

Journal of Interdisciplinary Science Topics

How Many Spiders Would Spiders Georg Have To Eat?

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12/04/2024

Abstract

Spiders Georg is a known internet meme that discusses statistical outliers skewing the mean and comments on the myth that people will swallow 8 spiders in their sleep every year. This paper will be looking in to the number of spiders that he would have to eat in order for this to be true, in comparison to the world population and the possible health implications of this.

Keywords: *Meme; Biology; Nutrition; Spiders Georg*

Introduction

The myth that you will swallow 8 spiders in your sleep goes back a long way; a Guardian article from 1999 states it as a piece of trivia [1] but it can possibly even be traced back to a book about insect folklore from 1954 [2]! It has been disproven multiple times since then, however, it is still something that can concern people if they are not aware of that.

On 9th January 2013, Tumblr user *reallyreallyreallytrying*, also known as Max Lavergne, made a post on the blogging site joking that the factoid was influenced by one person, Spiders Georg, who lives in a cave and eats nothing but spiders, and that he is an outlier and should not be counted [3, 4]. This meme spread across platforms and integrated itself into online vocabulary, with the format of the post being used for a range of other situations discussing outliers or unusual statistics, with the lack of capitalisation and the 'adn' typo always preserved from the original post.

Various Reddit posts have showed users doing maths for the meme [5, 6, 7], though the majority of this focusses around Spiders Georg being a statistical outlier or simply the total number of spiders and feasibility of it rather than any nutritional effects of eating that number of spiders.

Will You Swallow Spiders?

Despite the myth, you are actually very unlikely to ever accidentally swallow a spider in your sleep, let alone 8 per year. Though they are small and likely to be active at night, spiders do not want to end up in your mouth any more than you want them in there! The majority of

people sleep with their mouths closed, so a spider wouldn't be able to enter, and they are likely to be scared off by the size of humans and the vibrations from breathing, which they are more sensitive to. Even if a spider were to get in to your mouth while sleeping, you would be unlikely to actually swallow it, as humans swallow infrequently in their sleep and there is a high chance of waking up if you felt movement in your mouth [8].

Despite this, there are likely to be some spiders eaten by humans across the world without Spiders Georg's effect on the statistics. Between the occasional spider actually being swallowed during sleep, instances of children eating spiders as dares and certain species of spider being a common food in some cultures, Spiders Georg is not going to be accounting for every single spider consumed. He is, however, going to be responsible for the significant majority of them.

The Calculations

There is a difference between the number of spiders the myth states every person will swallow in their sleep (8 per year) and the number the meme says (3 per year). Since this paper is focussing on the meme, we will be using the value of 3 spiders per person per year for all calculations.

Spiders Georg is stated to live in a cave, so ideally we would be focussing on cave spiders for any measurements and calculations. Unfortunately, there is limited information available about many specific species of spiders; the European Cave Spider was planned to be taken as an example throughout this

paper, but due to the data available, some similar substitutions have been made throughout.

On the day the post was made, the world population was 7,252,764,262 [9]. That would mean that Spiders Georg would have to eat approximately 2.176×10^{10} spiders per day. On the 10-year anniversary of the post, in 2023, the world population was 8,047,118,115 [9]. This means that Spiders Georg would now have to be eating 2.414×10^{10} spiders per day, which isn't a significant increase compared to the number he was already eating, but is still an additional amount.

There is surprisingly little nutritional information available for spiders; every source links back to the Bay Area Bug Eating Society's values for 'Very Large Spiders'. This means the values will not be completely accurate, as this information is intended to be taken for eating larger spiders, and likely more dangerous ones as the title specifically states to remove fangs, however, the basic biological structure should be relatively similar and can therefore be used as a sufficient estimate. The page states that a spider contains 90 kcals, 10g of fat and 63g of protein per 100g [10], and it can be assumed that any other nutritional components of spiders would be nutrients that a human body is unable to process.

Using estimates of spiders compared to the size of the European Cave Spider [11], the Ground Spider is of a similar size [12] and has a known weight of 0.002g [13]. The Ground Spider is also good to be taken as an example as the Spotted Ground Spider, which has the most data available for, is native to Australia, where the author of the post is from. This means that one spider can be calculated, using the values in the previous paragraph, to give 0.18 kcals, 0.02g of fat and 0.126g of protein.

When scaled up, this can be used to calculate that in 2013, Spiders Georg would have consumed 3.917×10^9 kcals, 4.352×10^8 g of fat and 2.742×10^9 g of protein. Per day, this means he would have consumed 1.073×10^7 kcals, 1192 kg of fat and 7512 kg of protein. With this perspective it is abundantly clear that Spiders Georg would not be capable of this. There is limited information about if you were to consume that great of an excess of calories, but one Reddit post discussing it makes the comparison to funnelling kilograms of pure fat (the macronutrient with the highest calorie content per gram), in this case, it would be equivalent to 1000 kg [14]. That amount would simply not fit in a person's stomach or be capable of being processed, they would likely have extreme vomiting, diarrhoea or both in the

body's attempt to remove it. With the strain this would put a person's body under, it would be likely that they would die fairly quickly. He would have to consume even more in 2023 to match the population increase, 1.448×10^7 kcals, though no further calculations or considerations would be required to see that that is even less possible.

For a more reasonable consideration, if Spiders Georg only ate 10,000 spiders per day, the number stated in the meme, that would only be 1800 kcals, 200 g of fat and 1260 g of protein, which is a (comparably) more reasonable diet. The calories in this would likely be slightly under his daily requirements, though he is likely to be fairly sedentary so probably not by much, but the amounts of protein and fat in this diet are considerably above the recommended.

It is recommended that adults consume no more than 35% of their daily calories as either fat or protein [15], though this does assume that some calories would be coming from carbohydrates which in this case they are not. This would be no more than 630 kcals in Spiders Georg's case; 70 g of fat or 157.5 g of protein.

Consuming significantly more than the recommended amount of protein can put you at risk of kidney stones and kidney failure, and the lack of fibre increases risk of heart disease and stroke [16]. The effects of an excess of fats largely depends on what type of fats they are, which we do not have the information for, but any significant excess will also put you at a great risk of heart disease and stroke [17]. This would be putting a lot of strain on to his body, so these factors, as well as a lack of other nutrients from his diet and lack of sunlight due to primarily living in a cave, would have him suffering severe physical effects and likely dying in a relatively short amount of time anyway.

Conclusion

If attempting to eat enough spiders to singlehandedly bring the mean to 3 spiders per person per year, Spiders Georg would be simply unable to achieve it or would quickly meet an unpleasant death due to the sheer amount he is attempting to consume. If the amounts were scaled down to match the 10,000 spiders per day as given in the post, he would suffer noticeable physical effects from this diet but would at least survive long enough to reduce the world's spider population by a large amount. If this situation is implying that there is a person out there who is capable of eating this much food, spiders or otherwise, then they are an outlier and should not have been counted!

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