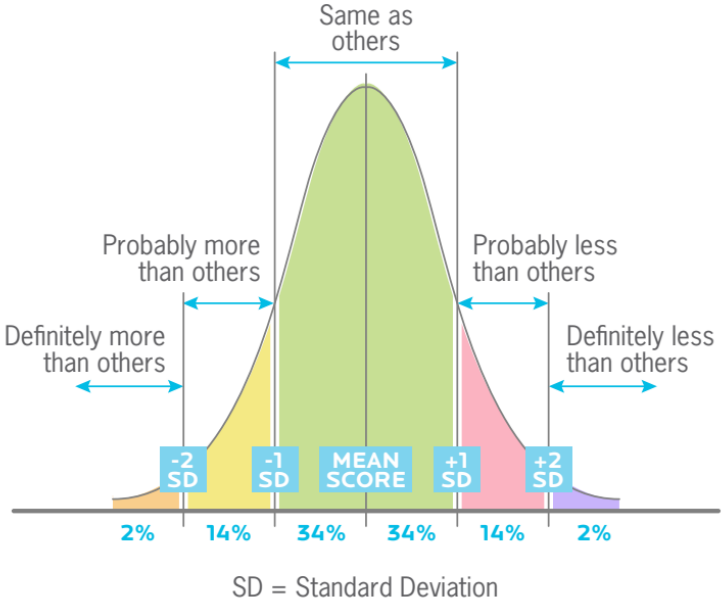
ULTRA FIT

Elite athletes' excellent physical condition minimizes variables and makes hours of exercise in the lab possible.

NON-HUMAN

Animals are captive and have short lifespans, making them convenient and cheap to study.

SECOND, STUDY AVERAGES STILL MAY NOT APPLY TO YOU, BECAUSE...



AVERAGES ARE BELL CURVES.
Most people won't match averaged study findings (at least not precisely).

AVERAGES POOL UNLIKE SUBJECTS.
For example, a study where subjects metabolize caffeine either quickly or slowly could mistakenly show no effect of caffeine on health when 1/2 the subjects had a positive effect and 1/2 a negative one.

9 IF DOING THE RESEARCH IS DIFFICULT, REPORTING ON IT IS EVEN TOUGHER.

Journalists aren't usually trained research scientists. Which means they often:

- Misunderstand study conclusions.
- Over-exaggerate single study findings.
- Don't see how single studies fit into the big picture.

Individual studies are interesting but not often important. They usually provide only one tiny piece of a gigantic puzzle that may take thousands of years to complete.

*For more information, and supporting materials, visit:
http://www.precisionnutrition.com/nutrition-science-is-so-confusing

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