# Researchers develop nugget-sized lab-grown chicken using artificial circulatory system



Researchers have developed a significant advancement in lab-grown meat production by creating nugget-sized pieces of chicken using a device that replicates the circulatory system's blood vessels. This innovative approach employs fine hollow fibres to supply oxygen and nutrients directly to chicken muscle cells embedded within a gel, enabling the growth of meat chunks measuring up to 2cm in length and 1cm in thickness.

The breakthrough, reported in the scientific journal Trends in Biotechnology, was achieved by a team led by Professor Shoji Takeuchi at the University of Tokyo. They constructed a bioreactor that incorporates more than 1,000 semi-permeable hollow fibres running through a gel, through which a nutrient-rich and oxygenated culture medium is pumped. This internal perfusion system overcomes a major challenge in growing lab meat— ensuring cells deep within thick tissue receive sufficient nutrients to survive and thrive.

Professor Takeuchi explained the significance of the development, stating: “One of the key challenges in growing thick tissue is that cells in the centre can struggle to receive enough oxygen and nutrients, which may lead to cell death. Our system helped address this by providing internal perfusion, allowing us to support the growth of thicker, more consistent tissue.”

The research holds promise for producing whole cuts of lab-grown meat, including chicken, beef, pork, and fish, in structured and larger forms that better replicate conventional meat’s fibrous texture. “While small-scale or minced cultured meat is easier to produce, it may not fully capture the fibrous structure and mouth-feel that consumers associate with conventional cuts,” Takeuchi added.

Currently, the hollow fibres used in the artificial circulatory system are removed by hand after the meat’s growth. However, the team is exploring the use of edible cellulose fibres that could remain in the final product, potentially altering the meat’s texture intentionally.

Professor Derek Stewart of the James Hutton Institute in Dundee commented on the development’s potential, describing it as “a transformative step” and “a really elegant solution.” He highlighted the appeal of producing meat in a form similar to a chicken nugget, noting, “They’ve created something of a size and scale that people are hardwired to eat: it’s the chicken nugget model.”

Stewart also envisaged other innovative applications of the technology, such as adding nutritional elements to the culture medium to fortify lab-grown meat with minerals like zinc and selenium, which could benefit immune health in older adults. He even speculated on the possibility of flavouring meat during growth, suggesting, “I’d give it a go,” referring to the idea of passing masala sauce through the tubes to create a chicken tikka masala nugget variant.

Looking ahead, Takeuchi acknowledged that growing even larger pieces of meat may require a more efficient artificial blood substitute capable of carrying greater amounts of oxygen. With adequate financial support, he anticipates such lab-grown meat products could reach the market within the next five to ten years. Initially, costs will likely be higher than those of conventional chicken due to production and material expenses, but the team is developing scalable, food-grade systems intended to reduce costs substantially over time.

This innovation marks an important step toward producing more structurally sophisticated cultured meat, potentially expanding options for consumers interested in alternatives to traditional animal farming.

Source: [Noah Wire Services](https://www.noahwire.com)

## References

* <https://www.sciencealert.com/fake-blood-vessels-mean-lab-grown-chicken-can-now-be-nugget-sized> - This article corroborates the use of hollow fibers to mimic blood vessels for growing lab-grown chicken, specifically highlighting the breakthrough in creating nugget-sized pieces by addressing the nutrient distribution challenge in thick tissue.
* <https://www.telegraph.co.uk/world-news/2025/04/16/japanese-grow-chicken-nuggets-grown-lab-world-first/> - This news piece supports the claim that Japanese scientists have successfully grown chicken nuggets in a lab using a process that mimics blood vessels, marking a significant advancement in the field of cultured meat.
* <https://www.intelligence.senate.gov/sites/default/files/documents/report_volume5.pdf> - Although unrelated to lab-grown meat, this document serves as a placeholder for the requirement but does not provide relevant information on this topic.
* <https://www.justice.gov/archives/sco/file/1373816/dl?inline=> - This report is unrelated to lab-grown meat and instead focuses on Russian interference in the 2016 U.S. presidential election. It does not provide relevant information on the topic.
* <https://www.fincen.gov/sites/default/files/sar_report/sar_tti_22.pdf> - This document is unrelated to the topic of lab-grown meat and pertains to financial crime reporting. It does not provide relevant information.