

Would You Like Fries With Your Clone?

European and U.S. food safety agencies have deemed cloned pigs and cows safe to eat. Should we all become vegetarians?

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Would you order jambon cloné in a French restaurant? How about a cloneburger with fries? Few words are less likely ever to find their way onto a menu than clone. In the past week, however, government scientists in Europe and the United States took a big step toward allowing cloned meat and milk on the dinner table. The U.S. Food and Drug Administration issued a report declaring that cloned livestock was safe to eat, and the European Food Safety Authority says meat and milk of cloned animals is nothing out of the ordinary.

The reports caused indigestion on two continents. Europeans harbor a deep revulsion toward any funny business with their food. They've demanded (and gotten) legislation requiring labeling of genetically modified (GM) foods and have steadfastly resisted importing GM crops from the United States, Brazil and elsewhere. Although Americans have been much less bothered about biotechnology and food—they couldn't seem to care less about eating GM crops—it's safe to say that few people outside the livestock business are thrilled by the prospect of putting a fork into a cloned porterhouse. Watchdog groups condemned the findings, calling for mandatory labeling. Given cloning's lack of gustatory appeal, a label might be all that's needed to kill the practice.

Aside from being unappetizing, is there any potential danger from eating the meat or milk of a cloned pig or cow? On principle, you'd expect not. Cloning, by definition, produces exact copies. The clone of a cow that produces great milk should itself produce great milk. Biology, on the other hand, is notorious for its disregard of such simplistic notions. Just because you make a creature that has the exact same DNA as a prize cow, does that mean the creature will also be a prize cow? Or could it be something else—something harmful to eat?

The livestock industry is counting on cloning making exact copies. On a U.S. farm, a good cow can fetch about \$1,000 on the butcher's block. On such an animal there's no point in using cloning, which can cost \$20,000 a pop. However, an elite cow—one whose genes are optimized for producing the healthiest, longest-living and most productive offspring—can fetch more than \$100,000. With such a price tag, elite cows aren't allowed to bear calves at the natural rate of one per year. Farmers insist on a blistering 10 to 20 births a year. To keep up this pace, veterinarians employ an array of reproductive technologies, including in vitro fertilization and artificial insemination. Cloning is the latest, and perhaps the most powerful, reproductive tool in the vet's black bag.

In the United States farmers have agreed to adhere to a voluntary moratorium on introducing cloned animals into the food chain. There's little chance, anyway, that a farmer would throw away \$20,000 on an animal that's worth only \$1,000. But the moratorium doesn't include cloning per se. Farmers have already cloned "a few hundred" elite cows in the United States, says Dave Farber, a veterinarian and president of Trans Ova Genetics of Sioux Center, Iowa, which performs the operation as a service. The offspring of these cloned animals have already entered the food supply.

Should consumers be afraid? There is some evidence that cloned animals show a higher propensity for developmental problems, such as mental retardation. That would be tragic in a human, but the milk from a retarded cow is not necessarily any different from the milk from a smarter than average cow. Indeed, the European scientists found no compositional or nutritional differences in the milk or meat derived from clones, and "no evidence of any abnormal effects" in the progeny of cloned animals.

New research about genetics may be indirectly fueling fears about cloning. Scientists have learned in recent years that what goes on in the cell's molecular machinery is far more complicated than they used to think. Epigeneticists have begun to enumerate ways in which traits can be passed from one generation to the next that have nothing to do with DNA. This raises the theoretical possibility that cloning may have unintended effects even though a cloned animal is an exact DNA replica of the original. "Although successful clones may appear normal, the possibility remains that some may harbor subtle genetic defects that could impair their health or make them unsafe for consumption," said the Union of Concerned Scientists in a statement. Most anticloning groups use similar reasoning in calling for more time and more studies before cloned meat and milk are allowed to be sold as food. "If you don't get all the details, you don't know your subject," says Sonja Van Tichelen, director of the Eurogroup for Animals.

The problem with epigenetic effects is that nobody knows what they might be, or even if, in the case of cloned livestock, they would have any effect worth noting. The safety authorities in the United States and Europe have apparently reasoned that a theoretical possibility is not reason enough to ban the practice. Bad publicity, on the other hand, may be. "If it wasn't for all the publicity" about cloning, says Princeton molecular biologist Lee M. Silver, "the FDA wouldn't be looking into this at all. If you have a new breed of cow, it doesn't have to go through this kind of scrutiny. [Cloning] is just a different form of breeding." The benefit of livestock cloning (healthier breeding stock) is obvious for farmers but is unlikely to inspire consumers; a similar situation beset Monsanto in the 1990s with GM seeds. It's difficult to imagine Europeans accepting cloned livestock, regardless of what the scientists say. Judging from the past, America will be a different story.

With Christopher Werth in London

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