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12-1-2006

Why the Omega-3 Piggy Should Not Go to Market

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Recommended Citation
Fiester, A. (2006). Why the Omega-3 Piggy Should Not Go to Market. Retrieved from http://repository.upenn.edu/bioethics_papers/54

Postprint version. Published in *Nature Biotechnology*, Volume 24, Issue 12, December 2006, pages 1472-1473.
Publisher URL: http://dx.doi.org/10.1038/nbt1206-1472

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Abstract
The paper in your April issue by Lai et al. entitled "Generation of cloned transgenic pigs rich in omega-3 fatty acids" (Nat. Biotechnol. 24, 435–436, 2006) perfectly captures the fundamental problem with American biotech research. That problem is that scientists pursue their research agenda to further scientific knowledge - all well and good - but when the project succeeds they invent problems for which their research results can be marketed as a solution. This unreflective move from 'pure science' to commercialization may end up as biotech's undoing.

Disciplines
Biotechnology

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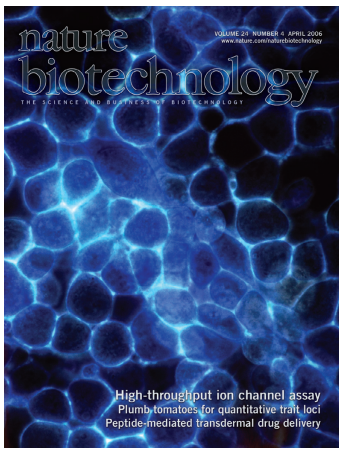
To the editor:
The paper in your April issue by Lai *et al.* entitled "Generation of cloned transgenic pigs rich in omega-3 fatty acids" (*Nat. Biotechnol.* **24**, 435–436, 2006) perfectly captures the fundamental problem with American biotech research. That problem is that scientists pursue their research agenda to further scientific knowledge—all well and good—but when the project succeeds they invent problems for which their research results can be marketed as a solution. This unreflective move from 'pure science' to commercialization may end up as biotech's undoing.



The omega-3 pig is just the latest 'product' to follow this pattern. Recall the case of cloned cattle. As science, these projects had value in adding to our understanding of the process of cloning and the mechanisms of reproduction. But the attempt to employ this technology for a marketable product has hit a hurdle. Although the safety data on milk and meat from cloned cattle appear definitive, the US Food and Drug Administration still continues to drag its feet and has failed to lift the moratorium on the release of cloned products into the food supply—after three years. Why? In short, because no one wants to eat them. Of course, it's a longer story than that, but if there were either market demand or a pressing need for this product, that moratorium would have been lifted long ago.

The story of the omega-3 pig has a parallel plot. Early transgenic projects in pigs demonstrated an important proof of concept, but creating omega-3–enhanced pigs seems to come from the "because we can" school of justification. Even if the benefits of dietary omega-3 were incontrovertible (which they're not)[1], and even if the only sources of omega-3 were animal based (which they aren't), the rationale for creating these genetically modified (GM) pigs is specious at best. Thus, in their paper, Lai *et al.* write, "The only way to enrich the tissues of mammals with *n*-3 fatty acids has been dietary provision of *n*-3 fatty acids. Thus, the food industry must feed animals with flaxseed, fish meal or other marine products. In view of the decline in marine fish stocks and the potential contamination of fish products with mercury and other chemicals, alternative, land-based dietary sources of *n*-3 fatty acids are needed." What happened to flaxseed?

But you might say of the super-pig, "so we don't need them, and few people are likely to buy them. Why not let market forces decide the fate of this product post-commercialization?" There are four reasons why this pig ought not to go to market.

First, the use of transgenic technology for this application represents the worst type of 'research waste': precious scientific resources of time, mental energy and money that could be used to tackle serious human and environmental threats are being devoted to a frivolous cause. The list of devastating problems begging for a scientific solution include: chronic, genetic and infectious diseases, famine, food and water safety, global warming, the destruction of ecosystems—the list goes on and on. Because this project was supported by public money, including several US National Institutes of Health grants and one from the US National Cancer Institute, it took funding away from other projects that could have been more beneficial.

Second, the one problem we don't have is a shortage of omega-3—even if it turns out to be the nutritional wonder that some tout it being, which is now in doubt[1]. Not only is it found naturally in readily available foods like walnuts, flaxseed and fish, but it can be found in supplements and nutritionally supplemented foods like Smart Balance

peanut butter, oil and margarine. We certainly do have a very serious problem of obesity and nutrition in the United States (and increasingly elsewhere), but neither are problems science needs to solve. We are obese because we eat too much, and we are unhealthy because we choose to eat the wrong foods. Offering us GM pork to provide us with a plentiful nutrient is an obvious attempt to drum up a need that justifies the science.

Third, unlike research on peanut butter, omega-3 pork requires extensive research on animals. At a time when Americans are increasingly concerned about the general use of animals in scientific research, the animal biotech industry needs to confine its work to projects necessary for the achievement of important health, safety or medical goals. There are surely worthy goals to pursue in biotech agriculture and medicine, but this isn't one of them. The concern about animal welfare issues is exacerbated in this case by the widespread unease with conventional husbandry practices for this species: pig farming is one of the most highly criticized areas in the agricultural sector. Let's adopt universal humane farming practices for this intelligent species before we make animal welfare matters worse for the pig.

Finally, and for many people, most worrisome, there is something profoundly amiss in our stampede down the biotech path for every trivial application **AU:OK?**. The level of the change now possible, the speed at which we can make these dramatic alterations and the potential consequences for animals, the environment and ourselves—for the world as we know it—ought to give us great pause. It is naive to think that this research, unbridled, will have only a trivial impact. This latest work already says a great deal about us, and it isn't flattering. One scientist commented about the potential of the omega-3 pig: "People can continue to eat their junk food. You won't have to change your diet, but you will be getting what you need"[2]. We are altering the genome of an animal to enable consumers to continue with their self-destructive eating habits. What does this say about us if that is reason enough to manipulate sentient life?

Given the significant financial and scientific resources that will be required to bring this pig to market, the absence of any real need for it, let alone a pressing one, and the stakes involved in our limitless pursuit of animal biotech, this is one biotech application that we ought to forego.

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2. Kolata, G. Cloned pigs could provide meat that benefits the heart. *New York Times* (March 26, 2006). http://www.nytimes.com/200603/26/health/26cnd-pig.