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Roslin scientists develop pig fat stem cells for cultivated meat industry

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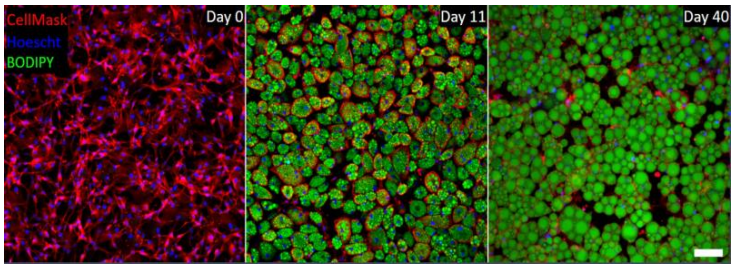

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In a major breakthrough for the cultivated meat industry, scientists at The Roslin Institute have developed a new line of pig stem cells capable of producing fat tissue with exceptional consistency and without the need for genetic modification. The pioneering development, recently published in NPJ Science of Food, promises to address one of the sectorâ??s most persistent challengesâ??creating realistic and sustainable animal fat at scale.

The cells, named FaTTy, are derived from early-stage stem cells and demonstrate the rare ability to grow indefinitely in laboratory settings while consistently transforming into fat tissue. This unique trait sets them apart from most animal stem cells, which typically lose their ability to differentiate into fat after several divisions, making mass production infeasible.

"We didnâ??t simply develop a toolâ??we made a very special discovery," said Dr Tom Thrower, lead researcher at The Roslin Institute. "The fact that these cells not only grow indefinitely but also retain their ability to become fat at such high efficiency is something we have never seen before in livestock stem cells. It opens the door to new possibilities in cultivated meat and beyond."

The breakthrough holds both ethical and practical implications. Fat is a key component in delivering the flavour, texture, and mouthfeel consumers expect from traditional meat products. Cultivated meat producers have long struggled to replicate the complexity of animal fat without resorting to gene editing or using animal-derived additives.

In their research, Roslin scientists cultured stem cells from five different piglets and identified one cell line that could be reproduced hundreds of times without losing its fat-producing potential. The fat generated was found to closely mirror natural pig fat in composition, while also offering a slightly healthier profile due to increased levels of monounsaturated fats.

Importantly, the FaTTy cell line is being shared with academic and industry partners to accelerate progress in cellular agriculture and fat biology, potentially advancing the global cultivated meat market, which is projected to grow to between $5 and $30 billion by 2030.