

Gobble, Gobble, Zzzz...

A common Thanksgiving mystery is why after eating loads of turkey do we feel so tired? This week, we will finally answer this age-old question.

PRACTICAL SCIENCE WITH PHIL FREDA

On Thursday, we Americans will stuff our faces to a point that we have awaited all year.

Probably the most common Thanksgiving fare includes stuffing, mashed potatoes, cranberry sauce, and of course – Turkey!

If you're like me, you load up on all of these tasty treats, find a nice open space on a big comfy couch and stare at the TV, wondering why you just ate so much food until you quietly pass out.

Why does this happen?

Is it really because of turkey, or is there some other explanation as to why we feel so tired after Thanksgiving dinner?

The #1 Suspect

In [turkey](#), and many other meats, there is an amino acid known as [tryptophan](#).

Tryptophan is one of the twenty [amino acids](#) that are found in living things.

Amino acids are the building blocks of [proteins](#) and are very important parts of our cellular machinery.

According to [National Geographic](#), purified tryptophan is a mild sleep-inducing agent.

According to [About.com](#) and [Scientific American](#), tryptophan is a precursor for both [serotonin](#) and [melatonin](#).

Both of these [neurotransmitters](#) are involved in sleep regulation by altering the brain's chemistry and inducing a calming effect.

So that's it! We solved the mystery!

Not exactly.

Turkeys Don't Work Alone

It's true that turkey has a high concentration of tryptophan when compared to other sources, but tryptophan itself is very hard to be absorbed when ingested with other amino acids.

The human body is not capable of synthesizing tryptophan on its own, so we need to get it from other sources.

In the case of Thanksgiving dinner, that source is the muscle of turkey.

But tryptophan is not the only amino acid found in turkey, or any high-protein food.

Animal muscle tissue contains loads of proteins and therefore, even more amino acids.

According to Scientific American, when compared to all of the other amino acids present in turkey, tryptophan is actually the scarcest. In order for these amino acids to have an effect on brain chemistry, they must be transported into the brain from the blood stream.

Proteins are relatively large organic molecules, when compared to the components of the [phospholipid bilayer \(cell membrane\)](#) of cells.

Because of their size, and electric charge, proteins cannot simply diffuse (pass through) this membrane. In order to move from the blood stream to the brain, proteins must be moved through special membrane proteins called [transporters](#).

Think of a transporter as revolving doors or turnstiles.

If you have ever seen a busy train or subway station at rush hour, you have probably witnessed hundreds of people waiting their turn to enter the turnstiles, which only allow for one passenger to go through at a time. This is very similar to how transporters operate.

Membrane transporters are specific to certain molecules. There are transporters that only allow certain sugars to pass through them or perhaps specific signaling molecules. It is no different for proteins.

The transporter that allows tryptophan to enter the cell also transports five other amino acids, according to [Scientific American](#).

Since tryptophan's concentration is in the minority to other five amino acids, it has a very hard time entering into the brain.

Since tryptophan has such a hard time entering the brain, it cannot make a significant impact on it.

[Scientific American](#) adds that if tryptophan is isolated however, it can have an effect on the brain, but since food sources always contain other amino acids in higher concentrations than tryptophan, turkey can't make you tired.

So what is the culprit?

It may be a combination of many things.

[National Geographic](#) blames the hustle and bustle involved with preparing the meal, alcohol consumption and the fact that we, on average, ingest a large amount of calories during the feast.

High calorie foods and meals can lead to a sluggish, tired state than I, and many others, call "the itis."

More energy will be required in order to digest the high amounts of fat and sugar that was eaten, leaving less energy for the rest of your body.

Current research shows, that it may be actually [dessert](#) that causes the tired feeling.

Sweets contain large amounts of carbohydrates, which cause excretion of [insulin](#).

Insulin is a hormone that allows the uptake of glucose and amino acids into bodily tissues.

According to [Scientific American](#), the presence of insulin causes tryptophan's competition with other amino acids to be lessened, allowing it to more easily enter the brain.

So it seems that in order to get rid of that sluggish post Thanksgiving dinner feeling, we have to eat less.
I think I'll just deal with it!
It's only once a year.

That being said; enjoy your time with family and friends and be safe.
Happy Thanksgiving!

About this column: An educational, science-minded column