Q&A on the science of growing hamburger in the lab

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(AP)—At a public tasting in London Monday, Dutch scientists served hamburgers made from cow stem cells. Some questions and answers about the science behind the revolutionary patty.

Q: What are stem cells?

A: Stem cells are an organism's master cells and can be turned into any other cell type in the body, i.e. blood, tissue, muscle, etc.

Q: Why is the meat so expensive to produce?

A: The technology is new and scientists are making very small quantities of meat. There are no economies of scale to offset the initial high costs. If more scientists or companies start using the technology to produce more meat products, that could drop the price substantially.

Q: When could this meat be in stores?

A: Probably not for another 10 to 20 years. It would take years to refine the technology, encourage other producers and scientists to get involved, and overcome any regulatory issues.

Q: Who paid for the research?

A: Sergey Brin, co-founder of Google, underwrote the 250,000-euro ($330,000) project, which began in 2006.

Q: How is this better for the environment?

A: It could reduce the number of animals needed for the meat industry. Raising cows, pigs, chickens, etc. contributes substantially to climate change through the production of methane gas. Growing meat in the laboratory could reduce the impact on agricultural land, water and resources.

Q: How long does it take to grow a burger?

A: At the moment, a long time. It has taken two years for scientists to grow enough meat for two hamburgers. The research into the process started in 2006. Once there are enough strands of meat (about 20,000 small strands), scientists can form a five-ounce (140-gram) hamburger patty in about two hours.

Q: What are the implications for vegetarians?

A: PETA, People for the Ethical Treatment of Animals, supports attempts to grow meat in labs because they say that will greatly diminish the amount of animal suffering. Donor animals are needed for the muscle cells, but taking those samples doesn't hurt the animal. One sample can theoretically provide up to 20,000 tons of lab-made meat. But lab-grown meat is still meat, and not an option for vegetarians.

Q: Is it possible to make other kinds of meat in the laboratory?

A: Yes. The science is theoretically the same, so the same techniques should also allow researchers to make chicken, fish, lamb, etc. Dutch researcher Mark Post, who led the research on the lab-made hamburger, started working with pig cells. He had intended to make a sausage, but his American funder suggested a hamburger instead.

Q: Can they make other meat products?

A: At the moment, scientists are only working on making processed or minced meat, because that is the easiest kind to replicate. Processed meat accounts for about half of the meat market. Post said it should be possible to make more complicated cuts like steaks or chops in the future, but that involves using more advanced tissue engineering techniques. He estimates that it might be possible to make a steak in about 20 years.