News

Controversy Over Chinese Scientists Creating Micropigs

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GLOBAL - Dr Bob Carling writes about the controversy over Chinese scientists using genetic manipulation to create 'micropigs' and selling these as pets to fund their research.

The technology of DNA manipulation makes human beings even more capable of changing organisms much faster than traditional breeding techniques. The recent announcement by Chinese scientists, who have made small pigs – 'micropigs', the size of a small dog – has sparked off yet another controversy about this technology, with animal rights campaigners and bioethicists voicing objections and warning of problems.

At the Shenzhen International Biotech Leaders Summit in China in September, the Beijing Genomics Institute (BGI) – famous for several high-profile gene-sequencing breakthroughs – announced their intention to enter the pet market by selling their micopigs at about £1000 each.

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> **"Genesis – Get 'em out by Friday**
> ***It's said now that people will be shorter in height***
> ***They can fit twice as many in the same building site***
> ***(They say it's alright)***
> **Foxtrot (1972) "**

Because pigs have physiological similarities to humans, and the housing, feeding and dosing of smaller animals is much easier than larger animals, the BGI have developed such pigs for research into human diseases, using TALENs (transcription activator-like effector nucleases), to disable the growth hormone receptors of Bama pigs. Bama pigs are already a small breed of pig, but these animals are smaller when mature, at about 15kg.

The controversy has led to some science commentators being concerned that the media frenzy about such research will distract from any benefits that might accrue. Scientists who are themselves involved in such research are often the first to say they are being cautious for ethical reasons and that they need guidelines.

For example, David Cyranoski, writing in *Nature*, contacted Jens Boch of the Martin Luther University of Halle-Wittenberg in Germany, who helped to develop the gene-editing technique TALENs.

Boch says: "It's questionable whether we should impact the life, health and well-being of other animal species on this planet light-heartedly". Jeantine Lunshof, a bioethicist at Harvard Medical School in Boston, Massachusetts, says that such research is "stretching physiological limits for the sole purpose of satisfying idiosyncratic aesthetic preferences of humans".

Daniel Voytas, a geneticist at the University of Minnesota in Saint Paul, says: "I just hope we establish a regulatory framework – guidelines for the safe and ethical use of this technology – that allows the potential to be realized. I worry that pet mini pigs distract and add confusion to efforts to achieve this goal."

Cyranoski "agrees on the need to regulate gene editing in pets as well as in the medical research applications that make up the core of its micropig activities".

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Crystal Kim-Han, who runs a rescue operation for abandoned pigs near Las Vegas, Nevada, worries that if the animals are locked up in an apartment with no place to root or dig, they can become destructive. She also expects micropigs to have additional medical problems, similar to pets created by selective breeding. “What happens down the road when these animals need care?” she asks.

Yusuff Abdu, a researcher at the Skirball Institute of Biomolecular Medicine in New York, told Yasmin Tayag of Inverse: “This has to be regulated. You can’t let lab-engineered animals out into the public.

There is a high chance they could get into the wild and offset an ecosystem if they happen to have an advantageous trait. Lab rats and mice are kept out of pet stores for a reason.”

Donald M. Broom, Professor of Animal Welfare (Emeritus) at the University of Cambridge’s Centre for Animal Welfare and Anthrozoology, said that even conventional breeding has led to many major welfare problems for pets, and that genetic manipulation in particular “has risks for welfare, etc. and is much faster change than conventional breeding”. Moreover, “People modifying pets are unlikely to investigate using good welfare indicators”.

Stephen R.L. Clark, Emeritus Professor of Philosophy at the University of Liverpool, points out that in Britain such pigs would not be available either to farmers or pet owners until several generations have been bred successfully and healthily.

He also said that: “In Britain we've been opposed to genetic engineering for cosmetic or other luxury reasons precisely because such engineering almost always carries costs to the animals concerned, and such reasons don't seem serious enough even to people who think it OK to manipulate non-humans for other and more serious purposes.”

Clark also says that: “Breeding for a known result by more traditional means itself usually has bad ‘side effects’ (witness dogs, turkeys, etc.) but at least there the process is slower, and can be halted or redirected as really bad problems emerge. The point of direct interference in the genome is that it's faster – and may be too fast to allow modification before really bad effects happen. That's why we need to be very cautious in what we do. As more is known of the relevant genome we may be better placed to guess more what will happen: at the moment most engineering is still trial and error, without any grasp of why a particular effect occurs when a particular codon is amended or inserted.”

There have been many calls for a clear policy based on an open, ethical debate. “Regulations or not—voluntary or prescriptive – even professional bioethicists believe that it won’t be long before a lab comes up with a viable, edited human embryo,” says Eric Niiler in *WIRED magazine*.

He contacted Jennifer Doudna, a UC Berkeley cell biologist, who said that: “The science … is coming at us whether we want it or don’t, and given that science is global, we have to be confronting this right now.”

Concepts such as the “yuck factor” – the term used for the feeling of revulsion or disgust experienced by many concerned about the genetic manipulation of animals – and “the slippery slope” are used in this debate.

But clarity is needed about the ‘inevitable’ consequences to which the slide of events will move. ‘Fear mongering’ is the accusation used by those defending the work; however, sometimes the fear might be justified, but often this is not known without the benefit of hindsight. Slowness and reversibility in such ethical problems are the watchwords.

Concerning the “yuck factor”, Charles Fethy writes, “like most attention-grabbers, the shock value probably will not last for long. But although the word may lose its forcefulness, the fundamental sense of repugnance which the term expresses will not go away … it is important that we think carefully and philosophically about this feeling of revulsion and consider what role it might play in the serious moral judgments which science and technology are now forcing on us.”

Pig Health, Production Management, Pig Welfare, Genetics, Training & Development, Smallholder/Hobby farming

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