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Would you like fish oil with that?

Agençe France-Presse

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Farm animals could be genetically modified to produce heart friendly fish oils, according to a controversial suggestion published today.

Could farmed animals be engineered to make their own healthy fish oils? *(Image: U.S. Dept of Agriculture)*

U.S. researchers led by Associate Professor Jing Kang of Massachusetts General Hospital and Harvard Medical School showed how genetically engineered mice made their own omega-3 fatty acids, which they would normally have to obtain from food.

The researchers inserted a roundworm gene that converted omega-6 to omega-3 fatty acids into experimental mice and published their results in today's issue of the journal *Nature*.

They suggested the experiment could one day be extended to the farmyard, creating a new generation of animals that would produce healthier eggs, milk and meat.

The researchers inserted into the mice the aptly-named *fat-1* gene from the roundworm *Caenorhabditis elegans*, one of the most closely studied creatures in biotechnology.

This worm gene codes for an enzyme that converts omega-6 into omega-3 fatty acids, an enzyme that most animals including mammals do not have.

Mice fed a diet without omega-3 fatty acids but who carried the worm gene could make their own omega-3 fatty acids, which accumulated in their body tissue.

These transgenic mice had acquired the ability to add a double bond into an unsaturated fatty-acid hydrocarbon chain, and so converted the omega-6 to omega-3 fatty acids.

These modified mice had far higher levels of omega-3 than their counterparts who did not have the worm gene.

The proportion of omega-6 to omega-3, which varied from 20-to-one or as much as 50-to-one depending on the tissue, plummeted to almost one-to-one.

The researchers followed the mice for four generations. Mice given this gene

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bred normally, the gene was passed onto successive generations and the animals showed no signs of ill-health.

"At present, farm animals are fed fishmeal and other marine products [as a source of omega-3 fatty acids] but this is time-consuming and costly and is limited by the source," Kang's team suggested.

"Production of [omega-3] fatty acids by the animals themselves would be a cost-effective and sustainable way of meeting the increasing demand."

Opponents to this technology say genetically modifying animals could be hazardous, arguing that inserted genes could be disseminated to wild animals or leap the barrier to other species.

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