The future of meat – Part 3

While livestock producers have faced numerous challenges in the past, the ones that lie ahead may be the most difficult of all: global warming and cell-cultivated meats.

A critical issue facing livestock producers over the next decade or so is the way that developers of cell-cultivated meats use the contribution of animal agriculture—particularly beef—to global warming as a key element in their bid to replace most land-based meat production with meat cells grown in large bioreactors.

If growing meat in a bioreactor sounds like something out of a sci-fi movie, it's not. Aryn Baker describes the current state of the development of this process in her article, "The Cow that Might Feed the Planet," published in the Nov. 8/Nov. 15, 2021 print issue of Time magazine. This is an article that should send shivers down the backs of meat producers.

Baker points out that more than 70 firms or firms-in-development are in the race to solve the technical challenges that would make cell-cultivated "beef, pork, duck, tuna, foe gras, shrimp, kangaroo and even mouse (for cat treats) to market." Will some or even most of these firms fall by the wayside? Certainly, but it only takes one or two to succeed to provide a significant challenge to the current agricultural model including grain, oilseeds, and hay grown primarily as animal feed.

Cell-cultivated meats differ from the more familiar plant-based meat substitutes because the end product consists of cells that carry the same DNA as the animal they were taken from. This is not a "fake meat" and that makes the challenge more serious.

To create their product, cells are extracted from a living animal, and then multiplied in vats full of nutrients. The meat cells are then separated out of the growing medium and combined with animal fat grown in separate bioreactors to make a product that the developers hope will cook and taste just like the hamburger we buy in the grocery store. Ribeye steaks are much further down the line.

The science is fairly straight forward even if the path to an economically viable product remains to be found. With enough time and money, success is likely.

One troubling factor for farmers is the argument the developers of cell-cultivated meat are using to justify their product.

In her article, Baker points out, "Livestock raised for food directly contributes 5.8 percent of the world's greenhouse-gas emissions, and up to 14.5 percent if feed production, processing, and transportation are included…. Industrial agriculture, particularly beef, drives deforestation, and cows emit methane during digestion and nitrous oxide with their manure, greenhouse gases 25 and 298 times more potent than carbon dioxide, respectively over a 100-year period."

Can the challenge to today's meat production model be any clearer? The current system came to characterize animal agriculture over the last 50 to 70 years as a few firms came to dominate the processing of animals grown in large barns or finished off in large feedlots. More troubling for livestock producers is that "four of the world's five largest meat companies (JBS, Cargill, Tyson, and BRF) are already embracing the technology."

The challenge from cell-cultivated meat is not limited to livestock producers. If the future of meat moves in the direction seen by Baker's article, crop farmers face diminished demand for their production. And that, in turn will have an impact on the viability of many rural communities.

What will happen to the many smaller communities across the agricultural belt if the processors purchase or merge with these new cell-cultivated meat firms and no longer need many

of their current slaughter/packing plants to provide the products they sell to grocers? The impact could be devastating.

The farm-level survivors in all this are likely to be smaller operators who are already raising their animals in a more sustainable, regenerative mixed crop/animal production system with a specialized marketing niche.

As we finish this column, we are left with some questions.

What nutrient source does this new technology use in the bioreactors? Is it corn and soybeans?

Will the quantity be same as currently used for animal production?

If the process does use grain and oilseeds in anything near current levels, then what does that do to the argument about the extra greenhouse-gas emissions that move the impact of animal agriculture from 5.8 percent to 14.5 percent?

What wastes—cell multiplication in a bioreactor certainly results in poo of some sort—do the bioreactors produce and are they handled in an environmentally responsible manner? This is a critical question as these systems gear up to the capacity needed to supplant much of current animal production.

While the two of us don't have a clear vision of the path forward, we do know that the sooner farmers of all stripes sit down and begin to chart out a more sustainable future, the better. Simply attacking cell-cultivated meat and meat companies is not a viable long-term strategy.

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