

Compassion in World Farming Factsheet

Farm Animal Cloning

Background

The first mammal cloned from an adult cell was Dolly the sheep in 1996. The process that created Dolly is called somatic cell nuclear transfer (SCNT). Since then, many other species have been cloned using SCNT, including cow, pig, goat, horse, mule, dog, cat, rabbit, mouse, rat, deer, buffalo, camel and ferret. Today there are estimated to be around 6000 farm animal clones worldwide.

The SCNT process involves removing the nucleus (which contains the DNA) from an egg cell and replacing it with the nucleus from a body cell taken from the donor animal. An electrical pulse is used to fuse the egg cell with its new nucleus and activate it to develop into an embryo. The embryo is then implanted in the uterus of a 'surrogate' mother animal. If the pregnancy is successful, the offspring that is born will be a clone of the donor animal.

Cloning technology is already being used commercially in some parts of the world for the replication of elite breeding animals, mostly cattle and also pigs, which are used to produce animals farmed for food production. Food from clones and their offspring is not yet on sale in the European Union but food products from the offspring of cloned animals have already entered the human food chain in the United States and some Asian countries.

Welfare issues

Cloning has very serious consequences for animal welfare, both as a direct result of the technology and through exacerbation of the health and welfare problems caused by selective breeding for high productivity. Further welfare concerns arise because the SCNT process can also be used to facilitate the development of genetically modified animals for food production purposes.

Welfare of clones

The large majority of cloned embryos fail to develop normally and die before the pregnancy reaches term. For those that survive to delivery, a significant proportion of the animals die during or shortly after birth or at various times over the following days and weeks of life from cardiovascular failure, respiratory problems, liver or kidney failure, immune system deficiencies or musculoskeletal abnormalities.

Clones may be born unusually large and with a range of health problems, termed "large offspring syndrome" (LOS). This is a common problem in cattle and sheep clones and is associated with increased mortality, abnormally large foetal size, abnormal placental development, enlarged internal organs, increased susceptibility to disease, reluctance to suckle, difficulty in breathing and standing and sudden death. LOS was first described in pregnancies with *in vitro*-fertilized embryos but it is much more common in clone pregnancies. In contrast to cattle and sheep clones, cloned piglets are more likely to suffer growth retardation during development, resulting in low birth weight and increased mortality.

Welfare of surrogate mothers

The welfare of animals used as surrogate mothers is also adversely affected. A large proportion of clone pregnancies fail, mainly due to abnormalities of the placenta. For those pregnancies that make it to term, the birth is often difficult and delivery is commonly by Caesarean section. The Caesarean can cause pain and anxiety for the animal and often they will not be provided with adequate pain relief following the operation.

Welfare of clone offspring

From the limited data available, it appears that the offspring of cloned animals do not suffer from any obvious abnormal effects. However, cloning is used commercially for the replication of elite high-yielding animals for breeding. Such animals already suffer from a range of serious health and welfare problems associated with selection for high productivity, such as increased levels of lameness, mastitis and infertility in dairy cows, lameness and calving difficulties in beef cattle, lameness and cardiovascular disorders in pigs and meat poultry, and bone weakness in laying hens. The use of cloning in commercial livestock breeding is therefore likely to accelerate the spread of genetics that are associated with poor welfare, leading to greater suffering from health and welfare problems connected with fast growth and high yields.

Other concerns

There are a number of other serious concerns associated with farm animal cloning, including a threat to the genetic diversity of the world's livestock, food safety and ethical concerns.

Threat to livestock genetic diversity

The world's livestock diversity is currently shrinking, with rapid and uncontrolled loss of unique and often uncharacterised animal genetic resources. The global spread of a small number of specialised breeds has been facilitated by the development of artificial reproductive technologies, particularly artificial insemination. Some suggest that cloning technology could be used to replicate individuals of rare and endangered livestock breeds, which could help to preserve genetic diversity. However, the commercial use of cloning to replicate elite breeding animals is likely to further contribute to the erosion of livestock genetic diversity.

Reduced genetic diversity increases the susceptibility of livestock populations to diseases and other risk factors. This raises the possibility of large numbers of animals succumbing to diseases to which they are susceptible, with potentially serious animal welfare, social and economic consequences.

Food safety and consumer concerns

Risk assessments carried out by the European Food Safety Authority and the US Food and Drug Administration suggest that products from cloned animals and their offspring are unlikely to carry increased food safety risks compared with conventional food products. However, there are limited data available and further studies, including long-term trials, would be needed to rule out any potential food safety issues from the consumption of products from cloned animals and their offspring.

Surveys of public attitudes to cloning in the EU and US show that most people do not agree with farm animal cloning. The majority of EU and US citizens state that they are opposed to animal cloning for food production purposes. The majority of EU citizens state that they would be unlikely to buy products from cloned animals or their offspring, even if they were shown to be safe. If food products from clones or their offspring were to become available in the EU, the vast majority of EU citizens believe that special labelling should be required.

A number of farmers' groups, for example in The Netherlands, Italy and New Zealand, have expressed concern at the threat to the image of the livestock industry if products from cloned animals or their offspring are permitted to enter the food chain, potentially leading to a loss of consumer confidence and associated economic consequences.

Expert opinion on farm animal cloning

A number of official advisory bodies have spoken out against the cloning of animals for food. The European Food Safety Authority Scientific Committee states:

“The health and welfare of a significant proportion of clones, mainly within the juvenile period for bovines and perinatal period for pigs, have been found to be adversely affected, often severely and with a fatal outcome.”

The European Group on Ethics in Science and New Technologies (EGE) concludes:

“Considering the current level of suffering and health problems of surrogate dams and animal clones, the EGE has doubts as to whether cloning animals for food supply is ethically justified... At present, the EGE does not see convincing arguments to justify the production of food from clones and their offspring”.

Regulation of farm animal cloning

Following the decision by the US Food and Drug Administration in 2008 that products from cloned animals are safe, food from clones and their offspring can freely enter the marketplace in the US and there is no requirement for these products to be labelled.

At present, there is no specific legislation governing farm animal cloning in the EU. In September 2008, the European Parliament adopted a resolution calling for a ban on:

- The cloning of animals for food supply purposes;
- The farming of cloned animals or their offspring;
- The placing on the market of meat or dairy products derived from cloned animals or their offspring;
- The importing of cloned animals, their offspring, semen and embryos from cloned animals or their offspring, and meat or dairy products derived from cloned animals or their offspring.

The main concerns cited by the Parliament are threats to animal welfare, genetic diversity, consumer confidence and the image and substance of the European agricultural model. Compassion in World Farming is calling on the European Union to follow the Parliament’s wishes and implement a ban.

Recommendations

You can help to limit the suffering of cloned farm animals in a number of ways:

- Join Compassion in World Farming’s campaigns or donate to our work at www.ciwf.org
- Write, email or call your local newspaper, radio or TV station and ask them to inform the public about the welfare problems involved in farm animal cloning;
- If cloned meat or milk is already approved for sale in your country, contact your local grocery shop and the retail chains to ask for clear labelling of ‘clone-free’ products – this will enable consumers to avoid products from clones and their offspring if they have concerns on welfare or ethical grounds;
- If cloned meat or milk is not yet on sale in your country, contact your local grocery shop and the retail chains to tell them your concerns about farm animal cloning and ask them not to start stocking meat or milk from cloned animals or their offspring;
- For the UK, you can find out more about the policies of the major supermarkets on cloning from Compassion in World Farming’s supermarket survey at www.ciwf.org.uk/supermarkets

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Sources and further reading

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