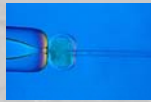


The Ethics of Animal cloning



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CLONING IN PUBLIC

Farm animal cloning and the public – A project to facilitate a European public debate and to make recommendations on regulation and on guidelines for research and applications of farm animal cloning



A specific support action within the 6th framework programme, priority 5: Food quality and safety
Coordinator: Danish Centre for Bioethics and Risk Assessment (C-BIRA)



PLAN

- Animal cloning – state of the art
- Public perceptions
- Ethical considerations
- Conclusions

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But first:

- **Why focus on ethics?**

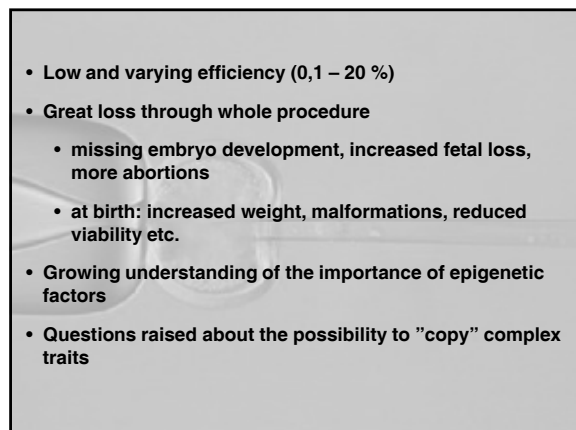
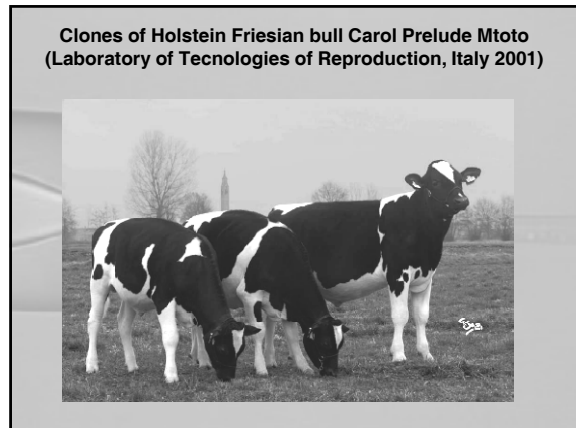
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- **Marketing**
 - To a certain extent it pays off to be ethical
 - To a certain extent it pays off to seem ethical
- **Prudence**
 - Reflecting on ethical issues is a way to prepare for the future and insure investments
- **Conscience**
 - Almost all people desire to be good and do good
 - To do ethics is to seek to navigate responsibly in a complicated world

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Pig cloning in Denmark

Sow no. (12)	No. of cloned embryos	No. of born piglets	No. of living piglets after 1 week
1327	54	3 (08/06-06)	3
1539	46	10 (21/06-06)	10
1309	58	4 (16/08-06)	1
1433	202	2 (08/07-06)	2
1553	89	3 (28/09-06)	2
1452	85	6 (30/10-06)	5
1867	68	7 (28/08-07)	7
1777	70	1 (29/08-07)	1
1856	56	2 (29/08-07)	2
1904	60	3 (18/01-08)	3
2002	57	4 (30/01-08)	1
1955	65	7 (13/02-08)	1
Total	910	52 (5,7%)	38 (4,2%)

Applications

- Cloning is used as an enabling technology for the production of genetically modified animals for use in biomedical research and in "pharming"
- Cloning is useful in some forms of basic research – especially foetal development and reproduction
- So far relatively few attempts to commercially utilise cloning in farm animal breeding – and none in Europe
- Agricultural cloning met with scepticism from consumers, regulatory system and breeders (European Forum for Farm Animal Breeders).

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Public perceptions

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EUROPEAN ATTITUDES TO BIOTECHNOLOGY

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- Since 1991 the Eurobarometer surveys have examined the attitudes of the European public
- According to my interpretation of the surveys members of the European public
 - Differentiate between medical and agricultural applications
 - Do not become more positive towards biotechnology the more they know about it
 - The knowledge deficit model
 - Are most sceptical towards biotechnology when it is applied to animals or food-production

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Organism

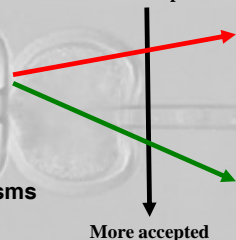
- Human
- Animal
- Plant
- Micro-organisms

Less accepted

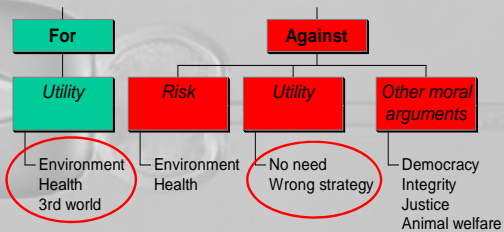
Use

- Food
- Agriculture
- Health/Environment
- Medicine

More accepted



Arguments for and against biotechnology



Animal Cloning and Implications for the Food Chain

Findings of Research Among the General Public

1st May 2009/ Job No: 5558/ Version 3

Conclusions

The key areas of concern that participants expressed are summarised below:



Based on this research, if the general public are to accept the idea of buying and eating food derived from clones and their offspring, each of these concerns would need to be addressed.

Animal Cloning and Implications for the Food Chain: Findings of Research Among the General Public

Creative Commons

The Knowledge Gap Model

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- The discrepancy between the opinion of experts and the opinion of the public regarding the risks of agricultural biotechnology are caused by a *lack of knowledge* in the public and can be dissolved by *information*

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- It is thus often claimed by scientists, representatives of industry and civil servants that people do not accept biotechnology because they lack knowledge
- However, sociological studies have not been able to verify the view that there is a clear connection between level of knowledge and acceptance
- Some of the very negative populations in Europe have a relatively high level of knowledge, and some of the populations with a low level of knowledge have a relatively positive attitude
- Information helps opinion formation

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Ethical considerations

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Three groups of concerns

- Concern for humans
 - Biosafety
 - Slippery slope concerns
- Concern for society
 - Industrialisation of agriculture
 - Estrangement from food products
- Concern for animals
 - Animal welfare
 - Animal integrity

Official reports

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www.efsa.europa.eu

Antimicrobial Resistance | Biotechnology | Aquaculture | Food Safety | BSE | Guidance Documents | Green Book | Freedom of Information

CVM and Animal Cloning

PDF documents may be read with a free copy of the [Adobe Acrobat Reader](#). Excel documents can be read with a free copy of [Microsoft's Excel viewer](#).

by Google

Table of Contents

- Introduction
- What is FDA doing?
- News Updates
- Consumer Health
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Introduction

In 2001, when it became apparent that animal cloning may become a commercial venture to help improve the quality of herds, FDA requested livestock producers and researchers to keep food from animal clones or their offspring out of the food supply. Since then, FDA has conducted an intensive evaluation that included examining the safety of food from these animals and the risk to animal health.

Based on a final risk assessment, a report written by FDA scientists and issued in January 2008, FDA has concluded that meat and milk from cow, pig, and goat clones and the offspring of any animal clones are as safe as food we eat every day.

efsa

European Food Safety Authority

Draft Opinion for Public Consultation

DRAFT Scientific Opinion on Food Safety, Animal Health and Welfare and Environmental Impact of Animals' derived from Cloning by Somatic Cell Nucleus Transfer (SCNT) and their Offspring and Products Obtained from those Animals

DRAFT Scientific Opinion of the Scientific Committee

(Question No EFSA-Q-2007-092)

Endorsed for public consultation on 19 December 2007

SCIENTIFIC COMMITTEE MEMBERS

Sue Barlow, Andrew Chesson, John D. Collins, Erik Dybing, Albert Flynn, Claudia Fruijtier-Polloth, Anthony Hardy, Ada Knaap, Harry Kuiper, Pierre Le Neindre, Jan Schaas, Josef Schlatter, Vittorio Silano, Staffan Skerfving and Philippe Vannier.

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ULTIME

Arrivano i "voucher" per la vendemmia 2008

Ethics group warns of animal welfare implications of cloning

In the opinion, the EGE cites the fact that cloning still has a relatively low efficiency and 'leads to high perinatal and postnatal disease and mortality of cloned organisms'

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The European Group on Ethics (EGE) has advised against the production of food from cloned animals and their offspring on animal welfare grounds, in an opinion published on 16 January, the group writes: '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.'

In the opinion, the EGE cites the fact that cloning still has a relatively low efficiency and 'leads to high perinatal and postnatal disease and mortality of cloned organisms'. Abnormalities observed in cloned animals include increased weight, malformations, reduced viability at birth, respiratory problems, enlarged foetal liver, epidermal haemorrhages and kidney abnormalities. Further research is needed to investigate the health of the descendants of cloned animals.

Three groups of concerns

- Concern for humans
 - Biosafety
 - Slippery slope concerns
- Concern for society
 - Industrialisation of agriculture
 - Estrangement from food products
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 - Animal welfare
 - Animal integrity

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- Slippery slope: Will animal cloning lead to human cloning?
 - Legally and practically a distinction can be upheld
 - The better we get at cloning mammals, the easier it will be to clone humans
- Increased industrialization of agriculture
 - Will cloning add to the development of fewer and larger companies within the breeding industry and fewer and larger animal producers?

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Three groups of concerns

- Concern for humans
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Estrangement from food products

- To some the quality of the product is also decided by the process behind it: The history it tells
- Values like naturalness, unprocessed, non-technological, as in the old days plays a role here
- Cloning signals a degree of human interference with the product which is unsatisfactory



What is Integrity ?

- Integritas: Wholeness, intactness
- Problem:
 - Reducing the animal to a mere product, a thing to design to be as useful as possible
 - Cloning extends an ongoing development - The straw that broke the camel's back
 - Could lead to increased criticism of existing breeding practices – which are largely unknown to the public.



Animal integrity



What is ethically acceptable?

- The debate must allow all concerns to be heard and discussed. However, it is unlikely that there will be consensus
- Two main views:
 1. Cloning is a technology like any other and should be allowed as long as it is safe
 2. Cloning is ethically problematic and should only be allowed if substantial benefits are at stake, i.e. for biomedical and basic research but not for food production
- A disagreement about values – not facts



Conclusions



- Biological realities do not match technical dreams when it comes to animal cloning
- The consumption of meat and other products from cloned animals or their offspring seems to pose no risk
- However, difficult to see serious benefits from a public perspective (wrong strategy)
- Cloning of animals for agricultural purposes will be met with scepticism by the European public
- Serious ethical concerns regarding welfare and integrity of the involved animals



THREE POSSIBLE DEVELOPMENTS

1. Basic research and biomedicine applications in and outside the EU
2. Basic research and biomedicine applications in and outside the EU, and agricultural applications outside the EU
3. Basic research, biomedicine and agricultural applications in and outside the EU

AT PRESENT 3. SEEMS LESS LIKELY THAN 1. AND 2.



Thank you for your attention

