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How Insects Could Completely Change the Way We Approach Protein



[Victoria Dmitruczyk](#) Jun 23 · 8 min read

When I was in the first grade, I had a friend, who we'll call Timmy.

Timmy was an *interesting* character, and he had this need to really try and stand out. However, he did so not by playing sports, or by doing well in school, but by eating random materials he found around our school.

Everyone knew Timmy had this reputation, and as first-graders, we didn't really care what he ate or where it came from.

However, that all changed one fateful day in spring, when rather than trying to eat a pencil, he ate a potato bug (a [pill bug](#)). From this one incident, his reputation as a normal first-grader was absolutely tarnished. All the kids were absolutely disgusted by the idea of consuming bugs.

We see that culture translate towards us today. **We don't eat bugs.** It sounds like something that one of your super outdoorsy friends would do.

But, what if we did? What if eating bugs as a source of protein was the norm?

Slowly, we're seeing this mindset shift towards a future where rather than eating meat, we consume insect-based products. However, we still have a long way to go, and a lot of cognitive dissonance to tackle.

□ **What's Wrong With Our Modern Forms of Meat?**

Right now, conventional meat production **sucks**. It raises a bunch of concerns concerning it's

ecological impact, it's long-term sustainability, health benefits and the way that we actually extract meat.

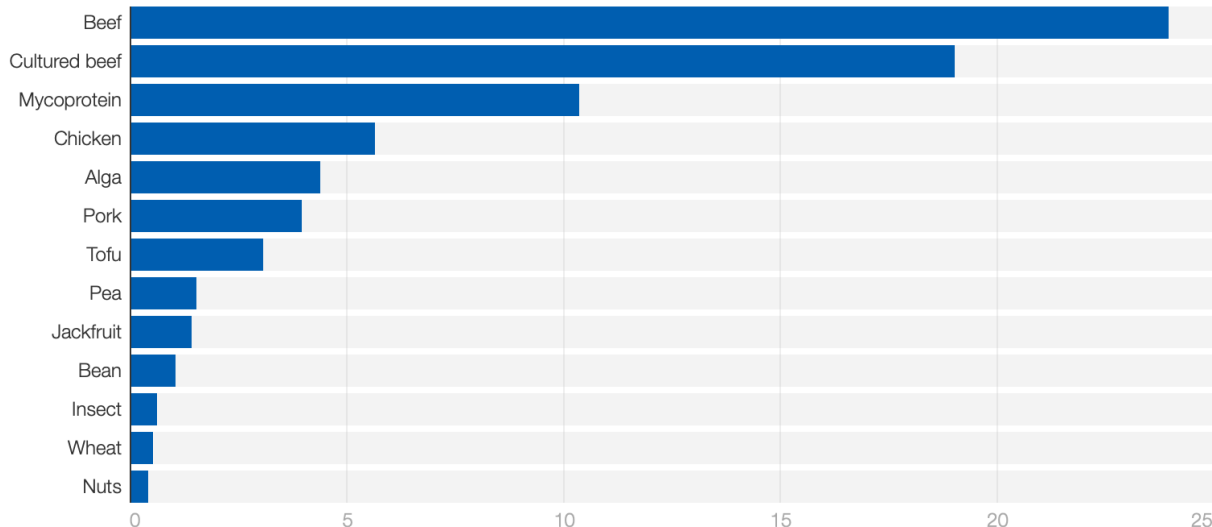
To dig the knife in, here are some statistics that highlight just how bad the meat production crisis is:

- [2400 gallons of water](#) are required to produce just *one pound* of meat. That's the equivalent of drinking 38 400 cups of water □.
- Livestock production accounts for [70% of all agricultural land use](#), occupying 30% of the Earth's land surface.
- [18% of the greenhouse gases](#) on Earth are being produced as a result of the cultivation of livestock.
- Globally, we waste [the meat of 12 billion animals every year](#), with more than half of that meat being usable.
- It's been estimated that swapping some of the beef we eat for beans, peas and mycoprotein (derived from fungi) could [reduce mortality by 5–7%](#).
- Within the last 50 years, the amount humans living on Earth has doubled, however, [the amount of meat we eat has tripled](#). This raises concerns with overproduction, especially in the western world.

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Greenhouse gas emissions per calorie

Emissions intensity kgCO₂EQ per 200kcal



Source: "Meat: The Future Series. Alternative Proteins", World Economic Forum 2019, page 11



Greenhouse gas emissions per calorie for a variety of agricultural goods. Note that here, meat overpowers every other source in terms of its gge output, with beef emitting 4x higher than chicken or pork.

... And I could go on.

To summarize: The longer we continue to produce meat, the bigger and more significant our climate impact becomes.

There's clearly a problem with our meat. However, the agriculture industry **powers** our world, especially in developing countries. It doesn't make sense to abandon it. This would mean abandoning the 1 billion+ people involved in agricultural-related work around the globe, making up 3% of the world's GDP.

This means that we can't completely eliminate the production of meat. But is there another option?

Say Hello to Your New Best Friend: Alternative Protein

We've known about the impact meat production has had for years. There have been summits, UN declarations, and protests, but, **no matter what we do, it's unrealistic to assume that all of us will ever willingly stop eating meat forever.**

We can't just tell people: "don't eat meat" and have everyone actually follow through.

So, how can we get rid of meat's impact without actually getting rid of meat?

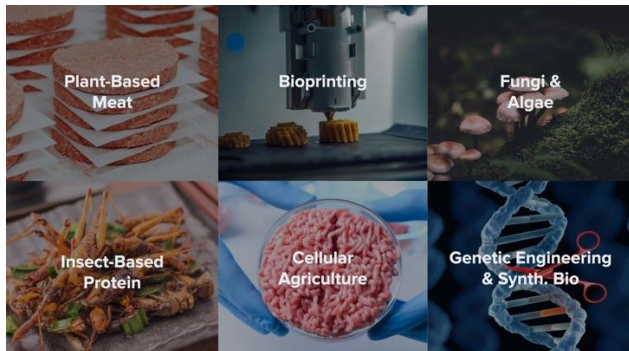
For a while, we've been trying to modify the food we produce by introducing things like rennet, preservatives, and insulin. However, within the last 20 years, the field of *Alternative Proteins* has grown exponentially.

In a nutshell, Alternative Proteins Involve:

Using various emerging technologies and synthetic biology to design and manufacture alternatives to the tissues, fats, and proteins that conventional agriculture produces.

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This isn't just one specific product. There are a variety of subsections and different areas ranging from something as 'futuristic' as growing meat from a test tube and 3D printing food, to something as 'simple' as converting all meat to plant-based products.



A couple examples of approaches to alt. protein.

All of these innovations are exciting, but, let's take a look into something that's already being used as protein across the world, **insect-based foods**.

□ **Insects Are Gross. Why Should we Even Consider Eating Them?**

If you've ever seen a bug in your room, you've probably lunged to kill it, get rid of it, or screamed. Your automatic instinct was definitely not to eat it as a light snack.

* Now, when we prepare insects as a source of protein, it's not as if we're actually just plucking them from the air and eating them raw (although this is an option), but, more on that in a bit.

When you really dig deep into the world of consuming insects for food, you notice that it literally **doesn't make sense not to be eating them**. They have virtually have everything we need nutritionally need to survive and thrive.

There are a variety of bugs that are beneficial to eat, ranging from grasshoppers to mealworms to beetles.

For the sake of evaluating the nutritional value, let's take a look at crickets, since they're pretty popular in the insect-based

foods space. All bugs will vary in terms of the benefits they provide.

For a 100 grams of crickets...

- You'll get **60 g of protein**. In comparison, an identical serving of chicken will give you 31 g, and dried beef will give you 41 grams.
- You'll get your dosage of **all nine essential amino acids**, which are needed for things like the building of proteins and synthesis of hormones and neurotransmitters. This makes crickets the perfect source of alternative protein.
- You'll obtain a large amount of the omega acids, including the **Omega-3s and Omega-6s**.
- You'll receive extremely high levels of vitamin B12. Depending on how it's produced, 100g of crickets can give you up to **1,587.6% of your daily minimum intake**.
- You'll receive a significant amount of vitamins, minerals, and other key nutrients.
- 80% of a cricket is digestible. The next best competitor, the chicken, is only 50% digestible and offers way less nutritional value.

We see positive trends with other bugs as well. Mealworms, for example, are an amazing source of fibre.

It's safe to say that the nutritional value of insects is pretty darn great, but, what's even MORE impressive is how sustainable their production is, especially when compared to conventional farming.

□ **Farming in a Way You've Never 'Herd' of Before**

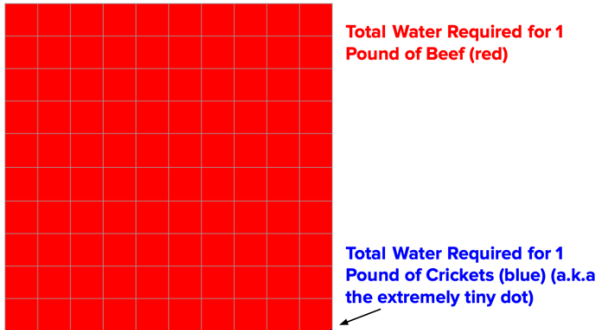
There's no question as to whether farming cattle or farming insects is more sustainable. **The answer here is clear.**

If we want to intake our necessary amounts of (live-species based) protein while minimizing

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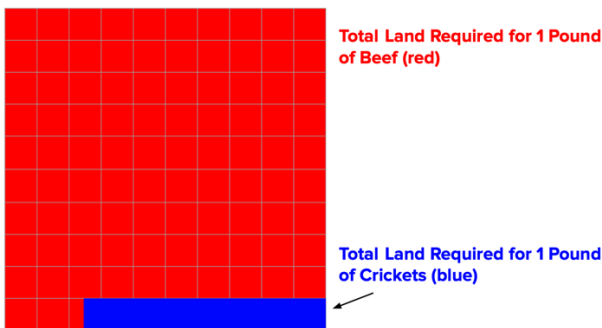
our ecological impact, we need to be eating and producing insects.

Let's use crickets as an example once again:



Water Required for the Cultivation of Beef: The Cultivation of Crickets

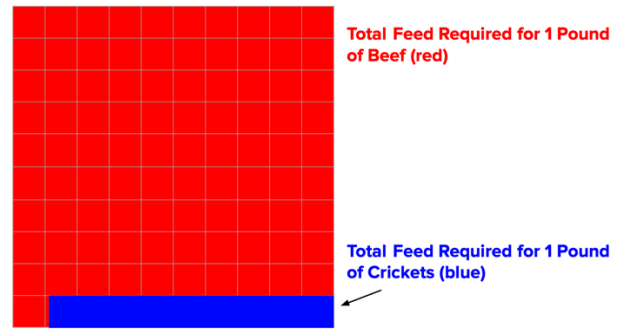
In order to produce **one pound of crickets**, we only need **0.45 gallons of water**. Beef literally requires 2400x that amount. Insects can become fully hydrated from the food they're consuming, and thus, require much less water.



Total land required for beef compared to land required for crickets. You can learn more about the specific land requirements for cattle [here](#).

Cultivating insects also uses much less land than traditional farming. Whereas the production of a single pound beef requires around 200 m² of land, crickets only require 15 m², a notable difference.

Cows and similar animals require a lot of land because their feed comes from pastures. However, crickets, because of their smaller size and nutritional requirements, they take up significantly less space.



Total Feed Required for Cattle: Insects

Finally, crickets use much less feed than other sources of protein. For one pound of crickets, only 2.1 pounds of feed. Initially, this might sound large, however, cows require 25 pounds of feed for one pound of beef.

Other insects have similar environmental benefits as well.

□ Why Aren't We Already Eating Bugs?

Well, that question is a bit clickbait-y. We actually are eating bugs, just not in the Western world and a good majority of Europe.

Back in the day, a couple hundred years ago, individuals living in Europe were living in cold climates, which means they had to get their protein from actual mammals. When they travelled to the Americas and saw Indigenous individuals consuming bugs, it was labelled as 'primitive', even though insect-foods are extremely nutritious.

Around Asia, Africa, and Latin America, eating bugs is seen as normal. A household in Kinshasa, Congo, eats around 300g of caterpillars a week.

However, just because other people consume insects, doesn't mean that there are absolutely no concerns in the world of entomophagy. The biggest concern currently is solely the fact that consuming bugs simply seems disgusting, however, there are a couple other issues that should be considered as well:

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- Just as with other sources of nutrition, insects do have the potential to trigger allergic reactions.
- Wild insects feed on decaying substances, which can contain harmful bacteria. If they're properly prepared, this shouldn't be a problem.
- There's not much information out there regarding the use of pesticides when raising insects. If we want to mass-produce protein this way, we need to look further into this.
- The exoskeletons of insects have been found to have small amounts of 'anti-nutrients' (things like tannins and lectins). However, compared to plant-based foods, these levels are relatively low.
- For individuals obtaining insects from the wild, they have the risk of consuming toxins. Since certain animals require toxins to ward off predators, not knowing how to properly handle these things can end up harming someone.

Note: These 'cons' are low-risk. We also see the same problems come up concerning meat and grain.

Although Timmy was pretty much shunned within the community of first-graders, maybe he was onto something.

It literally doesn't make sense for us not to be eating bugs.

We've grown up surrounded by the idea that bugs are absolutely disgusting, and have had it repeated towards us as we've aged. But, times are changing.

We're noticing the problems that come up with our traditional approaches to food, and forcing change to occur.

Just maybe, insect-based foods are going to completely revolutionize the way we approach protein. They're a tried and true source. They're great. And they are the future.

□ Key Takeaways

- Right now, conventional meat production brings up a variety of health and environmental concerns. Eating insect-based proteins provides a socially and ecologically beneficial alternative.
- Insects are the perfect source of alternative protein, high in protein content itself, containing all the essential amino acids, and a plethora of other vitamins and minerals.
- The process of cultivating insects is significantly better for the environment than traditional protein production. It's more feed, water, and land efficient.
- Around the world, a variety of communities regularly consume insects.
- There are certain concerns regarding the production of insects for protein, however, similar concerns also present when considering the production of plants and meat.

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Written by [Victoria Dmitruczyk](#) Currently diving into the intersection of AI, energy, and sustainable design. Now, for a pun. What's a wind turbine's favourite colour? Blew.