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Pursuing healthier bacon through genetic engineering and cloning

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Associated Press

SAN FRANCISCO - A microscopic worm may possess the vital genetic spice to make heart-friendly bacon.

A team of geneticists announced Sunday they've mixed genetic material from the roundworm C. elegans with pigs to produce swine with significant amounts of omega-3 fatty acids, which are normally found in salmon and other oily fish and believed to stave off heart disease.

Six of the 10 cloned piglets they've produced showed increased levels of the coveted molecule, giving researchers hope they can improve the technique in pork and do the same in chickens and cows.

"We all can use more omega-3 in our diet," said Dr. Jing Kang, the Harvard Medical School researcher who modified the omega-3-making worm gene so it turned on in the pigs. Kang is one of 17 authors of the paper appearing in an online edition of the journal Nature Biotechnology.

The researchers also said their creations can be used to better understand human disease.

The cloned, genetically engineered pigs are the latest advance in the agricultural biotechnology field, which is struggling to move beyond making esoteric products such as soy that's resistant to weed killers and bug-repelling corn.

Hoping to create healthier, cheaper and tastier products that consumers crave, Monsanto Inc. of St. Louis and its biotech farming competitors like DuPont are developing omega-3-producing crops that yield healthier cooking oils. Kang said 30 academic laboratories are now working with his omega-3 gene, presumably pursuing similar projects.

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"Consumers have responded pretty positively when asked their opinion of food modified to improve food quality and food safety," said Christine Bruhn, director of the University of California, Davis' Center for Consumer Research. "Just as long as the taste isn't altered negatively."

Earlier experiments have succeeded in manipulating animals' fat content but most never made it out of the lab because of taste problemsm, though omega-3-enriched eggs produced by feeding chickens large amounts of flax or fish meal are popular.

While boosting Omega-3s doesn't decrease the fat content in pigs, the fatty acids are also important to brain development and may reduce the risk of Alzheimer's disease. A lack of omega-3 has been implicated in depression and the American Heart Association recommends two or more weekly servings of fish, particularly fatty fish like trout and salmon, which are naturally high in omega-3s.

"There's a lot of potentially beneficial products that could come from this technology," said Irina Polejaeva, a top livestock cloner and chief scientific officer of Austin-based ViaGen Inc., which is awaiting federal approval to clone valuable beef-producing cattle.

ViaGen only clones and doesn't genetically engineer animals, a highly controversial step in the latest work.

It's one thing for traditional crops like corn to be engineered to be pest-resistant, and people already eat genetically engineered soy beans in all manner of processed food. But biotech companies run into what bioethicists call the "yuck factor" when they begin tinkering with animals.

Federal regulators - and even the researchers themselves - cautioned that meat and dairy products rich in omega-3s will probably not be sold in supermarkets anytime soon. The Food and Drug Administration has never approved food derived from genetically engineered animals and there are high hurdles to overcome. Unlike crops, the FDA treats genetically engineered animals as medicine and requires extensive testing before approval.

"We understand that this research is in the very early stages," FDA spokeswoman Rae Jones said. "This technology will not likely reach meat counters for many years."

The FDA is still considering Waltham, Mass.-based Aqua Bounty Technologies' application to market a salmon genetically engineered to grow faster, the only such request pending with the agency. Aqua Bounty began its federal application process about nine years ago and there is no indication when the FDA will rule.

In the meantime, the researchers of the latest project said they will use their genetically engineered pigs to study human disease, especially heart conditions.

"The paper isn't about cloning," said Randall Prather, a University of Missouri researcher and co-author of the Nature Biotechnology report. "We have created a model to study the human condition."

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