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Post: Lab grown meat's role in a vegan world

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Recommendation

Animal Rights, Industrial Sector, Science, Supply Chain, Transition, Technology

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Content

Let's start by how lab grown (or cultured) meat isn't vegan (and thus doesn't fit in a vegan world):

- Continuously physically extracting cells from currently existing livestock, due to the cells continuously dying (and thus perpetuating animal agriculture for this purpose)
- using animal-based media to grow the extracted cells on (like FBS)
- using animal-based structures that couldn't be cultured in the food itself (like a real bone)
- continuing the idea of eating meat from animals to get nutrients is acceptable and necessary

Middle zone:

- life extension on cells (preventing cells from dying through apoptosis)
    - problem: there are issues with turning a cell into a cancerous state, so additional methods need to be taken to bring a cell back to its regular timeline that includes apoptosis.
- extending the number of cycles the cells can replicate (before it can't or has significant mutations to where it's not useful)

Goal: how lab-grown meat works in context to a vegan world:

- ***species preservation in a lab alongside planned extinction of livestock, to be able to resurrect them as-needed:***

This is like a technological version of Noah's Ark. Livestock are artificial species with many not being able to reproduce on their own. In a vegan world, once they live out their lives and no longer become a part of the human food chain, they will no longer exist as a species. However, it would be somewhat immoral (and be met with resistance, although it's well-known that extinctions are a natural part of life, most animals (99.9%) are extinct, and if we keep livestock around, other species would go extinct instead - and it's harder to save those) if those species completely vanish. To preserve a species (through a mass biological extinction) without having any individuals in the species exist, we could:

1. Have the basic building blocks in place:
    1. *create a digital metagenomic (i.e. collective) DNA gene library*: totals all the quintessential genes unique to a species that would come from many different individuals (as no one individual has all the unique genes of a species)
    2. *extract cells to grow the DNA in*: not all of the DNA of a cell (and thus individual) is in nuclear DNA. Some DNA is in mitochondrial DNA that would be in the cell, not the nucleus, but comprises part of the species' genetic code
    3. *house epigenetic chemicals to alter gene expression:* replicates the real environmental factors/individual's effects on the genetic code so that gene expression can keep changing as it would naturally from its physical environment through time.
2. Keep them in existence - through archiving and mass producing:
    1. *The genetic code would be digitized to be kept on computers*: for easy copy/pasting in multiple places, so the code doesn't disappear completely.
    2. *Cells would continuously be replicated in a lab:* instead of extracted from animals. This would be done by replicating cells to where they can have infinite cycles and produce as many cells as possible
    3. *synthesize chemicals in a machine or through chemical reactions:* DNA and epigenetic chemicals would need to be scaled to be at-the-ready for resurrection use

- ***Issues:***
    - Not all of these methods are feasible with today's technology.
        - *There's still so much we don't know about what each gene does in a genetic code (as seen by the timelines of genomics and epigenetics, the fields are ever-evolving):* so there are likely chemicals and other factors that affect gene expression in a way we don't know about that are a part of preserving a species that we won't archive and preserve and thus would lead to not being able to fully complete a resurrection. For instance, we haven't even fully mapped the entire human microbiome yet - it's still an pre-epigenomic research project in progress. This means we haven't

- Since genetic research is ever-evolving (due to genetics being so complex and intricate), there's so much involved in genetics that we might not know about and thus wouldn't archive as a component in the collective laboratory materials for resurrection. This may lead to incomplete resurrections of species when the time comes for that.
    - *Instead of letting a species go extinct and preserve the remnants in a lab for eternity, it may be better to help livestock continue to grow, but in a setting that prevents them from harming other species:* like giving them their own planet to grow on (although there would still be the epigenetic issue, as it wouldn't be as it is on Earth in their regular setting, but it would be a natural continuance, unlike a lab. However a lab would be able to ideally replicate Earth-like scenarios for the biological materials it has. There are pros and cons to each means, and quite possibly both would be needed for the vegan world situation).
- If the samples aren't cared for, preserved properly, and have enough on-hand for if a few aren't functional anymore, a species could be lost in the lab to all of time.
    - *This is where eating lab-grown meat comes in:* food consumption is going to fund laboratory preservation of species and allow for more than enough samples and genes to continue through time to preserve it, albeit in a new context.

- *chemical synthesizing is difficult, due to the lack of technology being able to model chemicals:* MRI is barely being able to image atoms and protein folding is so complex, it may need quantum computers. So even though there are chemical synthesizing machines (including DNA) out there, knowing the chemical structure to place into the machine is the bottleneck.
- *Coextinction and metagenomics:* if a livestock species goes extinct, then other species that coexist with them would go extinct too. These may also make up or impact a livestock body's overall genetic code and if they're not documented, would lead to incomplete resurrections. One such possibility is a livestock's microbiome - the chemicals that microbes produce to keep a livestock alive would kind of, in a way/sense, be a part of the livestock's overall genetics, even though it's not the livestock's nuclear DNA. If livestock aren't alive, there may be a possibility that these microbes would also not be alive, and even the life that rely on those microbes wouldn't be alive either (a cascading event).
- *resurrection hasn't been achieved yet (outside of suspended animation):* resurrection and and de-extinction is still sci-fi.

Comments

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