

PRECISION NUTRITION  
**VIDEO COURSE**

LESSON 2  
THE KEY PRINCIPLES  
OF ENERGY BALANCE

**PART 1**  
**CALORIES**  
**IN**





# THE SURPRISING PROBLEM WITH CALORIE COUNTING

## Part 1: 'Calories In'

By John Berardi Ph.D. and Helen Kollias Ph.D.

Most people who count calories for weight loss or weight management assume it's an exact science. It's not. Here we outline 5 reasons calorie counting (i.e. logging your food to calculate intake) is fundamentally flawed.

## Make no mistake, the principles of energy balance work:

*Take in more calories / energy than you expend, you gain weight.  
Take in fewer calories / energy than you expend, you lose weight.*

However, *counting* calories as a way to try to know, and control, your energy intake is fundamentally — sometimes hopelessly — flawed.

For starters, you can't really trust that the calorie (and macronutrient) numbers you see on food packages are accurate. You see, the way they're calculated — if they're calculated at all — is surprisingly imprecise.

Plus, even if food package numbers were precise, once the food is cooked, or chopped, or blended, the amount of energy available for digestion and absorption changes.

Then there's what happens once that food enters your body...

In the end, even something that seems as simple as knowing how many calories you're taking in (and absorbing) can be influenced by dozens of unexpected factors.

That's why, today, we share the 5 biggest (and surprising) problems with calorie counting as it relates to the "calories in" side of the energy balance equation.

# THE SURPRISING PROBLEM WITH CALORIE COUNTING

## PART 1: 'CALORIES IN'

Most people who count calories for weight management assume it's an exact science. Here, 5 reasons why tracking the calories in your food is a flawed approach.

# 1

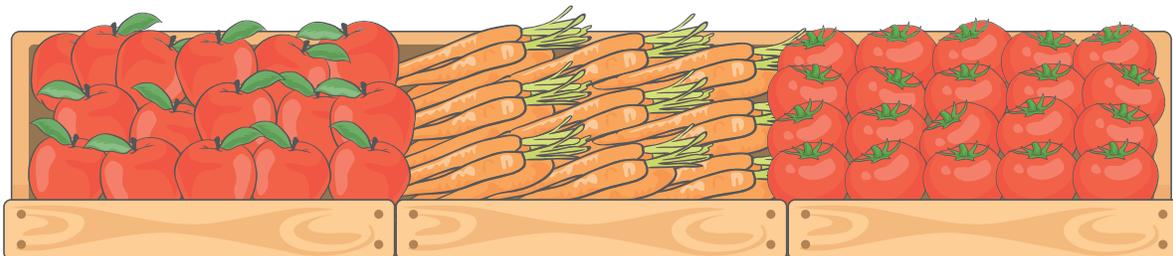
### CALORIE COUNTS ARE IMPRECISE.

The calorie counts on food labels and in databases are averages. Research shows that the true calorie content of what you're eating is often significantly higher or lower.

#### APPLES

#### CARROTS

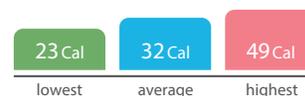
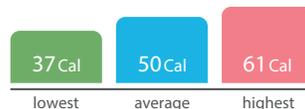
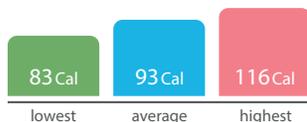
#### TOMATOES



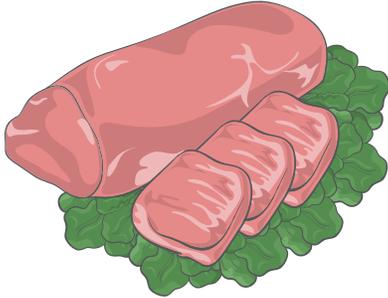
1 medium apple

1 cup carrot sticks

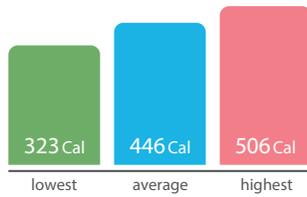
1 cup chopped tomato



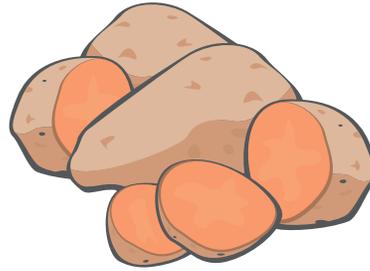
## LEAN BEEF LOIN



1 6-oz filet mignon



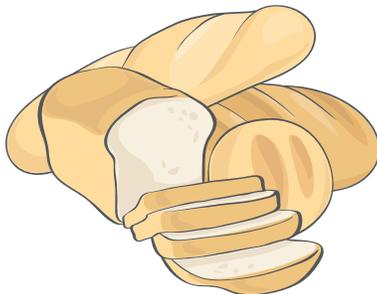
## SWEET POTATO



1 large sweet potato



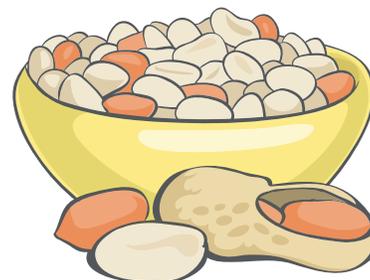
## WHITE BREAD



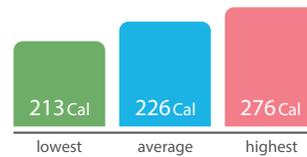
1 slice of bread



## PEANUTS



1/3 cup chopped peanuts





Food companies may use any of 5 different methods to estimate calories, so the FDA permits inaccuracies of up to 20%.

So "150 calories" actually means 130-180 calories.

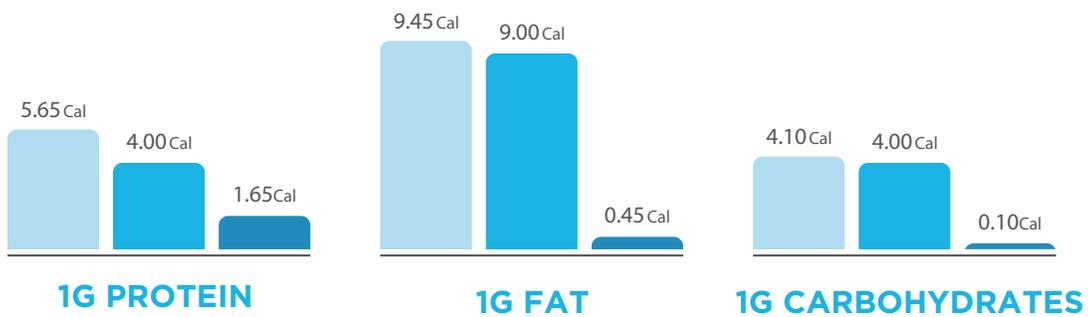
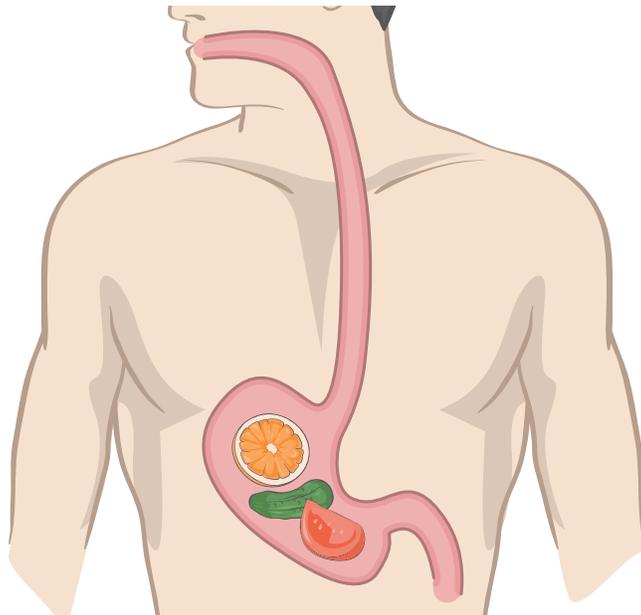
**ERROR: UP TO 50%**

# 2

## WE DON'T ABSORB ALL OF THE CALORIES WE CONSUME.

For decades, scientists have used this formula to come up with calorie counts that reflect only what we'll absorb:

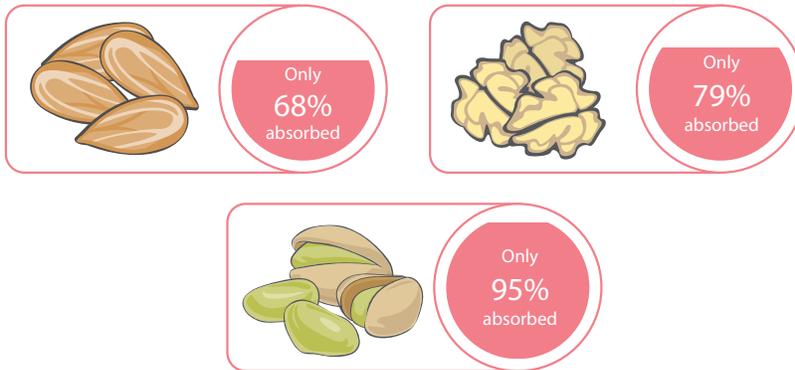
Some calories pass through us undigested, and this varies from food to food.



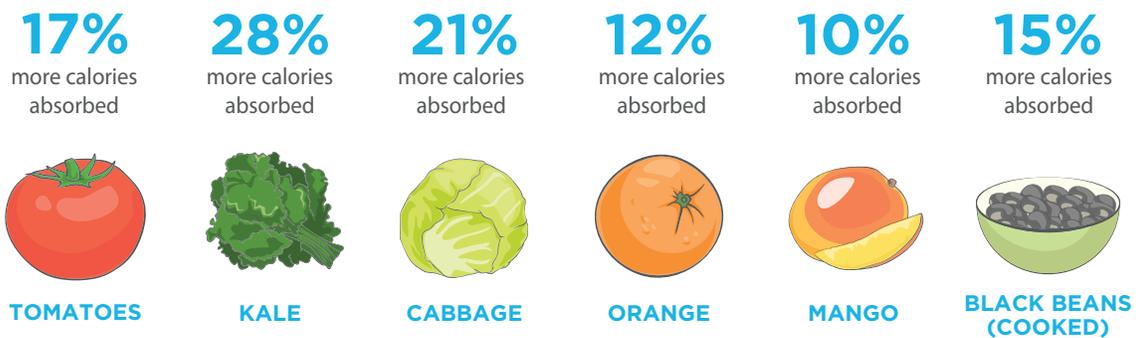
- TOTAL CALORIES PER 1 GRAM OF MACRONUTRIENT
- CALORIES AVAILABLE FOR ABSORPTION
- CALORIES NOT ABSORBED

## BUT THIS FORMULA DOESN'T TELL THE WHOLE STORY, EITHER.

For example, the formula doesn't work for nuts and seeds, because we absorb fewer calories from them than calculated.



Another example: The formula is wrong about fiber-rich foods.



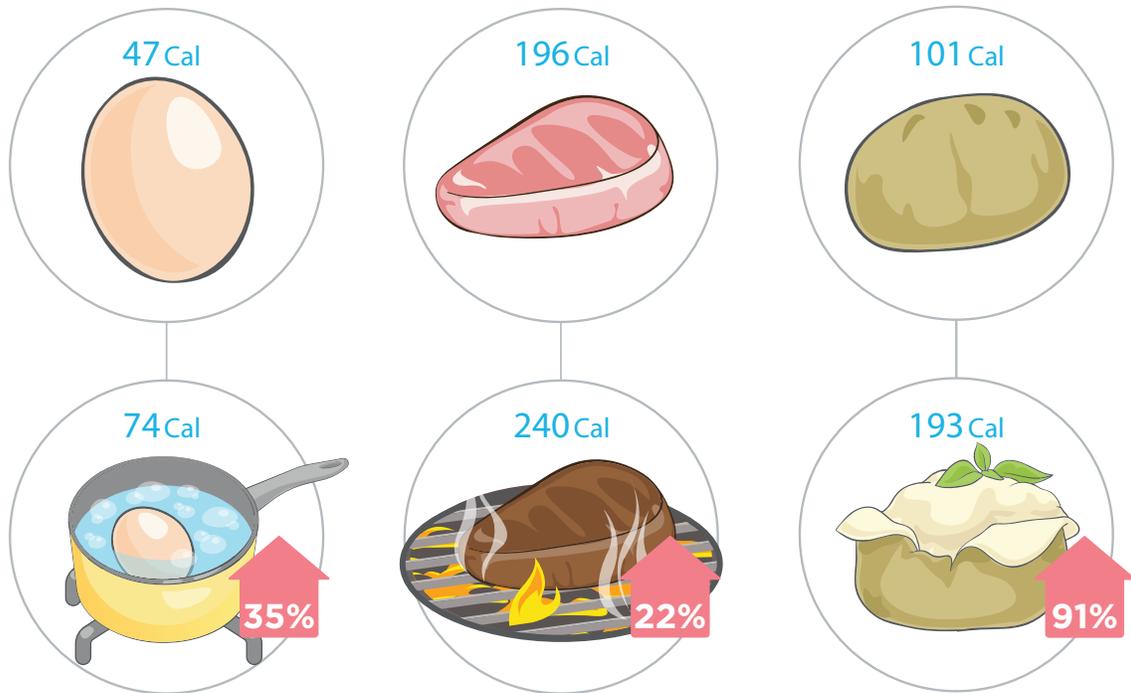
And another example: It turns out that the number of calories available for absorption from protein-rich foods is much more variable than the formula calculates.

**ERROR: 10% ON AVERAGE**

# 3

## HOW YOU PREPARE FOOD CHANGES ITS CALORIE LOAD.

Cooking your food generally makes more of the calories available for absorption, and food labels don't always reflect that.

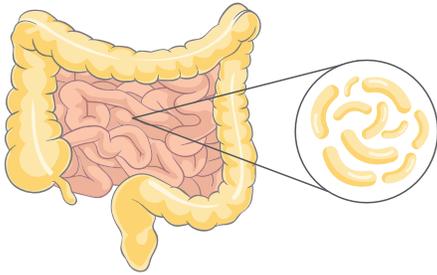


CHOPPING OR BLENDING YOUR FOOD ALSO INCREASES CALORIES ABSORBED.

**ERROR: UP TO 90%**

# 4

## INDIVIDUALS ABSORB CALORIES UNIQUELY (AND VARIABLY).



Our own individual gut bacteria can increase or decrease the calories we absorb.

People with a higher proportion of Firmicutes bacteria absorb an average of

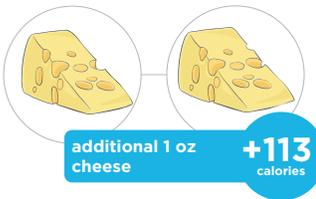
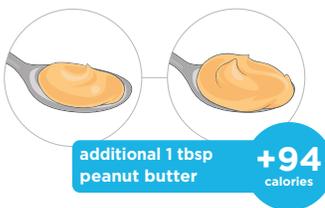
**150 PER DAY**  
calories **MORE**

than those with a higher proportion of Bacteroidetes.

# 5

## PEOPLE AREN'T GREAT AT EYEBALLING PORTION SIZES.

Studies show that people mis-measure portions about two thirds of the time, so it's easy to accidentally consume a lot more calories than you intend to.



## PUTTING IT ALL TOGETHER

### Because...

Calorie counts are imprecise;  
We don't absorb all of the calories we consume;  
How you prepare food changes its calorie load;  
Individuals absorb calories uniquely and variably; and  
People aren't great at eyeballing portion sizes...

**...calorie counting may not be worth the work.**

TOTAL ERROR WHEN COUNTING 'CALORIES IN':  
**UP TO 25%**



## SO, WHAT'S THE SOLUTION?

For a much easier portion  
measurement system, see

**The Surprising Problem  
with Calorie Counting, Part 2**

# Some important notes

## Lowercase ‘c’

For the scientists among our readership: Throughout the introduction and infographic, ‘calories’ — lowercase ‘c’, refers to kilocalories — or ‘Calories’. Over time, popular language has lost the big C/little c distinction.

## Section 1: “Calorie counts are imprecise.”

In 1896, Wilbur O. Atwater, the father of food calories, sampled hundreds of specimens of food products collected at the World’s Fair. Atwater calculated the caloric value of each food using bomb calorimetry, a very accurate and precise method for measuring total energy in any object.

Interestingly, a wide range of total caloric values was found, even for single food types (i.e. apples) bred, picked, and stored identically. As a result, the Food and Agriculture Organization of the United Nations said in a statement:

“Foods, being biological materials, exhibit variations in composition; therefore a database cannot accurately predict the composition of any given single sample of food.”

Even more interesting: Atwater’s total caloric ranges were used to produce the kcal averages still in use on labels and in databases today. (They’re over 100 years old!) For a given food these values could be up to 50% off, as outlined in the infographic.

Bottom line: The trust many of us feel that calorie labels and nutrient databases are exact (or even accurate and reliable) may be misguided.

## Section 2: “Calorie counts that reflect only what we’ll absorb.”

The averages of 4 kcals per gram of protein, 9 kcals per gram of fat, and 4 kcals per gram of carbohydrates — meant to reflect how much energy we actually absorb from food since these values are lower than the energy measured in the food — are Atwater general correction factors developed in 1897 and are still in use today.

Subsequently it’s been discovered that carbohydrates high in fiber have different correction factors, depending on the type of fiber (and even your gut bacteria / microbiota).

It’s also been discovered that energy absorption from protein varies. Typical absorption from animal protein is higher than the general Atwater factor — for example, 4.36 kcals per gram of protein in eggs — and lower from most vegetables — generally 2.44 kcals per gram of protein. The revised absorption averages are called Atwater specific correction factors.

Calories on food labels usually use the general factors while the USDA database uses the specific factors.

Further complicating the question of absorption, a new correction factor was developed to take into account the energy burned through digestion of various macronutrients.

Livesey's Net Metabolizable Energy values are:

- protein, 3.2 kcals per gram;
- fat, 8.9 kcals per gram;
- available carbohydrates, 3.8 kcals per gram; and
- fermentable carbohydrates, 1.9 kcals per gram.

Bottom line: The idea that a gram of any protein yields 4 kcal, a gram of any fat yields 9 kcal, and a gram of any carbohydrate yields 4 kcal is a gross oversimplification that could have significant implications when trying to control and balance calorie intake.

## **Section 5: “People aren’t great at eyeballing portion sizes.”**

Research shows that people are generally terrible at estimating caloric intake. Even trained nutritionists underestimate calories in meals by an average of 30 percent.

We often get the portion sizes wrong too. When trying to serve ourselves 1 tablespoon of, say, peanut butter, we often end up getting much more than an actual tablespoon. And it doesn't just happen once in awhile... it happens most of the time.

## Want to learn more?

If you'd like to learn more about helping people find the best way of eating for them, check out our [Precision Nutrition Level 1 Certification](#) program; the next group kicks off soon.

The Precision Nutrition Level 1 Certification is the world's most respected nutrition education program. It gives you the knowledge, systems, and tools you need to *really* understand how food influences a person's health and fitness. Plus the ability to turn that knowledge into a thriving coaching practice.

Developed over 15 years, and proven with over 100,000 clients and patients, the Level 1 curriculum stands alone as the authority on the science of nutrition and the art of coaching.

Whether you're already mid-career, or just starting out, the Level 1 Certification is your springboard to a **deeper understanding of nutrition**, the **authority to coach it**, and the **ability to turn what you know into results**.

Visit this link for more information:

<http://get.pn/level-1>

[Of course, if you're already a student or graduate of the Level 1 Certification, check out our [Level 2 Certification](#), an exclusive year long Master Class for elite professionals looking to take their nutrition knowledge and coaching techniques to the highest possible level.]