

# What They Don't Want You to Know About Lab-Grown Meat

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✓ Fact Checked

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## STORY AT-A-GLANCE

- › While the fake meat industry is being touted as an environmentally friendly and sustainable way to feed the world, the true intent is to recreate the kind of global control that Monsanto and others achieved through patented GMO seed development
- › Researchers at UC Davis warn there are major environmental downsides to lab-grown meat. According to their “cradle-to-gate life cycle” analysis, the lab-grown meat industry produces up to 25 times more CO<sub>2</sub> than traditional animal husbandry, which nullifies the core ideological foundation upon which the industry is built
- › Each kilo of cultured meat produces anywhere from 542 pounds (246 kilos) to 3,325 pounds (1,508 kg) of carbon dioxide emissions, making the climate impact of cultured meat four to 25 times greater than that of conventional beef
- › At present, most cultured meat companies still use fetal bovine serum (FBS) as the growth medium, which is obtained from unborn calves that are cut out of the womb and drained of their blood while still alive. Hence, most claims of cultured meat being animal-free or free of animal cruelty are false
- › Mission Barns is developing imitation bacon made from a mix of cultured meat, cell-cultured pork fat and pea protein. Have the pigs from which the cell samples are taken been treated with mRNA “vaccines,” and if so, is the cultured pork and pork fat safe to eat?

**While the fake meat industry is being touted as an environmentally friendly and sustainable way to feed the world, the true intent is to recreate the kind of global control**

that Monsanto and others achieved through patented GMO seed development. In the end, lab-created meats are worse for the environment than livestock and will undoubtedly deteriorate human health to boot, just like GMO grains have.

## **Lab-Grown Meat Is Worse for Environment Than Cattle**

As reported by the San Francisco Chronicle,<sup>1</sup> researchers at UC Davis warn there are major environmental downsides to lab-grown meat that aren't part of the conversation or the decision-making process.

According to their "cradle-to-gate life cycle" analysis,<sup>2,3,4,5</sup> the lab-grown meat industry produces up to 25 times more CO<sub>2</sub> than traditional animal husbandry, which nullifies the core ideological foundation upon which the industry is built.

As noted by the authors, investors have poured billions of dollars into animal cell-based meat (ACBM) sector based on the theory that cultured meat is more environmentally friendly than beef. But that hype is primarily based on flawed analyses of carbon emissions.

The primary sources of CO<sub>2</sub> emissions are the purification processes, which require fossil fuels. The bacteria used to produce the "meat" releases endotoxins, and these must be eliminated from the growth medium or else the cells won't reproduce properly. As noted by the authors:<sup>6</sup>

*"Animal cell culture is traditionally done with growth medium components which have been refined to remove/reduce endotoxin. The use of these refinement methods contributes significantly to the economic and environmental costs associated with pharmaceutical products since they are both energy and resource intensive."*

Based on this assessment, each kilo of cultured meat produces anywhere from 542 pounds (246 kilos) to 3,325 pounds (1,508 kg) of carbon dioxide emissions, making the climate impact of cultured meat four to 25 times greater than that of conventional beef.

## **Sham Claims Based on Nonexistent Technologies**

The UC Davis life cycle analysis also points out that several estimates of ACBM climate impacts are dependent on novel technologies that either do not exist yet or are unlikely to work.

For example, some have proposed growing cyanobacteria hydrolysate in open concrete ponds to then be “harvested, sterilized, hydrolyzed and used as an animal cell growth medium.” The problem is that this technology is not currently used, “nor is it one that is currently near feasibility,” the authors note.

In short, the claims propping up the cultured meat industry are a sham, as the idea that cultured meat is a greener option is based on nonexistent technologies rather than the technologies that are in use.

## **Previous Research Also Pokes Holes in Environmental Claims**

Other studies have also been critical of the ACBM industry’s claims. For example, a 2019 article<sup>7</sup> in the journal *Frontiers in Sustainable Food Systems* found that were the world to make the transition to cultured meat, its impact on global warming might initially appear to be beneficial. However, over time, cultured meat production would result in greater warming. As concluded by the authors:<sup>8</sup>

*“Under continuous high global consumption, cultured meat results in less warming than cattle initially, but this gap narrows in the long term and in some cases cattle production causes far less warming, as CH<sub>4</sub> emissions do not accumulate, unlike CO<sub>2</sub> ...*

*We conclude that cultured meat is not prima facie climatically superior to cattle; its relative impact instead depends on the availability of decarbonized energy generation and the specific production systems that are realized.”*

## **False Claims Are Par for the Course**

Despite analyses such as these, you'd be hard-pressed to find a cultured meat company that doesn't claim to generate less greenhouse gas emissions than animal agriculture, although some simply talk in circles around it. Take Mission Barns, for example.

Mission Barns makes imitation bacon and meatballs by mixing pea protein with cultured meat and pig fat produced by cell culture to give the "meat" the flavor and aroma of real pork. Its website makes the following sustainability claim:<sup>9</sup>

*"Animal agriculture generates more greenhouse gas emissions than all transportation combined and is a major driver of deforestation and waterway pollution. Cultivated meat is much kinder to nature – using less resources to preserve our planet."*

Note that they're not actually making any direct environmental claims about their own cultured meat. Instead, they argue that animal farming generates more greenhouse gases than transportation, which is irrelevant when it comes to determining which of two options – farming or lab-created meat – is better for the environment.

If animal farming generates more greenhouse gases than transportation, then lab-created meats generate more greenhouse gases than transportation as well, and likely several times more. It sounds good, though, and it's confusing enough that most readers won't realize that they just told you nothing about their own sustainability.

## **Are Animals Harmed in the Making of Fake Meat?**

Mission Barns also claims that no animals are ever harmed in its cultured meat process. All that is required to grow the meat, they say, is a "small sample [of fat cells] from a pig," which isn't harmed by the biopsy and goes on to live a normal, healthy life. The question is, what are the collected cells grown in?

Cultured or cell-based meats must be grown in a nutrient-rich media, and most are still using fetal bovine serum (FBS), which is obtained from unborn calves that are cut out of the womb and drained of their blood while still alive.

FBS has long been used in science as it's the perfect growth medium. So far, FBS has been considered a byproduct of conventional meat production. Supposedly, cows are not specifically impregnated to harvest the calves for FBS; rather, the calves are sacrificed whenever a random pregnant cow is slaughtered for meat.

However, unless FBS is abandoned across the cultured meat industry, it's easy to foresee a future in which cows are raised and impregnated simply to supply the fake meat industry with FBS, which takes both food waste and animal cruelty to entirely new levels.

## **Animal Cruelty on Steroids**

One could argue that the fake meat industry is already promoting a more obscene form of animal cruelty than animal farming in general, seeing how the increased need for FBS will require more pregnant cows to be slaughtered. Are we absolutely sure that cows aren't being impregnated and calves sacrificed just to satisfy this ever-growing need for FBS? As reported by *Nutraceuticals World*:<sup>10</sup>

*“Given the essential role of FBS in the production process, many of the soon-to-market cultured meats will not truly be completely animal-free or cruelty-free. Rapid growth of cultured meat would drive greater demand for FBS.*

*Several companies, notably Meatable and Future Meat, have introduced alternative growth techniques that do not require FBS. For now, however, FBS-based growth stimulation is still the norm, and it somewhat taints the claim that cultured meat is totally humane.”*

In 2018, Mission Barns CSO David Bowman argued that “fetal bovine serum is a non-starter” because the process is unsustainable. It requires the slaughter of “at least as many cows as are slaughtered now,” he said.<sup>11</sup>

At the time, Bowman predicted that Mission Barns would, in due time, “have media recipes developed in-house that are patented.” The question is, has the company

invented a new media or are they still using FBS? Its “no animal harm” claim really hangs on that detail, and I’ve not been able to confirm it either way.

## **What ChatGPT Says About FBS and Its Use**

On a side note, a member of my team recently chatted with ChatGPT about the use of FBS in the cultured meat industry. Here are a few of the Q & A’s from that session.

**Question** – There are many articles about cultured meats utilizing serum from bovine fetus to grow the cultures, is that true?

**ChatGPT** – As of my knowledge cutoff in September 2021, the information regarding the use of bovine fetal serum in the production of cultured meats is accurate. Traditional methods of cultivating animal cells for laboratory purposes, including the production of cultured meats, often rely on the use of fetal bovine serum (FBS) or bovine serum as a growth medium. FBS contains various growth factors and nutrients necessary for the cells to proliferate.

However, it's important to note that the field of cultured meat is rapidly evolving, and researchers are actively exploring alternative methods to reduce or eliminate the dependence on animal-derived components. The use of FBS raises ethical concerns, as it involves extracting blood from unborn calves. Moreover, it adds to the cost and scalability challenges of cultured meat production.

In recent years, significant progress has been made in developing serum-free or animal-free alternatives for cell culture in the cultured meat industry. Scientists are exploring plant-based and synthetic growth media that can provide the necessary nutrients for cell growth. These efforts aim to make cultured meat production more sustainable, scalable, and free from animal-derived inputs.

**Question** – What is the process used to purify the serum from the fetal blood?

**ChatGPT** – The process of purifying fetal bovine serum (FBS) from fetal blood typically involves several steps to separate and isolate the serum from other components. While

specific protocols may vary, here is a general overview of the process:

- 1. Collection** – Fetal bovine blood is collected from the fetuses of slaughtered cows. The blood is typically obtained by dissecting the fetus and collecting it through a process called exsanguination.
- 2. Clotting and Separation** – The collected blood is allowed to clot at room temperature or in refrigerated conditions. During this time, the blood naturally coagulates, forming a gel-like substance known as a clot. The clot contains red blood cells, white blood cells, and other cellular components.
- 3. Centrifugation** – The clot is then subjected to centrifugation, a process that involves spinning the sample at high speeds. This separates the serum, which is the clear, liquid portion, from the clot and cellular debris. The centrifugation process relies on the principle of density differences to isolate the serum.
- 4. Filtration** – To further remove any remaining cellular debris or impurities, the serum is often filtered through fine filters. This step helps achieve a more purified serum by removing particulates and unwanted substances.
- 5. Sterilization** – The purified serum may undergo sterilization processes, such as filtration through sterilizing-grade filters or heat treatment, to ensure the removal of any potential microorganisms or contaminants that could compromise the quality and safety of the serum.

The resulting purified fetal bovine serum is then typically processed into small aliquots, frozen, and stored at low temperatures to maintain its stability and quality until it is ready for use as a growth medium in cell culture, including cultured meat production.

It's important to note that specific protocols and variations can exist depending on the manufacturer or supplier of FBS. The purification process may also include additional steps or modifications based on the intended use and quality requirements of the serum.

**Question** – Are the calves aborted?

**ChatGPT** – In the context of using fetal bovine serum (FBS) for cell culture, the serum is typically collected from bovine fetuses obtained from pregnant cows at slaughterhouses. The fetuses are not intentionally aborted for the purpose of FBS production. Instead, they are collected as a byproduct of the meat industry.

During the process of slaughtering pregnant cows, the fetuses are removed and their blood is collected. This blood is then processed to extract the serum, which contains the necessary growth factors and nutrients for cell culture. The use of FBS has been a longstanding practice in biomedical and biotechnological research.

**Question** – So in order to create cultured meats, they are dependent on the meat industry to process aborted fetal calves to extract blood from them?

**ChatGPT** – I apologize if my previous response caused any confusion. To clarify, the use of fetal bovine serum (FBS) in cell culture, including the production of cultured meats, does involve obtaining blood from bovine fetuses. However, the collection of fetal bovine serum is not directly linked to intentional abortions.

The source of fetal bovine serum is primarily derived from pregnant cows that are already being slaughtered for meat production purposes. The collection of FBS occurs during this process as a byproduct, rather than being the primary objective. The fetuses are not intentionally aborted for the sole purpose of FBS extraction.

**Question** – How is the abortion not intentional if the mother of the calf is killed?

**ChatGPT** – I apologize for any confusion caused by my previous responses. When pregnant cows are slaughtered for meat production, the collection of fetal bovine serum (FBS) occurs as a result of that process. The intent of the slaughter is to obtain meat from the cows, not specifically to harvest the fetal blood. The fetuses are not intentionally aborted in order to collect FBS.

During the slaughter process, if a cow happens to be pregnant, the fetuses are removed as part of the overall procedure. It is this fetal blood that is then collected and



processed to obtain FBS. The intention behind the slaughter is for meat production, and the collection of FBS is a byproduct of that process.

**Question** – So, it's an accidental abortion?

**ChatGPT** – Yes, in the context of FBS collection, it could be referred to as an accidental abortion ... The collection of fetal bovine serum (FBS) from these fetuses is considered a byproduct of the meat industry, rather than an intentional abortion for the purpose of FBS extraction.

**Question** – So, the cultured meat industry is dependent on the accidental abortions of calves in the meat processing industry?

**ChatGPT** – In the current state of the cultured meat industry, the use of fetal bovine serum (FBS) as a growth medium does rely on the collection of fetal blood from pregnant cows slaughtered for meat production.

However, it's important to note that this reliance on FBS and its association with the meat industry is a matter of convenience and tradition rather than a fundamental requirement for cultured meat production ... While FBS is currently commonly used, the industry is actively seeking alternatives to move towards a more sustainable and ethical approach.

**Question** – It sounds like alternatives for FBS don't currently exist, so that is all hypothetical.

**ChatGPT** – While alternatives to fetal bovine serum (FBS) are being actively researched and developed, it is true that as of my knowledge cutoff in September 2021, serum-free or animal-free alternatives for FBS in cultured meat production are not yet widely available or commercially implemented.

However, it's worth noting that scientific advancements are being made in this area ... Although the widespread adoption of these alternatives may still be in progress, it is not accurate to say that all efforts to find alternatives to FBS are purely hypothetical. There

is ongoing research and development in this field, and the cultured meat industry is actively working towards reducing reliance on animal-derived inputs such as FBS.

It's advisable to consult more recent sources or updates in the cultured meat industry for the most up-to-date information on the progress of serum-free or animal-free alternatives to FBS in cultured meat production.

**Question** – Ongoing research is still a hypothesis and no alternative currently exists.

**ChatGPT** – You are correct that ongoing research and development of alternatives to fetal bovine serum (FBS) in cultured meat production does not guarantee the immediate availability of viable alternatives. While efforts are being made, the implementation and commercialization of these alternatives are still in progress.

As of my knowledge cutoff in September 2021, serum-free or animal-free alternatives to FBS are not yet widely utilized in the cultured meat industry. While there are promising developments and ongoing research, it is accurate to say that no widely accepted and commercially available alternative to FBS currently exists.

**Question** – What viable options are close?

**ChatGPT** – Since my knowledge cutoff in September 2021, there have been advancements in the research and development of alternatives to fetal bovine serum (FBS) in cultured meat production. While no widely accepted and commercially available alternative exists yet, several potential options have shown promise and are being actively explored. Here are a few notable examples:

- 1. Plant-based media** – Researchers are investigating the use of plant-based extracts and formulations as a substitute for FBS. Plant-derived growth factors and nutrients can provide the necessary components for cell culture. Examples include soy protein, yeast extracts and plant-derived growth factors.
- 2. Animal-free synthetic media** – Synthetic media formulations, composed of chemically defined nutrients, are being developed to support cell growth in cultured

meat production. These synthetic alternatives aim to provide precise control over nutrient composition and eliminate the need for animal-derived components.

- 3. Recombinant proteins** – Recombinant proteins, produced through genetic engineering techniques, are being explored as a potential alternative to FBS. These proteins can be designed to mimic the growth factors present in FBS and support cell growth in a serum-free environment.
- 4. Cell-based approaches** – Another avenue of research involves developing cell-based approaches to generate the necessary growth factors and nutrients. This includes genetically engineered cells that produce the required factors or utilizing animal cells that can secrete the necessary components for culture media.

## **Are mRNA-Treated Swine Used in Cultured Pork?**

One last question I have is, are the pigs from which Mission Barn takes its samples treated with mRNA “vaccines”? In a May 11, 2023, article, I pointed out that [pork producers in the U.S. and Canada have been using customizable mRNA-based “vaccines”](#) on their herds since 2018, and the only part of this gene-based “vaccine” technology that has been approved is the mRNA platform itself.

All customized mRNA injections created using this platform are untested. The safety is assumed, based on a single study<sup>12</sup> involving 748 piglets, which were given two doses of an unspecified mRNA Sequivity injection. Of those, 29.8% suffered a serious adverse event, including 24 deaths.

When adding together death, anorexia (wasting) and unthrifty (failure to thrive), 11.5% of the animals were lost to vaccine injury. That’s a loss of more than 1 out of 10 animals, which hardly seems safe.

Moreover, there are no safety studies at all related to human consumption of Sequivity-treated animals, let alone meat grown from mRNA-treated cells. Health authorities insist there are no problems associated with eating mRNA-treated meat, but they have

absolutely no evidence to back that up. It's pure conjecture based on unproven assumptions.

Meanwhile, recent research<sup>13,14,15,16</sup> shows Pfizer's and Moderna's mRNA COVID shots are heavily contaminated with simian virus 40 (SV40) promoters that, for decades, have been suspected of causing cancer in humans, and theoretically can modify the human genome.

Are animal mRNA shots also contaminated with SV40? If so, is it possible that these and/or other DNA contaminants might modify the swine genome? And if so, what do we end up with if cells from genetically modified swine are used to grow meat? I have no answers to any of these questions at the moment, and that's why Mission Barns fake bacon concerns me, even if they don't use FBS.

Mission Barns states that no antibiotics were ever used, but what about vaccines, mRNA gene therapies in particular? Overall, the fake meat industry has a long way to go before all relevant questions are answered. Until then, I recommend avoiding not only all cultured meats but all conventional pork as well, seeing how mRNA gene therapy is allowed even in organic pork.

## Sources and References

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- <sup>1</sup> [San Francisco Chronicle May 22, 2023](#)
- <sup>2, 6</sup> [BioRxiv April 21, 2023](#)
- <sup>3</sup> [New Scientist May 9, 2023](#)
- <sup>4</sup> [Interesting Engineering May 14, 2023](#)
- <sup>5</sup> [Watts Up With That? May 12, 2023](#)
- <sup>7, 8</sup> [Frontiers in Sustainable Food Systems February 19, 2019; 3](#)
- <sup>9</sup> [Mission Barns](#)
- <sup>10</sup> [Nutraceuticals World April 27, 2023](#)
- <sup>11</sup> [Food Dive July 18, 2018](#)
- <sup>12</sup> [USDA Summary of Studies Supporting USDA Product Licensure, P. 17-18](#)
- <sup>13</sup> [OSF Preprints April 10, 2023, Edited April 11, 2023 DOI: 10.31219/osf.io/b9t7m](#)
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- <sup>15</sup> [Anandamide \(Kevin McKernan\) Substack May 20, 2023](#)
- <sup>16</sup> [The Healthcare Channel May 22, 2023](#)