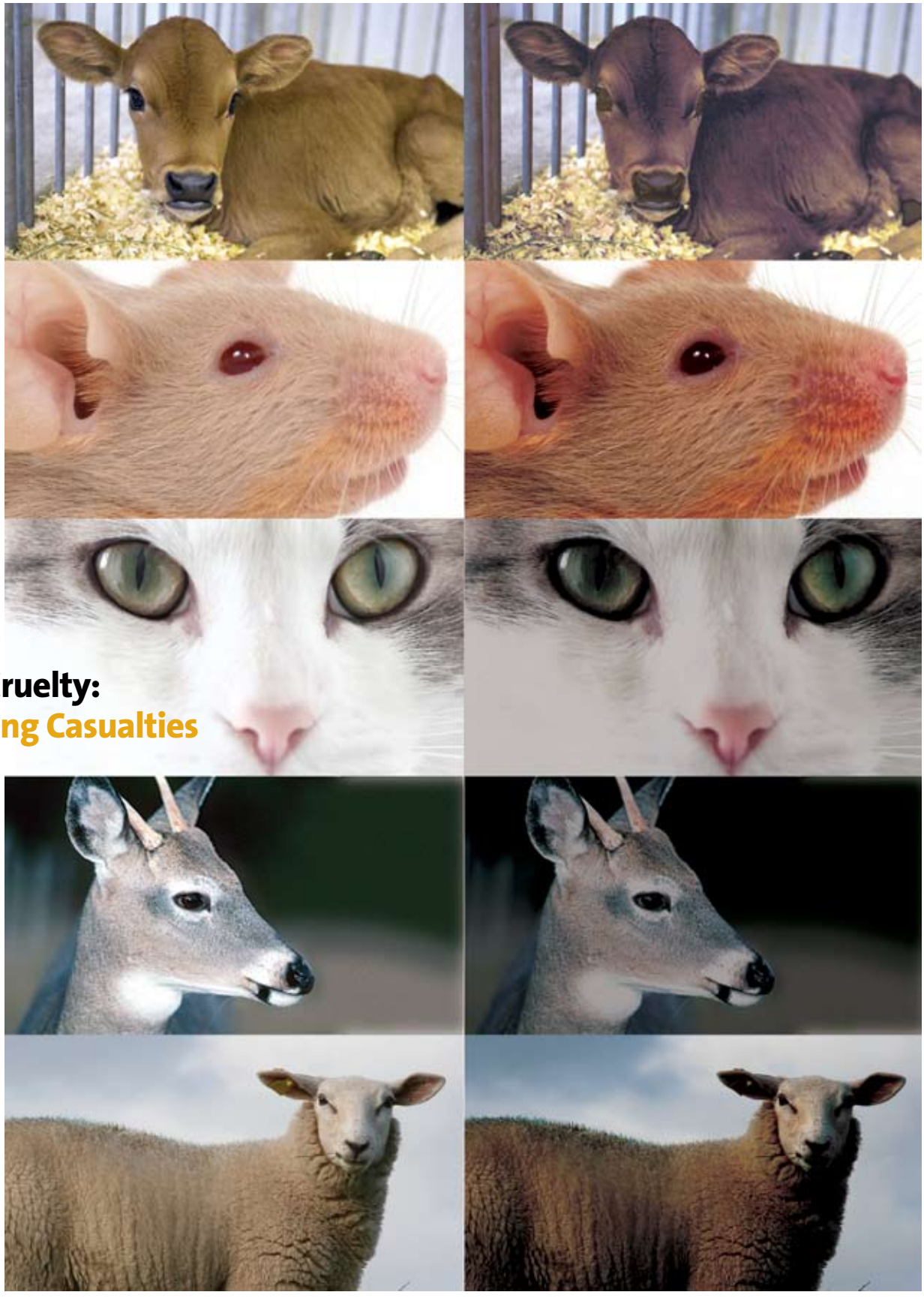
AV MAGAZINE

A PUBLICATION OF THE AMERICAN ANTI-VIVISECTION SOCIETY

SPRING 2007



Double the Cruelty:
Animal Cloning Casualties

Managing Editor
Crystal Schaeffer
Copy Editor
Julie Cooper-Fratrik

STAFF
Tracie Letterman, *Esq.*,
Executive Director
Jeanne Borden,
Administration Assistant
Chris Derer, Membership Coordinator
Laura Ducceschi, Education Director
Heather Gaghan, Director of Development & Member Services
Nicole Green, Assistant Director of Education
Vicki Katrinak, Policy Analyst
Nina Mak, Research Analyst
Nicole Perry, Outreach Coordinator
Crystal Schaeffer, Outreach Director
Julie Sinnamon, Office Manager
Lauren Zaprala, IT Manager & Graphic Designer

GRAPHIC DESIGN/ILLUSTRATION:

The *AV Magazine* (USPS 002-660) is published quarterly under the auspices of the American Anti-Vivisection Society, Sue Leary, President. Annual membership dues: $25 .00. Third-class postage paid at Lancaster, Pa.

Office of Publication:
801 Old York Rd., #204
Jenkintown, PA 19046-1685
Telephone: (215) 887-0816
Fax: (215) 887-2088
E-mail: aavs@aavs.org
Website: www.aavs.org

When sending funds or making bequests, please use our legal title:

The American Anti-Vivisection Society
801 Old York Rd., #204
Jenkintown, PA 19046-1685

Organized and established in 1883.

Printed on recycled paper.

VOLUME CXV, NUMBER 2 ISSN 0274-7774

Contents

FEATURES

COLUMNS

Who Are We?

Founded in 1883, the American Anti-Vivisection Society (AAVS) is the oldest non-profit animal advocacy and educational organization in the United States dedicated to ending experimentation on animals in research, testing, and education. AAVS also opposes and works to end other forms of cruelty to animals. We work with students, grassroots groups, individuals, teachers, the media, other national organizations, government officials, members of the scientific community, and advocates in other countries to legally and effectively end the use of animals in science through education, advocacy, and the development of alternative methods to animal use.

AAVS has two main divisions, each involved in specific activities. Animalearn is the education program of AAVS, which focuses on ending vivisection and dissection in the classroom. From elementary through college levels, Animalearn helps countless individuals make their classrooms more humane. Animalearn operates the most aggressive dissection alternatives lending library in the country, The Science Bank; it provides alternatives to using animals, from basic dissection, through psychology experiments. Animalearn also participates in national teacher conferences and hosts workshops to help teachers learn ways of educating without harming other living creatures. Animalearn's National Humane Educators Network links interested parties with speakers across the country, bringing the message of humane education to thousands.

The Outreach division of AAVS educates the general public about animal issues through one of the top-rated literature collections in the animal advocacy movement and the informative AAVS website. Our quarterly publication, *AV Magazine*, and bi-monthly newsletter, *Activate For Animals*, provide comprehensive up-to-date information on the scientific and ethical dimensions of animal experiments and alternatives. Both publications encourage AAVS members and supporters to become actively involved in our campaigns. Outreach staff also travel to speaking engagements and conferences and place advertisements in national publications to spread the AAVS message across the country.

The Alternatives Research & Development Foundation (ARDF), an affiliate of AAVS, awards grants to scientists and educators working to develop non-animal methods of investigation. ARDF's unique program provides the necessary resources for the development of alternatives to the use of animals, and it advocates the use of alternatives through the internet and by participating in conferences and seminars. Through these endeavors, ARDF works to promote scientific solutions for today with humane visions for the future.

We ask you to become a member of AAVS and help us to end the use of animals in science through education, advocacy, and the development of alternative methods. It is only through the support of members and other individuals that we are able to continue our vital and successful programs.

American Anti-Vivisection Society

FIRST WORD

As a leader in the animal protection community on animal research issues, AAVS is spearheading the efforts against animal cloning. This cruel and highly experimental technology causes severe animal suffering for the animals who go through the cloning process. Death and deformities in cloned animals is the norm, not the exception. In fact, 96-99 percent of cloned animals do not survive beyond six months.

Unfortunately, the biotechnology industry is intent upon moving this technology from the laboratory to the market place. These powerful organizations would like to clone everything from your deceased companion cat or dog to the farm animals used for meat and milk. Despite the push by the industry to bring cloned animals to the market, the public does not want to purchase cloned animals or cloned animal products. (see survey on page 9) AAVS strives to continue educating the public about the negative, inhumane effects of cloning and ensure that the public's voice is heard on this issue.

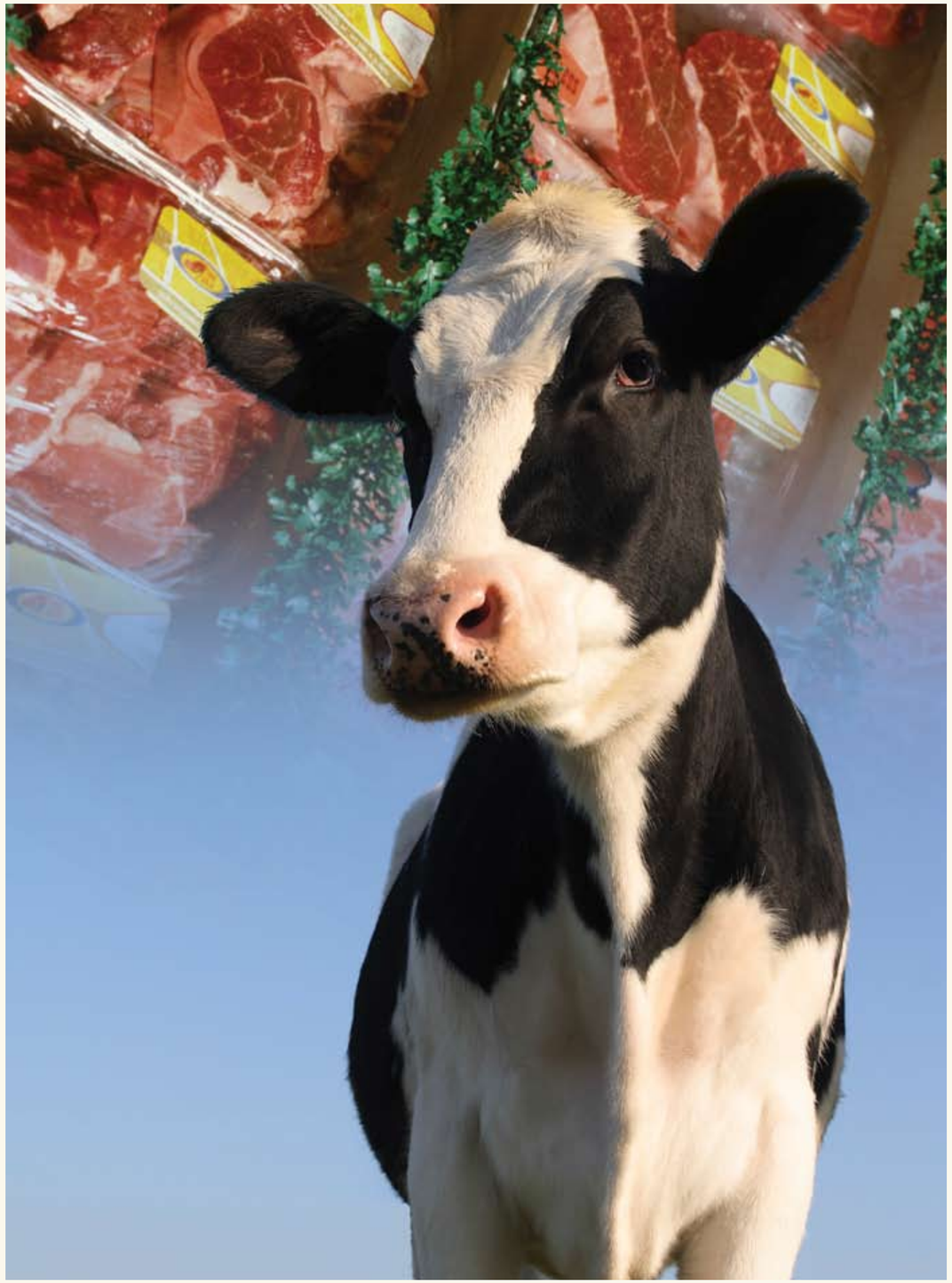
In 2005, AAVS launched its No Pet Cloning campaign to bring the dangers of pet cloning to the public's attention. As a result, the only company to sell cloned cats closed its doors at the end of 2006 after selling only two cats. The demise of this industry demonstrates that animal suffering does not lead to profit. This closure should send a message to other companies looking to sell cloned animals: American consumers are not interested.

In 2006, we expanded our efforts to prevent cloned farm animals from entering the market. FDA is considering allowing milk and meat from cloned animals and their progeny to be sold to consumers. In response to FDA's Draft Risk Assessment that analyzed the cloning risks to human health and animal health, AAVS, in coordination with animal protection, consumer, and environmental organizations, was able to activate the public to submit over 145,000 comments opposing the approval of cloned animals for food. AAVS submitted a 47-page document responding to each part of the Draft Risk Assessment in which the agency failed to accurately and appropriately analyze the data, characterize risks, and draw logical conclusions. The scientific evidence is undisputable: animals involved in cloning are at a significantly increased risk of suffering from severe illnesses and death. Given these risks, there is no good reason to buy or sell cloned animals or cloned animal products.

We all know that it can be emotionally devastating to lose a companion animal. After all, these animals are members of our family. There are other ways besides cloning, however, to bring a new animal into our lives. For example, if you are looking to replace a deceased cat with a similar looking cat, you should look to your local shelter or our website, which links to www.PetFindercom. As for cloned farm animals, the animal advocacy community is already struggling to reduce the intense and inhumane practices on factory farms. Do we really want to add another layer of cruelty to the animals raised for food?

AAVS has been involved with the animal cloning debate from the beginning, before this technology has been approved for food by the government and silently incorporated into our daily life. At this critical point, we have an opportunity to stop this technology and save millions of animals from going through the cloning process and experiencing terrible suffering. We need your help in highlighting the animal welfare concerns with animal cloning to agency officials, state and federal representatives, industry groups, and friends and families. Please check out our website (www.EndAnimalCloning.org) and the *Activate For Animals* newsletter for the latest information on how you can help. Just because we *can* clone animals for use as pets or as food does not mean that we *should*.

Tracie Letterman



Out of the Lab and Into Our Grocery Stores?

The problems with cloning animals for food

By Nina Mak, MS,
AAVS Research Analyst

The decision to allow or prohibit the cloning of animals for food is far more consequential than most people realize. Yet the Food and Drug Administration (FDA) chose to announce its decision to give a preliminary go-ahead to animal cloning on December 28, 2006, a time of year when most news is likely to be overlooked by a preoccupied public. In addition, while many people are looking for accurate, reliable information about animal cloning in an attempt to understand this ethically-challenging technology, the FDA and the biotech industry have been misrepresenting the facts and confusing the debate.

As part of our campaign to end animal cloning, AAVS aims to bring clarity to these issues, as well as highlight a serious problem that has generally been overlooked in the discussions on cloning: animal welfare. Cloning need not be too complicated to understand. In fact, the overall message from all the scientific studies on cloning is remarkably clear: cloning is inefficient and unpredictable, resulting in premature death or severe health problems for more than 95 percent of the animals involved.[1] In response, AAVS has launched its End Animal Cloning campaign to prevent the needless animal suffering that cloning causes and to inform the public about the cruel effects of this experimental technology.

An Overview of Cloning

Cloning is the term commonly used to refer to a procedure known as somatic cell nuclear transfer (SCNT), the procedure which was first used to create Dolly the sheep in 1996.[2] In SCNT, the genetic material (DNA) of an egg is replaced with the DNA from a donor animal, and the egg is then stimulated to develop into a nearly identical copy of the donor. (please see page 8) Since Dolly, researchers have cloned a number of different animals, including cows, pigs, goats, horses, mice, cats, and dogs.[3] The process is far from perfected, however, with only 1-4 percent of cloning attempts succeeding.[4]

Cloning for breeding purposes

Agriculture researchers are currently interested in cloning livestock primarily for breeding purposes, in an attempt to create copies of 'valuable' animals. Farmers commonly use the animals who have the best genetics for some desired quality such as fast growth, leaner meat, or high milk production as breeding animals to produce offspring who will have similar qualities. By cloning these 'top' breeders, farmers are trying to extend their reproductive potential and create whole herds or flocks with these uniform characteristics.[5]

However, cloning highly productive animals exacerbates animal welfare concerns, because these animals tend to suffer from painful infections of the udder, lameness, and other 'production-related' diseases. In addition, cloning raises concerns about genetic diversity, because herds of identical animals are more susceptible to disease outbreaks. Overall, cloning requires a significantly greater level of involvement and interference with animals' reproductive performance than conventional production methods, which raises unprecedented concerns and ethical challenges that fly in the face of the public's interest in animal welfare and humane treatment of farm animals.

Cloning and transgenic animals

Perhaps even more important, cloning is also used to produce copies of transgenic animals. Transgenic animals are those who most likely have been engineered with genes from another species for any of a variety of purposes: to have better traits for production (such as faster growth, disease resistance, altered milk or meat products with 'health benefits' for humans, etc.); to produce pharmaceuticals in their milk, blood, urine, or semen (pharming); or to produce tissues and organs for transplantation into humans (xenotransplantation).[6,7,8] If animal cloning is approved, the generation and proliferation of transgenic animals are likely to become major applications of cloning technology. Clearly, such implications raise numerous troubling ethical questions, which cannot be ignored in the decision-making process on cloning.

Threats to Animal Health and Welfare

The remarkable inefficiency of cloning poses immediate threats to animal welfare. Fewer than one percent of cloning attempts will result in a successful birth, and of those who are born, only a relatively small percentage are healthy enough to live for more than a few days or weeks.[9,10] With such low success rates, not only do the cloned animals endure suffering, but so do hundreds of additional animals as they are pumped with hormones and their eggs harvested, or as they are implanted with embryos, often repeatedly, in an attempt to produce just one cloned animal who survives.

Problems afflicting surrogate mothers and their fetuses

According to the FDA's recently published analysis of animal cloning risks, abnormal fetal development is common

▸▸

in clones, which translates into abnormal pregnancies with a host of complications that threaten the lives of the unborn clones and their surrogate mothers.[11,12] For example, a typically fatal condition known as hydrops, in which the mother and/or the fetus swells with fluid, occurs frequently in clone pregnancies. From the data presented by the FDA, hydrops has occurred in 28 percent of clone pregnancies, with one study (conducted by Cyagra, a biotech company leading the push for cloned foods)[13] reporting hydrops in over 50 percent of cases. In contrast, hydrops occurs rarely or never in pregnancies produced through artificial insemination or natural breeding.[14]

Clone pregnancies are also associated with a greater risk of late term loss, with roughly 45 percent of pregnancies reported lost in the second or third trimester in studies at a research farm in France.[15] Such losses, normally uncommon in conventional pregnancies, "expose the recipients [surrogates] to conditions that threaten their welfare."[16]

Problems afflicting cloned newborns

Based on published data and the FDA's own report, it is clear that abnormalities are also the norm, not the exception, for the few cloned animals who survive birth. Cloned animals suffer from respiratory distress; hypoglycemia; weakened immune systems; developmental problems; deformities; malformed livers, kidneys, or hearts; and a variety of ailments that claim the lives of approximately one-third of neonates (newborns).[17]

Many of these ailments are related to Large Offspring Syndrome (LOS), a commonly observed problem with cloned animals in which the animal develops to be significantly bigger at birth than a conventional animal. It is not uncommon for the animal to be twice the normal size, and in one study, a lamb was reported as being five times larger than normal.[18] In fact, LOS occurred in over 50 percent of calf clones included in the FDA's report, compared to 6 percent of conventionally bred animals.

In addition, according to a recent study conducted by Cyagra, 75 percent of cloned calves required antibiotics, and almost half of the cloned animals who survived birth died within the first five months, despite access to extensive veterinary care, and despite the fact that any of more than 10 different interventions were performed.[19]

Problems afflicting adult clones

Even the few cloned animals who live for longer than 6 months and appear otherwise healthy have been known to suffer unexpected health consequences later in life. Studies in cows, for example, have documented cases of sudden, unexplained deaths and subclinical pathologies that had gone undetected.[20] In fact, in an article recently published in *The New England Journal of Medicine*, Rudolf Jaenisch, a prominent MIT cloning researcher, stated that "given the available evidence, it may be exceedingly difficult, if not impossible, to generate healthy cloned animals…."[21]

In addition, AAVS is monitoring and supporting legislative efforts to require that cloned foods, if they are approved for sale, be labeled as such.

AAVS's Campaign

With such obvious and overwhelming health problems routinely reported in cloned animals, it is clear that cloning seriously threatens animal well-being. While the FDA chooses to deflect focus from this fact, skirting the issue by avoiding discussion on the tremendous frequency with which these problems occur, AAVS is actively working to inform the public about these hidden costs of cloning.

Clearly, questions about the impact of cloning on animal welfare have yet to be adequately addressed, much less resolved. This is despite the fact that 63 percent of Americans want the government to factor in ethical considerations when making a decision on animal cloning.[22] As a result, AAVS has petitioned the FDA and is working with Congress, in conjunction with the Center for Food Safety and numerous other consumer, animal advocacy, and environmental organizations, to establish a forum for the public discussion of these issues, and to instate a mandatory moratorium on the sale of cloned foods in the meantime.

In addition, AAVS is monitoring and supporting legislative efforts to require that cloned foods, if they are approved for sale, be labeled as such. (see sidebar next page) Labels are important to help consumers make informed decisions about their food purchases, especially the majority of Americans, who have ethical, religious, or safety concerns about cloning and want to avoid cloned foods. (see page 9)

Cloning is remarkably inefficient and unpredictable yet also highly consequential. The FDA should not allow cloning to proceed without any regulations and concern for the welfare of the animals involved.

How You Can Help

AAVS has submitted extensive comments to the FDA detailing our concerns about animal welfare and the FDA's faulty handling of this issue. (see page 6) We are also working with Congress to ensure that an ethical discussion is held publicly and openly before any decision is made regarding cloned animals. In these ways, we hope to get animal cloning prohibited. Please support our efforts by contacting your Congressional legislators and voicing your opposition to animal cloning. Visit www.senate.gov and www.house.gov to locate and write to your legislators. **AV**

RESOURCES

[1] Paterson, L. (2002). *Somatic Cell Nuclear Transfer (Cloning) Efficiency.* Retrieved Oct. 2006, from http://www.roslin.ac.uk/downloads/webtablesGR.pdf.

[2] Campbell, K.H., McWhir, J., Ritchie, W.A., & Wilmut, I. (1996). Sheep cloned by nuclear transfer from a cultured cell line. *Nature, 380,* 64-66.

[3] Ortegon, H., Betts, D.H., Lin, L., Coppola, G., Perrault, S.D., Blondin, P., et al. (2007). Genomic stability and physiological assessments of lived offspring sired by a bull clone, Starbuck II. *Theriogenology, 67*(1), 116-126.

[4] Paterson, L. (2002). See note 1 above.

[5] Vajta, G., & Gjerris, M. (2006). Science and technology of farm animal cloning: State of the art. *Animal Reproduction Science, 92,* 211-230.

[6] Vajta & Gjerris (2006). See note 5 above.

[7] Paterson, L., DeSousa P., Ritchie W., King T., & Wilmut, I. (2003). Application of reproductive biotechnology in animals: Implications and potentials. *Animal Reproduction Science, 79*(3-4), 137-143.

[8] The FDA currently regulates transgenic animals as "new animal drugs."

[9] Paterson, L. (2002). See note 1.

[10] Wilmut, I., Beaujean, N., de Sousa, P.A., Dinnyes, A., King, T.J., Paterson, L.A., et al. (2002). Somatic cell nuclear transfer. *Nature, 419,* 583-587.

[11] Food and Drug Administration (2006). Animal Cloning: A Draft Risk Assessment, 107-116.

[12] See also: Heyman, Y., Chavatte-Palmer, P., LeBourhis, D., Camous, S., Vignon, X., & Renard, J.P. (2002). Frequency and occurrence of late-gestation losses from cattle cloned embryos. *Biology of Reproduction, 66,* 6-13.

[13] Panarace, M., Agüero, J.I., Garrote, M., Jauregui, G., Segovia, A., Cané, L., et al. (2007). How healthy are clones and their progeny: 5 years of field experience. *Theriogenology, 67*(1), 142-151.

[14] FDA (2006); Panarace, et al. (2007). See notes 11 and 13 above.

[15] Heyman, Y., Chavatte-Palmer, P., LeBourhis, D., Camous, S., Vignon, X., & Renard, J.P. (2002). Frequency and occurrence of late-gestation losses from cattle cloned embryos. *Biology of Reproduction, 66,* 6-13.

[16] Chavatte-Palmer, P., Remy,D., Cordonnier, N., Richard, C., Issenman, H., Laigre, P., et al. (2004). Health status of cloned cattle at different ages. *Cloning and Stem Cells, 6*(2), 94-100.

[17] Vajta & Gjerris (2006); FDA (2006), 116-127. See notes 5 and 11 above.

[18] Young, L.E., Sinclair, K.D., & Wilmut, I. (1998). Large Offspring Syndrome in cattle and sheep. *Review of Reproduction, 3,* 155-163.

[19] Panarace, et al. (2007). See note 13 above.

[20] FDA (2006), 127-135, 147-149. See note 11 above.

[21] Jaenisch, R. (2004). Human Cloning – The Science and Ethics of Nuclear Transplantation. *New England Journal of Medicine, 351,* 2787-2791.

[22] Public Sentiment About Genetically Modified Food (2005). Pew Initiative on Food and Biotechnology Survey Results. Retrieved Oct. 2006, from http://pewagbiotech.org/research/2005update/.

Certified Inhumane: The Cloned Food Labeling Act

Federal legislators took quick action in response to the Food and Drug Administration's (FDA) announcement that milk and meat from cloned animals are safe for human consumption. Senator Barbara Mikulski (D-MD) and Representative Rosa DeLauro (D-CT) introduced the Cloned Food Labeling Act (S. 414 & H.R. 992), which would require proper labels to be affixed to any food that comes from a cloned animal or its progeny. This legislation specifically requires the FDA and the Department of Agriculture to mandate that all food that comes from cloned animals be labeled as follows: "THIS PRODUCT IS FROM A CLONED ANIMAL OR ITS PROGENY."

American consumers are increasingly concerned about how foods are produced and are making purchases that reflect these ethical choices. The success of the organic foods industry and the proliferation of foods with labels declaring products to be "humanely raised" or "cage-free" is evidence of this consumer trend.

Recent polls show that food safety is only one of the many concerns that consumers have about animal cloning. A 2002 Gallup poll found that 64 percent of Americans think that cloning is "morally wrong," while a 2005 survey conducted for the International Food Information Council found that 63 percent of Americans would not buy cloned food even if it were labeled as "safe." According to these polls, consumers do not want to buy cloned animal products. Therefore, if a labeling law is passed, there should not be a market for cloned foods, which would put an end to this cruel industry.

Addressing the Senate upon introduction of S. 414, Senator Mikulski urged, "Americans must be able to speak with their dollars and choose the food they have confidence is safe." The Cloned Food Labeling Act will allow consumers to make educated and ethical choices about the products they are buying.

Please contact your Senators and Representative and tell them that you are opposed to animal cloning and do not want to buy cloned animal products. Urge them to support The Cloned Food Labeling Act (S. 414/H.R. 992). To find your U.S. Senator, log onto www.senate.gov; and to find your U.S. Representative, log onto www.house.gov; or call (800)688-9889 to get the names and addresses of your federal legislators. **AV**

Serious Flaws in the FDA's Assessment of Animal Cloning Risks

By Nina Mak, MS,
AAVS Research Analyst

For over ten years, the Food and Drug Administration (FDA) has been considering allowing cloned animals into the food supply. Despite cautionary warnings from the agency's own Veterinary Medicine Advisory Committee and the National Academy of Sciences, the FDA announced in December 2006 that it had completed its Draft Risk Assessment on animal cloning and concluded that milk and meat from cloned animals and their offspring are safe to eat. In addition, the agency concluded that cloning poses no unique risks to animal health, and that cloned animals older than six months are as healthy and normal as conventionally bred animals[1] and produce normal offspring.

The FDA's assessment, however, is seriously flawed and suffers numerous problems. Throughout the Risk Assessment, the FDA manipulates data and overstates its conclusions to obscure the risks and animal suffering involved with cloning. The FDA disregards the overwhelming evidence detailing the health problems consistently observed in clones, and fails to accurately characterize the nature, frequency, and severity of the risks that the animals involved in the cloning process face.

Such a risk assessment is completely unacceptable. AAVS has submitted comments to the FDA identifying the errors and inadequacies in the agency's report, and has recommended a mandatory ban on the sale of cloned animals for food. Below is a summary of AAVS's main points.[2]

Cloning causes serious health problems and premature death for the vast majority of animals involved in the process, far more so than any conventional method of animal production, including natural breeding and assisted reproductive technologies (ARTs).

Numerous published studies report that fewer than 95 percent of cloning attempts result in a live, relatively healthy animal.[3] For every 100 cloned embryos that are created, 80 or more will die during gestation. Of the few clones who are carried to term, approximately 20 percent will die during birth, and almost one third (30 percent) will die before reaching six months of age because of a serious health problem or deformity.[4,5,6,7]

The FDA dismisses all of these findings by stating that clones do not suffer from any risks that are not also seen in animals produced using conventional methods. This conclusion, however, neglects to consider that the risks to cloned animals are substantially greater than to animals produced by conventional methods because the risks occur much more frequently with cloning.

The FDA disregards the overwhelming evidence detailing the health problems consistently observed in clones, and fails to accurately characterize the nature, frequency, and severity of the risks that the animals involved in the cloning process face.

Clones, in fact, are far more likely to suffer from premature death and health problems than conventionally bred animals. For example, while roughly one third of neonatal clones die young, fewer than five percent of conventional bred newborns die before reaching maturity. In addition, hydrops, a typically fatal condition in which the animal swells with fluid, occurs in 28 percent of clones, but rarely in the general population of cattle (one of 7,500 pregnancies, far less than one percent). Large Offspring Syndrome, also a typically fatal condition that is associated with a host of complications, occurs in over 50 percent of clones but in fewer than six percent of conventionally bred animals.[8] Finally, the FDA even admits that cow cloning is unique among ARTs because pregnancy loss occurs at all stages of gestation.

Clearly, when health problems occur at such an alarming rate, and when those problems are often severe and fatal, the risks that cloned animals face can hardly be considered comparable to those faced by conventionally produced animals. The FDA, however, obscures and mischaracterizes the animal health risks associated with cloning by ignoring the tremendous increase in frequency with which they occur.

Cloning is not improving over time.

Reviewing cloning studies over the past 10 years, it is clear that mortality rates have remained consistently high.[9] At several points, however, the FDA downplays the animal health risks associated with cloning by claiming that "the situation appears to be improving as the technology matures."[10] This is a gross misrepresentation of the state of cloning. In fact, leading MIT cloning researcher Rudolf Jaenisch has been quoted as saying, "There's been zero progress. I mean it. Zero. The only thing we've begun to realize is how big the problem is…[11] and another cloning researcher, Peter Mombaerts of Rockefeller University, has stated that his best hopes for an "extremely efficient" version of cloning would have only a 20-30 percent success rate.[12] Contrary to the FDA's conclusion, the scientific data consistently shows that survival rates of cloned animals is not increasing.

There is little data on the health and reproductive function of adult clones, and what little data exist suggest that clones continue to be abnormal as they get older and may face additional, undiscovered risks.

There is very limited data concerning mature and aging clones, as cloning is still relatively new, and few clones have lived long enough to study. There are, however, findings that demonstrate that juvenile clones suffer from a "much higher rate" of health problems than conventional animals, and that adult clones sometimes die suddenly with no clinical symptoms.[13] Other findings, including blood and hormone values reported by the FDA, indicate that there may be further abnormalities with clones that have so far gone undetected. Reproductive difficulties, including reduced fertility and aborted pregnancies, have also been documented in cloned animals. The FDA's conclusions that clones older than six months are healthy and normal are clearly overstated and unsupported by the data. With so little data available, it is difficult, in fact, to assert anything about the health of these animals with any confidence.

There is a lack of data analyzing the progeny of clones or cloned food animals other than cows. More information is need regarding animals such as pigs, sheep, and goats.

Very little evidence is available on the health of pig, sheep, or goat clones, or on the progeny of all species of animals cloned for food. The FDA's conclusions are based on a few reports of a very small number of clones or progeny. In some cases, reports are of just one animal. While this limited data indicates that clones and clone pregnancies are likely to be abnormal, resulting in premature death, the FDA ignores these findings. The FDA states instead that pig, sheep, and goat clones who survive the perinatal period and their clone progeny are "normal and healthy,"[14] a conclusion that is not supported by the data.[15]

Summary

The conclusions in the FDA's Risk Assessment are not supported by the scientific evidence showing that severe health problems and abnormalities are the norm with animal cloning, not the exception. Given the animal cruelty associated with this experimental technology, AAVS has requested that the FDA ban the cloning of animals for food. **AV**

RESOURCES

[1] The FDA uses the phrase "conventionally bred animal" to refer to an animal produced through any existing means other than cloning. In particular, the phrase applies to animals produced using assisted reproductive technologies such as artificial insemination, *in vitro* fertilization, and embryo transfer, as well as animals produced through natural breeding.

[2] The summary of AAVS's comments pertains primarily to cow clones for the sake of clarity and because more data were available for these animals.

[3] Paterson, L. (2002). *Somatic Cell Nuclear Transfer (Cloning) Efficiency.* Retrieved October 2006, from http://www.roslin.ac.uk/downloads/webtablesGR.pdf.

[4] Heyman, Y., Chavatte-Palmer, P., LeBourhis, D., Camous, S., Vignon, X., & Renard, J.P. (2002). Frequency and occurrence of late-gestation losses from cattle cloned embryos. *Biology of Reproduction, 66,* 6-13.

[5] Heyman, Y., Chavatte-Palmer, P.,Berthelot,V., Fromentin, G., Hocquette, J.F.,Martignat, L., & Renard, J.P. (2007). Assessing the quality of products derived from cloned cattle: An integrative approach. *Theriogenology, 67*(1), 134-141.

[6] Panarace, et al. (2007). How healthy are clones and their progeny: 5 years of field experience. *Theriogenology.*

[7] Chavatte-Palmer, et al. (2004).

[8] Food and Drug Administration (2006). Animal Cloning: A Draft Risk Assessment, Chapter V.

[9] FDA (2006). Chapter V. See note 7 above.

[10] FDA (2006). Chapter VII. See note 7 above.

[11] Meek, J. (2002, April 19). Tears of a clone. *The Guardian.* Retrieved December 6, 2006, from http://www.guardian.co.uk/genes/article/0,2763,686989,00.html.

[12] Gardner, A. (2007, February 12). Scientists clone mice from hair follicle stem cell. *Washington Post.* Retrieved February 12, 2007, from http://www.washingtonpost.com/wp-dyn/content/article/2007/02/12/AR2007021200987.html

[13] FDA (2006). Chapter V. See note 7 above.

[14] FDA (2006). Chapter VII. See note 7 above. This FDA statement also includes cow progeny.

[15] The FDA does, however, acknowledge that neonatal sheep clones appear to suffer similar abnormalities as neonatal cow clones. In addition, though declaring sheep clones who survive the neonatal period to be normal and healthy, the FDA states that there is insufficient data to determine the food consumption risks related to cloned sheep and has recommended that the ban on food from sheep clones remain in place.

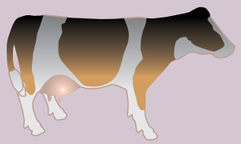
Cloning in a Nutshell

Researchers are attempting to produce animals asexually (that is, without requiring a male and a female to mate) by using a procedure known as somatic cell nuclear transfer (SCNT), more commonly referred to as cloning. SCNT is the procedure that was used to produce Dolly the sheep in 1996, and is also used in stem cell research.

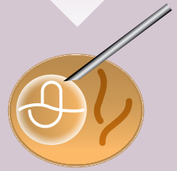
This diagram illustrates the main steps involved in cloning farm animals.

1 Tissue sample is obtained from donor animal to be cloned (usually from a hole punch of the ear).

2 Cells are cultured and genetic material (DNA) from the nucleus is isolated.



3 Eggs (oocytes) are harvested from live animals (via transvaginal aspiration) or from dead animals at a slaughterhouse.



4 Genetic material (DNA) from egg nucleus is removed.

5 Donor cell/nucleus is fused with enucleated oocyte using electrical stimulation. Resulting clone embryo is grown in culture for a few days.

6 Embryo (sometimes multiple embryos) is implanted into surrogate mother who has been primed with hormones.

7 Pregnancy is likely to be lost due to abnormal development. On rare occasions (<5% of attempts), a cloned animal survives and is delivered, usually via C-section.

Note: Because there is mitochondrial DNA that lies outside the nucleus and remains from the original egg, a clone will exhibit some differences from the donor animal. These differences, and the extent to which the egg can or cannot be 'reprogrammed,' are largely responsible for the high degree of inefficiency and unpredictability that characterize cloning. In fact, only 1-4 percent of cloning attempts will result in a live, relatively healthy animal who survives to adulthood.

WHAT DOES THE PUBLIC THINK ABOUT ANIMAL CLONING?

In December 2006, AAVS commissioned the Opinion Research Corporation (ORC) to conduct a survey in order to garner the public's opinion of cloning animals for food. Because the suffering of animals used in cloning is not readily discussed in the media, AAVS was particularly interested in the public's ethical and moral concerns. As evidenced by the survey results, the majority of Americans are disconcerted by the notion of cloning animals for food. And although they are not readily aware of the animal suffering endured during the process, when told, a great majority do not believe the novelty is worth the risk. For this reason, AAVS is dedicated to revealing the truth behind animal cloning.

Q. Do you approve or disapprove of cloning animals for food?

Two thirds of adults (66%) disapprove of the cloning of animals for food. One-quarter (27%) approve it, and 8% don't know.

➜ Women are more likely to disapprove of animal cloning for food than are men (75% vs. 56%).

➜ Adults ages 55 and older (73%) are more likely to disapprove than those 18-54 (62%).

➜ Respondents in non-metropolitan areas of the U.S. are more likely to disapprove (78%) than those in metro areas (62%).

Q. If you knew animal cloning involved animal suffering, would you (still) approve of it?

Two-thirds of adults who approve of cloning animals for food or don't know would not approve of it if they knew the process involved animal suffering, raising the disapproval rate to 88%. Three in ten (29%) would still approve animal cloning for food, and 6% don't know.

➜ Women were more likely than men to say they would disapprove if they knew cloning involved animal suffering (78% vs. 58%).

Q. Should the government ensure ethical issues are publicly discussed before allowing cloned animals to be sold as food?

Nearly nine in ten adults (87%) think the government needs to ensure that the ethical issues related to animal cloning are publicly discussed before allowing cloned animals to be sold as food. Ten percent do not think so, and 3% don't know.

➜ Respondents ages 18-64 are more likely than those 65 and older to say that they do think the government needs to ensure the ethical issues are publicly discussed (89% vs. 77%).

➜ Those in non-metropolitan areas of the U.S. are more likely to say yes (93%) than those in metro areas (85%). AV

Other Survey Results

Other surveys not commissioned by AAVS support the claim that the majority of Americans are leery of animal cloning.

➜ **Do you think it is a good idea or a bad idea to clone animals such as sheep?** (CNN/*Time*, 2001)
Good idea: 29%
Bad idea: 67%
Not sure: 4%

➜ **Should it be legal to clone animals?** (ABC News, 2001)
Legal: 37%
Illegal: 59%
No opinion: 4%

➜ **Do you think it is acceptable to use cloning to reproduce livestock?** (Fox News, 2002)
Acceptable: 23%
Not acceptable: 71%
Unsure: 6%

➜ **Are you comfortable or uncomfortable with animal cloning?** (Pew Initiative on Food and Biotechnology, 2005)
Comfortable: 24%
Uncomfortable: 66%
Don't know: 10%

➜ **What is your most important concern about animal cloning?** (Pew Initiative on Food and Biotechnology, 2005)
Religious or ethical concerns: 36%
Concerns about safety: 23%
Personally uncomfortable with it: 13%
The effect on animal species: 10%
Fear of risks: 6%
Distrust of producers of clones: 5%
Other: 1%
No opinion: 6%

➜ **Do you think food produced from animal clones is basically safe, basically unsafe, or don't you have an opinion on this?** (Pew Initiative on Food and Biotechnology, 2006)
Safe: 21%
Unsafe: 43%
Don't know/No opinion: 36%

➜ **What is your impression of animal cloning in general?** (International Food Information Council, 2006)
Favorable: 16%
Unfavorable: 56%
Neither favorable nor unfavorable: 28% AV

Animal Cloning:
Violating the Integrity of Animals?

The following is an excerpt from "Ethics and Farm Animal Cloning: Risks, values, and conflicts." It discusses the treatment of animals as commodities in cloning and how this mindset might affect an individual animal's existence. The report was written by Dr. Mickey Gjerris from the Danish Centre for Bioethics and Risk Assessment at the University of Copenhagen as part of the project "Cloning in Public." Footnotes and literature references have been omitted here, but can be seen in the full report that is available at www.sl.kvl.dk/cloninginpublic.

…"Integrity"…refers to the wholeness, fullness or "unalteredness" of the animal—or sometimes, more generally, living thing, or more generally still, ecosystem. The precise meaning of the term "integrity" is debated in the literature. It is clear, however, that the notion of integrity is commonly used to capture concerns about the negative impact of technology on animals that are not included even in broader notions of animal welfare…. Thus the use of biotechnology on animals, both in genetic modification and cloning, is seen in parts of the literature as a potential violation of the integrity of the animal. There seem to be two main aspects of the concept here. One that understands integrity as a basically biological concept to be found in e.g. the behaviour or the genome and one that sees integrity as a way of expressing an ideal or truth about animal existence and the meaning of it that is experienced in our everyday life with animals.

Within the biologically oriented thinking, the cloning of animals is seen to violate the integrity of the animals by replacing the usual act of sexual procreation with an act of controlled copying of an existing genome. The term "integrity" here refers to notions of the appropriateness of being brought into being by methods that are the same as those that created other animals for millions years. Not being a result of the random mixture of genes that normally takes place at the conception of a new individual is somehow a violation of wholeness. To put it more simply: it is the violation of the basic conditions of the individual's being brought into the world that is the ethical problem. This closely relates to the idea that cloning is unnatural; it can be discussed along the same lines. Undoubtedly it is true that for millions of years mammals have been brought into the world in accordance with some basic biological principles that, among other things, incorporate an element of chance. But the mere fact that the biological method of reproduction is different for cloned animals does not necessarily imply that this is an ethically unacceptable technology—first and foremost, because it is very hard to see any real link between natural processes and the ethically good. Many things occur in nature that do not appear to be ethically good. Equally, many things that happen in nature conflict with one another (and so here the call to follow nature raises the ethical question of what to do, since one still has to choose between radically different ways of acting).

Another way of understanding the concept of integrity—and one that avoids the hazards of the naturalization of ethics—is to see the term integrity as something expressing a limit to the use that humans can make of animals. It expresses the idea that there are uses of animals that exceed what is ethically acceptable and violate the wholeness or fullness of their being. Integrity in this sense can be seen as something that we become aware of when our commodification of the animal reaches a certain level. One way of explaining this is to claim that there are two different ways in which animals can be known to humans. In one way, we understand them as means to reach our own ends. Animals can then be defined in terms of how they can be used to fulfill our needs. And in this sense they can be fully understood. There are no surprises here. There is, for example, nothing strange about a cow when it is seen from this perspective. It is basically a walking resource that can provide us with milk, meat, and hide. In a certain sense it is defined by its usefulness to us. When we know how the cow can be used, we know what there is to know about it. The developments, from the very first attempts at the domestication of cows to today's attempts to clone animals with traits that we find particularly useful, can be seen as one long process of commodification of the cow or familiarization of the cow. It no longer holds any surprises for us—only technical challenges.

But to view the cow only from this perspective is, precisely, to violate its integrity, since there is something more to it than merely being of use to us. It is something in itself, independent of our needs, an individual we cannot capture through our familiarization with it. In a certain sense it is alienated from us since it is independent of us. There are things about it that we can experience, but cannot exploit or utilize to our own advantage….

From this perspective farm animal cloning clearly can be said to violate the integrity of the animal: the technology completely ignores what the animals is, apart from that which we can utilize; it is turned into a resource that can be copied and used, if desired. In that process, aspects of the animal that cannot be utilized are neglected. One is tempted to say that the balance between use and misuse is crossed, although the understanding of the animal as something inherently independent of humans can also be interpreted as a prohibition against utilizing the animal at all.

It is important to note that, within this perspective, cloning is seen as ethically problematic not because of some inherent quality of the technology itself, but because it is a continuation of a more general familiarization process that is, in itself, ethically problematic. It is, as it were, the straw that breaks the camel's back. Criticism of this kind is sometimes dismissed because it fails to show anything distinctively problematic with the technology in question…. It just points, it is said, to familiar ethical problems in the relationship between humans and animals, and these problems that can be seen to be resolved in the fact that we already accept the utilization of animals, with technologies, in many other areas. But perhaps cloning should rather be regarded as an eye-opener that will prompt a re-evaluation of existing ways of utilizing animals, e.g. within selective breeding schemes using more traditional methods. There is no rule in ethics saying that when something has been going on for a long time, it automatically becomes ethically acceptable.

Whether one accepts any of the notions of animal integrity proposed here, and whether they constitute a reason to totally abandon farm animal cloning or should be integrated into the balancing of pros and cons is…in the end an ethical choice that will be made on the basis largely of one's existing ethical beliefs. What is crucial to note in this connection is that claims about animal integrity are bound to play a significant role in the coming discussions concerning farm animal cloning, and that these claims should not be disregarded too quickly because of a misconception of them as necessarily bound to some sort of biologically founded understanding of the concept. The idea that there is such a thing as animal integrity, and that it places limits on the use that humans can make of animals, can be argued from many different philosophical and religious perspectives. Simply rejecting the claims and pointing to a lack of biological/scientific foundation of the claims ignores questions about what should be included in the discussion as legitimate ethical views. Refusal to accept the notion of animal integrity is also a choice; it is based on certain kinds of ethical value, and on a certain understanding of the relationship between natural science and other ways of experiencing and knowing the world. This is not to say that all points of view should be regarded as equal, but simply to insist that no point of view can be excluded from the discussion simply because of its alleged lack of scientific back-up. It is not necessarily easy to evaluate the weaknesses and strengths of these other perspectives on the world. Yet to claim that the only valid perspective on reality is the natural-scientific one, simply because other perspectives fall short of the way that truth is established within this framework, seems more than arrogant. The alternative is not to accept everything, but to discuss the intersubjective validity of the different perspectives on a societal basis. **AV**

Cloning in a Vacuum:
Regulations pending worldwide

Nina Mak, MS, AAVS Research Analyst

No specific regulations govern the cloning of animals for food anywhere around the world. Many countries are considering official positions on the issue and have voluntary bans in place to prevent the sale of milk and meat from animal clones, but adequate protection of animal and human health from the risks of cloning is sorely lacking.

European Union

Unlike for genetically modified foods, there is no legislation in the European Union (EU) that directly addresses cloned animals.[1] The EU had no plans to formally discuss the issue until news broke in January 2007 that a calf of an American cloned cow was born on a UK farm the previous December.[2] The news touched off a storm of protest and concern that there are no regulations governing the sale of cloned foods in the EU or the import of cloned animals and embryos, particularly in light of the FDA's proposal to approve animal cloning for food in the U.S.

Consequently, the 27 member states of the EU decided to classify food products from cloned animals as "novel foods" and subject them to the same stringent regulations as GMOs (genetically modified foods).[3] More significantly, in March of 2007, the European Commission asked the European Food Safety Authority to look into the future impacts of animal cloning, specifically "to advise on food safety, animal health, animal welfare and environmental implications of cloned animals…their offspring, and of products obtained from these animals."[4] The Commission also asked the European Group of Ethics to look into the ethics of cloning. These reports are due in September.

Canada

Since 2003, Health Canada has instituted an interim policy classifying food products from cloned animals as "novel foods," and has banned the sale of cloned foods in Canada.[5] In response to the FDA's proposed approval of cloned animal products, Health Canada has stated that it will review the issue thoroughly but indicated that it does not intend to approve animal cloning any time in the near future.[6]

Japan

There is currently a voluntary ban in Japan on the selling of food products from somatic cell cloned animals. In 2003, a study group of Japan's Ministry of Health, Labor and Welfare declared that cloned beef is safe to eat and recommended that measures be taken to assess the safety of cloned foods in the future if they are sold, prompting discussion that the ban would be lifted.[7]

In 2004, however, the Ministry of Agriculture, Forestry and Fisheries (MAFF) postponed a decision allowing the sale of cloned beef for human consumption because there were insufficient data on the progeny of clones. MAFF announced plans to collect the data and make a proposal to the Food Safety Commission in 2007 or later, leaving the voluntary ban in place for now.[8]

Australia and New Zealand

There are no regulatory controls on the production and use of cloned animals in Australia and New Zealand, but there is currently a voluntary moratorium on the sale of cloned animals for food.[9]

In January 2007, it was reported that the New Zealand Food Safety Authority told the government that cloned foods appear to be as safe as food from conventionally bred animals and, therefore, do not require any specific regulation. The Authority did not study the animal welfare issues related to cloning, however.[10]

In response, the Green Party called on the New Zealand government to treat food products from cloned animals as novel (like the EU) and require a full risk assessment before allowing cloned milk and meat to be sold as food. The Green Party also called for full public consultation on the issue.[11]

A ruling is now pending from Food Standards Australia New Zealand (FSANZ) on whether food products from cloned animals can be sold to the public, prompted by the FDA's proposed approval of animal cloning.[12]

Many countries are taking a more cautious approach to the regulation of cloned animal food products than the U.S. These countries are looking for more extensive evidence of safety before giving approval and, importantly, are also considering the animal welfare and ethical concerns associated with cloning before making a decision.

Summary

While most countries are not rushing to approve animal cloning, trade implications will require them to take some stance on the issue if the FDA goes ahead with its plan to approve cloned foods. Many countries are taking a more cautious approach to the regulation of cloned animal food products than the U.S. These countries are looking for more extensive evidence of safety before giving approval and, importantly, are also considering the animal welfare and ethical concerns associated with cloning before making a decision. Ultimately, the FDA's final decision will have a great impact on the future of animal cloning for food worldwide. **AV**

RESOURCES

[1] With the exception of a law passed in Denmark in June 2005 that limits animal cloning to research and biomedical purposes. Gamborg, C., Gjerris, M., Gunning, J., et al. (2006). Regulating Farm Animal Cloning: Recommendations from the project "Cloning in Public." Danish Centre for Bioethics and Risk Assessment.

[2] Martin, N. (2007, January 12). Trust in British food 'threatened by birth of calf.' *The Daily Telegraph*. Retrieved January 17, 2007, from http://www.telegraph.co.uk/news/main.jhtml?xml=/news/2007/01/11/nembryo11.xml.

[3] Mercer, C. (2007, January 17). EU states agree on clone food plan. *DairyReporter.com*. Retrieved January 18, 2007, from http://www.dairyreporter.com/news/ng.asp?n=73418&m=2DRE119&c=jcnfkplnnhjccxn.

[4] *BBC News*. (2007, March 8). EU to look at cloned meat safety. Retrieved March 8, 2007, from http://news.bbc.co.uk/2/hi/science/nature/6431229.stm.

[5] Health Canada. (2003). Food Directorate Interim Policy on Foods from Cloned Animals. Retrieved April 4, 2007, from http://www.hc-sc.gc.ca/fn-an/legislation/pol/pol-cloned_animal-clones_animaux_e.html.

[6] *CBC News*. (2006, December 31). Canada to examine data on cloned food. Retrieved April 4, 2007, from http://www.cbc.ca/consumer/story/2006/12/29/cloning-canada.html.

[7] *MeatProcess.com*. (2003, May 6). Cloned cattle, meat safe, say Japanese. Retrieved April 4, 2007, from http://www.meatprocess.com/news/ng.asp?id=14925-cloned-cattle-meat.

[8] Citizens' Biotechnology Information Center. (2005, January). Lifting of ban on sale of somatic cell cloned beef postponed. Retrieved April 4, 2007 from http://www5d.biglobe.ne.jp/~cbic/english/2005/journal0501.html.

[9] Adamson, K. (2007, February 11). Test tube chop fear. *Herald Sun*. Retrieved February 15, 2007, from http://www.news.com.au/heraldsun/story/0,,21204280-662,00.html.

[10] *The New Zealand Herald*. (2007, January 30). Meat and milk from animal clones pass safety test. Retrieved January 30, 2007, from http://www.nzherald.co.nz/section/2/story.cfm?c_id=2&objectid=10421422.

[11] Green Party. (2007, January 30). Press Release: Ask consumers if they want clones on their menu. Retrieved January 30, 2007, from http://www.scoop.co.nz/stories/PA0701/S00195.htm

[12] Adamson, L. (2007, February 11). See note 7 above.

How the Sheep Got Her Cells

By Nicole Perry,
AAVS Outreach Coordinator

From the moment she was conceived, Dolly was marked an extraordinary sheep. Although she looked like any other Finn Dorset, with her nappy, white hair, short tail, and long snout, her DNA told a different story—it was nearly identical to her mother's.

Dolly was the first mammal successfully cloned from an adult cell. Although she was not the first ever clone, her birth was the rare result of a process called somatic nuclear cell transfer (SNCT). Statistically, Dolly had only a 0.36 percent chance of surviving past birth.

Unlike previous cloning methods, SNCT utilizes an adult cell instead of an embryonic cell, allowing researchers to clone a more mature animal who has developed past nascence. The technology's implications for animal industries are grand. In theory, this process would allow humans to breed the most perfect animal and clone him or her ad infinitum.

SNCT begins with an empty egg that has been cleared of its genetic material. Then, researchers fill the void with DNA from the donor animal, collected via a sample cell. The egg is later implanted into a surrogate mother with the hope that she can carry the pregnancy to term.

In reality, however, the process has proved very inefficient. To clone Dolly, 277 cloned embryos were implanted into surrogate mothers, only 13 pregnancies resulted, and only one animal was born successfully—Dolly. She was born on July 5, 1996 at Scotland's Roslin Institute.

Those who helped deliver the lamb were tickled by the fact that she was cloned from a mammary gland. Thus, they christened her after a notably busty country-western singer, Dolly Parton, and the name stuck.

Despite enthusiasm at the Institute, Dolly's birth was not made public for another six months. Because of the high failure rate of previous cloning attempts, the researchers needed to be convinced of her health and vitality. On February 21, 1997, they revealed her to the public.

This year marks the 10th anniversary of Dolly's introduction to the world. Her birth—and her death—have inspired researchers to delve further into the cloning process, at the same time raising significant questions about bioethics. Unbeknown to her, Dolly sparked conversations about human cloning, pet cloning, pharming, and cloning animals for food. In all cases, the suffering of animals used for cloning is generally pushed under the rug.

Dolly is a case in point. The average sheep lives approximately 12 years, but Dolly's life was cut in half. As a young animal, she started to exhibit characteristics common in older sheep, such as a rare form of arthritis in her hind legs. Tests in 1999 revealed that her cells appeared more worn down than a typical sheep her age. Later, when veterinarians confirmed she was experiencing progressive lung disease, the decision was made to euthanize Dolly. She was only six years old.

Although researchers at the Roslin Institute deny her death was due to cloning, questions remain about how the process affects DNA. A report released by the National Academy of Sciences noted that there is little known about aging in cloned animals, partly because there are so few adult clones. What has been confirmed, however, is that certain risks are associated with animal cloning, such as physical deformities and premature deaths. The Roslin researchers themselves have substantiated this claim: "Animal cloning so far results in high rates of abortions and neonatal losses…. Many cloned animals display birth defects, including respiratory failure, immune deficiency, and inadequate renal function—all leading to premature deaths."[1]

Today, cloning is "only slightly better than it was originally," according to Professor Ian Wilmut, one of the researchers who cloned Dolly. In 1997, it took 277 attempts to clone one sheep; today it takes between 150 and 200 attempts. "To be honest, I think we should still be surprised that cloning works at all," Professor Wilmut said. "Before Dolly, people thought it was impossible."[2]

Indeed, 10 years later, the world has seen a potpourri of cloned animals, including cats, deer, goats, and dogs. (see sidebar) In fact, the cloning debate has become so controversial that some states have passed bills prohibiting the cloning of humans. Unfortunately, no matter how many different species of cloned animals are produced, the animals involved still suffer greatly.

Just ask Dolly. Her stuffed remains are on display at the National Museum in Scotland. AV

RESOURCES

[1] Schatten, G., Prather, R., & Wilmut, I. (2003). Cloning Claim Is Science Fiction, Not Science. *Science.* 299:344.

[2] Morelle, Rebecca. (February 23, 2007). A decade on from Dolly. *BBC News.* Retrieved March 15, 2007, from http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/6359011.stm.

Animals Who Have Been Cloned

BANTENG
After two endangered Asian cows were cloned, one was euthanized due to malformations.

CARP
The first interspecies clone was created from an Asian carp and European crucian carp.

CAT
Copy Cat, also called "CC," was the first cloned cat. Following her birth, an American company, Genetic Savings & Clone, launched a pet cloning business that AAVS was instrumental in shutting down.

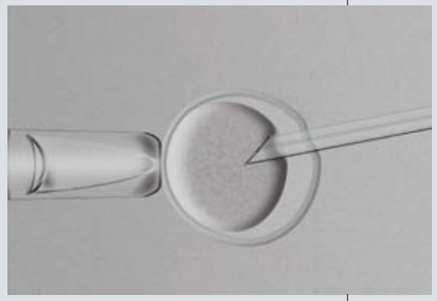
COW
Cows have been cloned with the aim of using their flesh and milk for human consumption.

DEER
After the birth of Dewey, some scientists speculated that cloning deer could replenish populations that are depleted due to hunting.

DOG
Scientists in Korea cloned the first dog, an Afghan hound named Snuppy. He was the only surviving clone from 1,095 embryos.

FROG
Although no frogs developed past the tadpole stage, the frog was the first animal cloned in 1952.

FRUIT FLY
After 800 attempts, five fruit flies were cloned from embryo cells. These insects are commonly used to study genetics.



GAUR
Noah, an endangered wild ox, died within 48 hours of birth.

GOAT
The first goat cloned from an adult cell, Yuanyuan, died 36 hours after being born.

HORSE
After nearly 400 attempts, scientists cloned one horse who was born one and a half months past his due date.

MONKEY
Tetra was the first rhesus monkey cloned.

MOUSE
Mice are commonly cloned and used in research.

MULE
Idaho Gem was the first member of the horse family to be cloned.

PIG
Pigs have been cloned with the hope of using their organs for xenotransplantation.

RABBIT
Rabbits have been cloned for intended use in medical experiments.

RAT
Researchers have cloned both male and female rats, and have experienced high failure rates.

SHEEP
Dolly, the first mammal to be cloned from an adult cell, was euthanized at an early age. AV

By Crystal Schaeffer, M.A. Ed.,
AAVS Outreach Director

Invariably Bad:

Animal Cloning in Biomedical Research

Over the past decade, there has been a great deal of debate regarding animal cloning, with much of it focusing on the technology itself. The controversy surrounding animal cloning is warranted due to its severe animal welfare implications. Nonetheless, researchers continue to tout the technology for use in biomedical research, and few have voiced concern over how the deficits of animal cloning will affect the reliability of data resulting from studies utilizing it.

The vast majority of animal cloning research, especially those studies that utilize mice, is aimed at refining the inefficiency of the technology. However, scientists also clone animals to create homogenous groups of research 'subjects' for use in experimentation in an attempt to reduce variability. At the Whitehead Institute in Massachusetts, for example, researchers are cloning mice to study cancer and its manifestation.[1,2] Scientists are investigating the role of specific enzymes and their impact on gene expression in the development of cancer and further hope to distinguish whether cancer arises due to genetic or epigenetic changes.[3]

The fact is, however, that animal cloning has not generated the financial or scientific rewards hoped for by the biomedical industry. It has been widely reported within the scientific literature that animal cloning has a success rate of less than four percent. This statistic alone leaves one to question the judgment of researchers who choose to incorporate the technology, which is unreliable and expensive both in terms of dollars and animal life, in their investigative studies. For example, in its Draft Risk Assessment regarding the use of animal cloning for food, the U.S. Food and Drug Administration (FDA) stated that the vast majority of cloned fetuses develop abnormally and die in the womb, and also mentioned several specific studies demonstrating the inefficiency of animal cloning, including one that found that 24-26 percent of cloned animals who survive birth die within six months.[4] The Assessment also reported that the majority of clone pregnancies require Caesarean section or another form of intervention for delivery, compared to fewer than one percent of conventional pregnancies,[5] forcing animals to undergo invasive procedures at an added financial burden to the research study.

Cloned animals who do survive the first few months of life often suffer from a variety of health problems. For instance, respected cloning experts Ian Wilmut of the Roslin Institute where Dolly, the first cloned mammal, was 'created,' and Gerald Schatten of the Magee Women's Hospital and the University of Pittsburgh School of Medicine stated in the journal *Science* that "Many cloned animals display birth defects, including respiratory failure, immune deficiency, and inadequate renal function—all leading to premature deaths…."[6] Another study in *Science* concurred: "Even apparently healthy survivors may suffer from immune dysfunction or kidney or brain malformation, perhaps contributing to their death at later stages."[7]

The fact that cloned animals suffer many health consequences as a product of cloning technology can create unwanted variables that could impact the results of research. For example, it has been reported that animal clones who survive into adulthood have a higher risk of suffering from obesity,[8] a condition that often relates directly to metabolism. Researchers at the University of Cincinnati are exploring the possible mechanisms involved in this phenomena and have found that "the obese phenotype is maintained over successive generations of cloned mice."[9] Because obesity can be tied to metabolic function or, specifically, how quickly a substance (whether food or drug) is absorbed by the body, it stands to reason that data derived from using cloned animals, who have a higher propensity to be obese, could be skewed.

Aging is another physiological activity that is impacted by the cloning process and in turn could affect research data collected using cloned animals. Scientists tracking cloned animals from birth to death have found that mice cloned from somatic cells have "a significantly shorter life span" than those conceived naturally.[10] Furthermore, it was reported that cloned mice had lower antibody production, "suggesting that decreased immunologic function—a function that generally declines with advancing age—compromised the clones' ability to fend off infection."[11] Utilizing cloned animals with weakened immune systems in research could also impact investigation results because their bodies would not be able to fight disease and/or infection normally.

Additionally, in another study discussed in the *Journal of Reproduction and Development*, researchers reported finding several phenotypic abnormalities[12] in cloned mice that are not found in those produced through natural mating, including enlarged placentas, increased body weight, lack of eyelid fusion, and umbilical hernia.[13] The researchers found that "almost all clones have shown various phenotypic abnormalities that are not present in animals produced by natural mating," and further stated that "[t]hese abnormalities represent a barrier to the medical use of clones."[14]

Also of question is whether cloning really reduces variability in scientific experiments. Beyond the health abnormalities that appear in cloned animals and confound studies, researchers at Texas A&M have found that clones are no more homogenous or identical for many traits than naturally produced animals.[15] Therefore, animal clones are of limited use for reducing the size of groups and variability involved in animal experimentation. Given these findings, it is difficult to see how one could justify animal cloning for research purposes.

Scientists tracking cloned animals from birth to death have found that mice cloned from somatic cells have "a significantly shorter life span" than those conceived naturally. Furthermore, it was reported that cloned mice had lower antibody production.

Another major application of cloning technology is for the reproduction of transgenic animals who have been engineered with genes from other species to study disease; produce pharmaceuticals in the milk, blood, urine, or semen (pharming); or produce tissues and organs for transplantation into humans (xenotransplantation). For example, researchers at the University of Massachusetts Amherst are working to develop a method to produce human polyclonal antibodies (PAbs) in cloned calves, a process called pharming, to serve as a biodefense mechanism against a bioweapon attack.[16]

Another study reported in *Cloning and Stem Cells* is investigating the possibility of pharming therapeutic human PAbs in bovines for use in patients suffering from autoimmune diseases or for the treatment and prevention of antibiotic resistant infections.[17] This type of research is especially concerning due to the fact that it runs the risk of exposing immune compromised patients to possible animal retroviruses,[18] viruses that are impotent in one species yet deadly in another.[19]

This same threat is extremely high in xenotransplantation, a process in which cells, tissue, or an organ is transplanted from one species into a different species. Despite this, cloning expert Jerry Yang is working to create "immune protected universal donor cloned transgenic pigs for xenotransplantation."[20] Yang justifies his research, citing a national shortage of organs for transplant, and he received over $160,000 taxpayer dollars last year to fund this project, money that could otherwise be spent supporting programs such as the United Network of Organ Sharing, which promotes human to human organ donation, a process that is much safer and less expensive than xenotransplantation.

The problems in assessing the health of cloned transgenic animals is highlighted by the FDA in its Draft Risk Assessment, which states, "Because these animals are transgenic clones, it is not possible to determine whether adverse outcomes result from the direct effect of the expression of the transgenic construct" [DNA sequence],…"the insertion of the construct," the cloning process, or "some interaction of any or all of these processes."[21] Not being able to distinguish these differences is problematic since it

would be difficult to determine what is responsible for the observations gathered during a study involving transgenic clones. These difficulties are worsened if scientists then attempt to apply the results to a different species such as humans.

As outlined here, there are many questionable issues surrounding animal cloning; not just concerning animal welfare but also for its implications in affecting data resulting from studies using animal clones. The biomedical community's desire to use animal cloning is unsubstantiated, and "[a]t the moment, the long-term consequences of mammalian cloning remain poorly characterized. Data available thus far suggest that we should use this technology with great caution…."[22] Indeed, the well-being of animals and the quality of science may well depend upon it. AV

RESOURCES

[1] Jaenisch Lab Research Summary. Retrieved April 9, 2007, from http://www.wi.mit.edu/research/summaries/jaenisch.html.

[2] Jaenisch, Rudolf. (2006). Abstract. Epigenetics, Stem Cells, and Cancer. Retrieved on April 12, 2007, from http://crisp.cit.nih.gov/crisp/CRISP_LIB.getdoc?textkey=7100613&p_grant_num=2R01CA087869-06&p_query=&ticket=34483257&p_audit_session_id=209495388&p_keywords=

[3] Epigenetic changes occur due to environmental factors that affect gene expression. The gene itself does not change.

[4] Food and Drug Administration (2006). Animal Cloning: A Draft Risk Assessment.

[5] Ibid.

[6] Schatten, G., Prather, R., & Wilmut, I. (2003). Cloning Claim is Science Fiction, Not Science. *Science. 299*:344.

[7] Rideout, W.M., Eggan, K., & Jaenisch, R. (2001). Nuclear Cloning and Epigenetic Reprogramming of the Genome. *Science. 293*:1093-1098.

[8] Sakai, Randall R. (2006). Abstract. Food intake and obesity in cloned mice. Retrieved April 5, 2007, from http://crisp.cit.nih.gov/crisp/CRISP_LIB.getdoc?textkey=7037784&p_grant_num=1R01DK068273-01A2&p_query=(cloned)&ticket=33976720&p_audit_session_id=208028808&p_audit_score=81&p_audit_numfound=3&p_keywords=cloned.

[9] Ibid.

[10] Stephenson, Joan. (March 13, 2002). Shorter Life Span for Cloned Mice. *Journal of the American Medical Association*. Vol. 287, No. 13.

[11] Ibid.

[12] The outward appearance of how a gene is expressed.

[13] Nobuhir, Shimozawa, Shingo, Tajima, Noriyuki, Azuma, Kyoij, Hioki, Tomohiro, Kono, & Mamoru, Ito. ((2003). Histological Study of the Hypertrophic Placentas and Open Eyelids Observed in Cloned Fetuses. *Journal of Reproduction and Development*. Vol. 49, No. 3.

[14] Ibid.

[15] Archer, Greg S., Dindot, Scott, Friend, Ted H., Walker, Shawn, Zaunbrecher, Gretchen, Lawhorn, Bruce, Piedrahita, Jorge A. (2003). Hierarchical Phenotypic Epigenetic Variation in Cloned Swine. *Biology of Reproduction 69*, 430-436.

[16] Osborne, Barbara A. (2006). Abstract. Polyclonal human antibody in cloned HAC-transgenic cows. Retrieved April 5, 2007, from ttp://crisp.cit.nih.gov/crisp/CRISP_LIB.getdoc?textkey=6984133&p_grant_num=5R01AI057652-03&p_query=(cloned+%26+transgenic)&ticket=33976896&p_audit_session_id=208028808&p_audit_score=16&p_audit_numfound=4&p_keywords=cloned+transgenic

[17] Roble, James M. (2007). Application of Cloning Technology for Production of Human Polyclonal Antibodies in Cattle. *Cloning and Stem Cells.* Vol. 9. No. 1.

[18] World Health Organization. Emerging Zoonoses. (n.d.). Retrieved August 25, 2006, from http://www.who.int/zoonoses/emerging_zoonoses/en/.

[19] The common example of a retrovirus is HIV.

[20] Yang, Xiangzhong. (2006). Abstract. Cloned Pigs for Xenotransplantation. Retrieved on April 5, 2007, from http://crisp.cit.nih.gov/crisp/CRISP_LIB.getdoc?textkey=7110095&p_grant_num=1R41AI069865-01&p_query=(cloned+%26+transgenic)&ticket=33976658&p_audit_session_id=208028808&p_audit_score=22&p_audit_numfound=2&p_keywords=cloned+transgenic

[21] Food and Drug Administration (2006). Animal Cloning: A Draft Risk Assessment.

[22] Tamashiro, K.L., Sakai, RR., Yamazaki, Y., Wakayama, T., & Yanagimachi, R., Developmental, behavioral, and physiological phenotype of cloned mice. *Adv. Exp. Med. Biol. 2007*;591:72-83.

Cloning Endangered Species and Undermining Conservation

For the past decade, some scientists have lauded the use of cloning technology in an effort to save endangered species or even 'resurrect' extinct ones. Indeed, several endangered species, including the mouflon, a European wild sheep; the banteng, a rare species of Asian cattle; and the African wildcat, have all been cloned during the past few years. The first endangered clone, Noah, a guar (an ox species native to southeast Asia and India), died within 48 hours of his birth. An attempt to clone a wild sheep, the argali, failed to produce live offspring.

Some zoos see cloning as a way to propagate members of endangered species, and they maintain 'frozen zoos,' biological samples of deceased animals whom they may seek to clone in the future. However, as with most captive bred animals, it is extremely unlikely that cloned animals will ever be released into the wild, since they rely on learning survival skills from their parents and other members of their species—traits that could not be demonstrated by domestic surrogate mothers or other captive animals. It is also important to note that it is extremely unlikely that a viable breeding population would be created from a few cloned animals, because of the tremendous loss of genetic diversity that is needed to sustain populations in the wild.

Regardless of the millions of dollars spent on cloning endangered species, the very reasons that these animals are suffering precariously depleted numbers is an issue that still needs to be addressed. Prime among them is the fact that the habitats of endangered animals are being destroyed at alarming rates. Because of this, protecting wild populations and their habitats is one of the most important ways to effectively save endangered species.

Nonetheless, in disregard of the improbability and waste of funding that would otherwise fuel conservation efforts, some scientists are looking to clone species who are long extinct, like the woolly mammoth and Tasmanian tiger. Despite the controversy over the goals of cloning members of endangered species and the inherent animal suffering, researchers are moving forward with experiments to clone species such as the giant panda, ocelot, and cheetah. AV

Clones in Organics?

When the Food and Drug Administration (FDA) released its Draft Risk Assessment, which stated that the human consumption of meat and milk from cloned animals and their progeny is safe, many people were alarmed, including those in the organic food community, who feared that cloned food could be labeled as organic.

In 2002, the U.S. Department of Agriculture (USDA) established its National Organic Program (NOP) and released standards for companies seeking organic certification. Under these rules, companies seeking to have their products labeled organic must meet certain criteria, including not using growth and/or product enhancement strategies such as hormones, chemical pesticides, and/or genetic engineering; maintaining preventative health care practices for animals; and providing care and treatment to animals that encourages their natural behavior.[1]

Cloning clearly does not meet these principles. A great deal of animal suffering surrounds this technology as animals are forced to endure repeated invasive procedures to implant cloned embryos, and Caesarean sections are performed because natural births can be difficult. Artificial hormones are also often used to help establish pregnancies and to induce labor. Furthermore, severe birth defects that cause the animals discomfort and pain are common.

Additionally, organic production forbids the use of cell fusion, a technique often used in cloning.[2] Specifically, the National Organic Rule states that cell fusion and similar methods used to "influence [an organism's] growth and development by means that are not possible under natural conditions are not considered compatible with organic production,"[3] thus making the use of cloning a clear violation of USDA's organic labeling standards.

In response to people's concerns regarding animal cloning and organic food, the NOP posted a document on its website clearly outlining its position. NOP stated, "Cloning as a production method is incompatible with the Organic Foods Product Act (OFPA) and is prohibited under NOP regulations." It further stated that animal cloning technology is "incompatible" with OFPA and food produced this way cannot be considered organic.[4]

To further clarify organic regulations in relation to cloned animals for food, the National Organic Standards Board (NOSB) released its "Cloning Recommendation" in February. In its report, NOSB states that it "believes that the existing federal organic rules prohibit animal cloning technology and all its products."[5] However, to be explicit, NOSB recommended that somatic cell nuclear transfer, the most common method to produce cloned animals, be included in NOP's list of excluded production methods.

In March, the NOSB released its recommendations addressing whether the progeny of cloned animals could be labeled as organic. NOSB concluded that the National Organic Program rules prohibit the use of animal cloning technology and all products from cloned animals as well as their progeny. The NOSB advises amending the rules to specifically clarify the exclusion of cloned animals and their progeny.

Interestingly, the NOSB recommendation referenced a December 2006 Pew Initiative of Food and Biotechnology survey which found that 64 percent of consumers were uncomfortable with animal cloning, 46 percent of whom were very uncomfortable. NOSB acknowledged that Americans are weary of using cloned animals for food and do not want such products in our food supply.

If the FDA does not require the labeling of food from cloned animals, it is likely that consumers will turn to organic products in light of NOSB's recommendation to the NOP so that they can be confident that the food they are eating and feeding to their families is safe and without ethical concerns. AV

RESOURCES

1 National Organic Program Final Rule. (October 2002). USDA.

2 7 CFR 205.2 Terms defined. (October 2000). National Organic Program Final Rule. USDA.

3 7 CFR 205.2 Terms defined. (October 2000). USDA National Organic Program Final Rule.

4 National Organic Program. (January 31, 2007). Cloning and Organic Livestock Production. Retrieved April 24, 2007, from http://www.ams.usda.gov/NOP/TodaysNews.html.

5 National Organic Standards Board. (February 20, 2007). Livestock Committee. Cloning Recommendation.

MEDIAWATCH

HARD TO SWALLOW

The recent editorial, "Frankenfood? Not quite," states, incorrectly, that the process of cloning animals for food "is almost identical to time-tested methods of animal husbandry." With a 96 percent rate of premature death and health abnormalities, as documented in the FDA's own Risk Assessment, cloning is hardly 'business as usual' on the farm.

A closer look at the numbers reveals how startlingly different cloning is: clone pregnancies, for example, are aborted in 40-90 percent of cases, whereas, according to the FDA report, "producers and veterinarians become concerned when the rate of abortion exceeds 3-5 percent in a herd." Further, an average of one half of the calf clones who survive birth are diagnosed with Large Offspring Syndrome (LOS), in which the animals are grossly oversized and often suffer and die with deformed heads or limbs, as well as heart, lung, liver, kidney, or immune problems. In contrast, LOS occurs in less than 1 percent of artificially inseminated cows.

Cloning is clearly an experimental technology that raises troubling new concerns about animal welfare and ethics. *The Washington Post's* editorial position that there is nothing to talk about entirely disregards these weighty issues, which were raised even by the FDA's own Veterinary Medicine Advisory Committee. The public's apprehensions are more than justified, and a full discussion of these concerns is long overdue. **AV**

Nina Mak, AAVS Research Analyst
The Washington Post
Submitted February 13, 2007

Many Teachers & Students Opt to Dissect with a Computer Mouse

As the Director of Animalearn, an educational program featuring The Science Bank, the largest free loan library of dissection alternatives in the country, I am pleased to say that our experiences regarding dissection are far different than described in Ms. Strauss' article "When Cutting Up in Class Is Okay" (March 5). Ms. Strauss wrote "both advocates and critics of dissections agree that dissections are more popular than ever." Our experiences and data contradict this. Since 2004, annual inquiries regarding the use of alternatives to dissection from The Science Bank have nearly doubled and are now into the thousands. In our focus groups with teachers and professors, we are witnessing a growing trend towards acceptance of virtual dissection alternatives in place of cutting up dead animals.

There are an increasing number of students and teachers who oppose harming animals in education now that so many sophisticated alternatives are available free of charge though programs such as The Science Bank. The trend against killing animals specifically for the purpose of dissection will likely increase over time as more teachers become comfortable with virtual dissection technology, more states adopt student choice laws, and more schools learn that the majority of comparative studies in peer reviewed journals show that students using dissection alternatives learn as much or more than if they dissected an animal. Antiquated dissection methods will eventually become a distant memory and practice. AV

Laura Ducceschi
The Washington Post
Submitted March 7, 2007

Animalearn Champions Cool, Compassionate Classroom

I have to disagree with your headline from January 12, 2007, which reads "Dissection cool teaching tool in Cape classroom." As a humane educator, I am contacted daily by compassionate students and educators who think that dissection is cruel and unnecessary. What many educators and students aren't aware of is that there are hundreds of viable dissection alternatives, such as CD-ROMs and realistic models, which are available and can be used to teach and learn humanely.

While many educators feel that dissection is more useful for hands-on learning, what they may be unaware of is that many medical schools in the U.S., including Yale University and Dartmouth Medical School, do not use live animals in the training of medical students. Most medical schools that do use animals allow students the option of foregoing the animal labs.

I encourage Cape Coral Charter School's science teacher Lynne Cloum and her students to check out dissection alternatives to help them obtain a more progressive humane education. Innovative alternatives can be provided for free through nationwide loan programs like Animalearn's The Science Bank. For more information about cool and compassionate science tools, please visit www.Animalearn.org. **AV**

Nicole Green, AAVS Assistant Director of Education
The News-Press
Submitted January 16, 2007

FL Editorial Dishes Animal Cloning, Cites AAVS Survey

In the January 7 edition of the *St. Petersburg Times*, an editorial was published that discussed cloning animals for food and how this practice relates to consumer needs. The author pointed out that few farmers have cloned their livestock due largely [in part] to the enormous expense involved with the technology, and notes that the dairy industry is decidedly "lukewarm" to the FDA's Draft Risk Assessment, which surmises that meat and milk from cloned animals is safe for human consumption.

Suggesting that the dairy industry might be responding to the needs of consumers, the author mentions several polls conducted on the subject, including one commissioned by AAVS, which found that two-thirds of Americans disapprove of animal cloning. Upon learning that the process involves animal suffering, the disapproval rate increased to 88 percent.

Consumers were encouraged to speak out and share their concerns with allowing the sale of meat and milk from cloned animals by contacting the FDA. **AV**

Editorial
St. Petersburg Times
January 7, 2007

AAVS PRIME RESOURCE FOR INFORMATION ON ANIMAL RESEARCH

An article featured in the *American Chronicle* discussed the use of animals in research, focusing primarily on chimpanzees, especially those exploited by NASA and its space exploration program. Glimpses of the lives of these retired chimps were also shared, as were the physical and psychological difficulties they still endure on a daily basis due to the abuses suffered during their captivity.

The plight of other animals used in research, such as rodents, was also highlighted, and the author wondered why the suffering these animals endure is not viewed with as much concern and emotion as that of chimpanzees. As the guardian of several rats, she shared the personal lives of Wendy, Moira, Angela, and Darling, giving the reader an insider view of how the personalities of rats can be similar to those of humans.

In closing, the author lists several organizations, including AAVS, that can be contacted to learn more about animal experimentation.

Suki Falconberg
American Chronicle
January 4, 2007

Animal Welfare at Risk in Cloning

In response to the recent articles about animal cloning, and Arthur Caplan's op-ed ("Cloning: Hype begat Hype," March 1, 2007), I would like to point out the elephant in the room: what about animal welfare?

Yes, animal cloning is extremely inefficient and unpredictable. And yes, this means that cloning is not economically practical for most farmers. But what tends to be overlooked is what this experiment means for the animals.

Surrogate mothers are pumped with hormones and subjected to repeated invasive procedures so that they can carry the clone embryo, but very few of these pregnancies result in a live birth. According to the FDA's report, most of the surviving clones are plagued by health abnormalities, including oversized bodies, immune deficiencies, lung problems, and organ dysfunction. Oftentimes, the surrogate mother dies during the process. All told, between 96-99 percent of cloning attempts fail, requiring hundreds of animals to produce just one 'healthy' clone.

Whether it comes from the clones themselves, or their progeny, cloned milk and meat represent an inherently cruel technology that provides little, if any, benefit to the public. Instead, cloning raises serious questions about animal welfare and ethics, which have yet to be discussed.

The dangers of cloning are not hype, as Caplan suggests. In fact, they are very real to the animals involved, and very consequential to the public at large. **AV**

Nina Mak, AAVS Research Analyst
Philadelphia Inquirer
Submitted March 2, 2007

Cloned Animals: It's About More Than Food Safety

While reading Rick Weiss' Oct. 17 article "FDA Is Set To Approve Milk, Meat From Clones," I was struck by how much the serious animal welfare and ethical concerns raised by animal cloning often get lost amidst the discussion of food safety.

For instance, do people know that, according to data from the Roslin Institute (where Dolly was famously cloned), over 99 percent of cloning attempts typically fail, resulting in aborted fetuses and newborns with such severe health problems or deformities that they usually die within a few days? Or that hundreds of female animals are subjected to invasive procedures to harvest their eggs or implant embryos so that just one cloned animal can be produced? Or that cloning is primarily being pursued as a means to aid intensive, industrialized production of livestock?

Contrary to what proponents of animal cloning say, a clone is clearly not just a twin. At a time when consumers are becoming increasingly more conscious of how their food is produced and how animals are raised for food—issues ranging from organic standards, to additives and hormones, to cage-free eggs, to free-range beef—it is important to call attention to these hidden costs. Even if it is safe to eat, is a more uniform or better marbled slab of beef really worth it? Just because a food can be produced, should it be?

Also, many Americans are wondering, will animal cloning pave the way for human cloning? As it is, researchers in England are pushing to create human-animal hybrid embryos by fusing a human cell to a rabbit egg. The more commonplace such genetic or reproductive manipulations become, the harder it will be to have a discussion about the ethics of such practices and impose any meaningful sorts of limitations.

I was happy to see that Rick Weiss followed up with an article more focused on the ethical issues related to animal cloning ("Religion a Prominent Cloned-Food Issue," Oct. 19). Articles such as that are important for stimulating public discussion. And while the FDA's responsibility is to look at science and not ethics, we clearly need a forum—such as an ethical advisory committee—to more thoroughly discuss the serious animal welfare and ethical concerns associated with cloning animals for food. This needs to happen before the FDA makes a decision on allowing cloned milk and meat onto our grocery store shelves. **AV**

Nina Mak, AAVS Research Analyst
The Washington Post
Submitted October 23, 2006

Letting the Cat Out of the Bag:

AAVS Exposes the Truth About Pet Cloning

By Nicole Perry, AAVS Outreach Coordinator

It began with a dog named Missy.

On a whim in 1997, an Arizona billionaire asked his entrepreneurial friend to help him find a team of scientists who could clone his beloved companion, a border collie husky mix. He poured millions of dollars into what became both the "Missyplicity Project" and a now-defunct, California-based company called Genetic Savings & Clone, Inc. (GSC Inc.).

GSC Inc. funded a number of cloning experiments at Texas A&M University but was unsuccessful in cloning Missy or any other dog. One result of the Missyplicity Project, however, was a small tabby cat named CC, short for Copy Cat.

The news of CC sparked the inception of the notorious pet cloning industry, and GSC Inc. intended to capitalize on it. Soon, this company and others began 'banking' DNA from companion dogs and cats for future cloning, demanding anywhere between $295 to $1,395, plus $100-$150 annually for storage fees. However, GSC Inc. surpassed other pet cloning companies by going beyond just DNA banking and started advertising that it could actually clone cats. GSC Inc. sought six orders from members of the public who wished to have a cloned version of their feline companions. The price? Fifty thousand dollars.

Cruelty and Deception

From the outset, AAVS opposed this excessive and exploitative business, a mere moneymaking scheme that harmed both humans and animals. Pet cloning companies like GSC, Inc. exploited tender emotions, such as grief, and led the public to believe that deceased pets could be 'resurrected' through new cloning technology. Additionally, most people assumed that cloned animals were virtual 'carbon-copies,' but, in truth, animal cloning experiments have revealed otherwise.

While a cloned animal is almost genetically identical to the original animal, there is no guarantee that he or she will physically resemble the original animal.[1,2] Even CC, the first cloned cat, did not have the orange markings of her calico clone. In addition, there is no assurance that a clone will share any behavioral traits with the original animal, unless a behavior is breed-specific. Cloning scientists at Texas A&M University compared the behavior of cloned and naturally bred pigs and found that, "…the goal of using nuclear transfer to replicate animals to reproduce certain behavioral characteristics is an unrealistic expectation."[3]

Further, those who sought to clone a companion animal were likely unaware of the experimental nature of cloning and the animal suffering it inevitably involves. The public hardly hears about animal cloning failures. However, in discussions and papers published about cloning, it has become apparent that animals suffer a variety of consequences in cloning experiments.

Scientists routinely refer to cloning as a new and "inefficient" technology citing low average survival rates of between 0.5-4.0 percent for cloned embryos.[4] Cloned animals who actually survive birth can suffer unpredictable, serious health consequences (e.g. early onset of cancer, developmental problems, sudden death).[5,6,7] In addition, animal cloning technologies are still very new, and the long-term effects on cloned animals, particularly animals such as cats, who live long lives, have yet to be adequately measured. Therefore, each time a company attempts to clone an animal, it must be recognized as experimental.

AAVS Responds

AAVS sought to bring forth the truth about pet cloning. If the public recognized the hypocrisy involved in an industry claiming to value companion animals yet caused them tremendous harm, AAVS predicted public support would drop significantly.

To begin the process, AAVS launched an educational website, www. NoPetCloning.org, which explains the science and ethics involved in pet cloning, using expert opinions, news articles, and a unique "Adopt a Clone" feature. Matching real companion animals with their shelter look-alikes, AAVS sought to draw attention to the numerous animals waiting for adoption in animal shelters.

Many people do not realize the connection between pet cloning and the crisis of dog and cat overpopulation. Although cloning essentially requires three animals—the individual to be cloned, the surrogate mother, and the cloned offspring—many, many more are used in the process. If they are not euthanized, these 'surplus' animals may be adopted into private homes after use, but companies are not required to have them spayed and neutered. U.S. shelters are already teeming with animals, and an estimated 3-4 million are euthanized each year for lack of homes.[8] By creating even more companion animals, pet cloning companies are adding to the overpopulation problem.

In a further effort to educate the public, AAVS released a report, "Pet Cloning: Separating Facts from Fluff." The report includes references to scientific literature and the results of an independent public survey commissioned by AAVS, which found that 80 percent of people in the U.S. are opposed to pet cloning.

AAVS worked with some of these concerned citizens in California to help establish Californians Against Pet Cloning (CAPC). With the help of California Assemblyman Lloyd Levine, CAPC introduced a bill to ban the retail sale and transfer of cloned and genetically modified pets in California. Although this bill died in committee, the fact that it was championed by 21 groups and numerous individuals adds support to public opposition to pet cloning.

Next, AAVS broadened its endeavors by seeking federal regulation. AAVS filed a legal petition with the U.S. Department of Agriculture (USDA) asking the agency to regulate companies that clone and genetically modify pet animals. Maintaining that companies attempting to clone pet animals are research facilities, AAVS argued that they should be held to the same standards as laboratories. Specifically, AAVS demanded that animals used in pet cloning experiments be covered under the federal Animal Welfare Act (AWA).

As a result of AAVS's public outcry, the USDA now requires pet cloning companies that exhibit clones at trade shows to apply for animal exhibitor licenses, and those who sell to pet stores must register as animal dealers. Although USDA did not comply with the primary reason AAVS filed the petition, the agency did revise its Policy #10 to clarify that animal cloning facilities are not automatically exempt from registering as research facilities. Instead, USDA will review a facility's cloning activities on a case by case basis to determine its regulatory status. As licensed dealers, exhibitors, and research facilities, animal clone producers are required to meet the AWA's humane care regulations that include providing adequate veterinary care.

Conclusion

The pet cloning industry has treated companion animals as nothing more than commodities: producers and products. Companies have even offered gift certificates and a refund or exchange if an animal becomes 'defective.' Cloning a companion animal exploits many animals—from the colony of surrogate mothers who are injected with hormones and implanted with cloned embryos, to the cloned offspring, who may or may not survive. With its No Pet Cloning campaign, AAVS let the cat out of the bag.

Thankfully, at the end of last year, GSC Inc. shut its doors forever. Not surprisingly, the company claimed there was little demand for cloned cats and dogs. **AV**

RESOURCES

[1] Piedrahita, Jorge A. and Thomas, Greg. "Cloned Pigs Differ from Originals in Looks and Behavior" North Carolina State University. Retrieved on February 27, 2007, from http://www.ncsu.edu/news/press_releases/03_04/113.htm.

[2] Archer, G.S., Dindot, S., Friend, T.H., Walker, S., Zaunbrecher, G., Lawhorn, B., & Piedrahita, J.A. (2003). Hierarchical Phenotypic and Epigenetic Variation in Cloned Swine. *Biology of Reproduction, 69*:430–436.

[3] Archer, G.S., Friend, T.H., Piedrahita, J., Nevill, C.H., & Walker, S. (2003). Behavioral variation among cloned pigs [Erratum]. *Applied Animal Behaviour Science, 82*(2):151-161.

[4] Paterson, L., DeSousa, P., Ritchie, W., King, T., and Wilmut, I. (2003). Application of reproductive biotechnology in animals: implications and potentials. *Animal Reproduction Science, 79*(3-4):137-143.

[5] Rideout, W.M., Eggan, K., and Jaenisch, R. (2001). Nuclear Cloning and Epigenetic Reprogramming of the Genome. *Science. 293*: 1093-1098

[6] Schatten, G., Prather, R., and Wilmut, I. (2003). Cloning Claim Is Science Fiction, Not Science. *Science. 299*:344.

[7] Wilmut I., Beaujean N., de Sousa P. A., Dinnyes A., King T. J., Paterson L. A., Wells D. N., & Young L.E. (2002). Somatic Cell Nuclear Transfer. *Nature. 419*(6907):583-6.

[8] HSUS Pet Overpopulation Estimates. (2006). Retrieved on March 20, 2007, from http://www.hsus.org/pets/issues_affecting_our_pets/pet_overpopulation_and_ownership_statistics/hsus_pet_overpopulation_estimates.html.

NEWSNET

GRID-TECHNOLOGY USES COMPUTERS, NOT ANIMALS

A new project funded by the European Union (EU) will design a database that could spare the lives of millions of animals used in research. Just in time for the implementation of REACH (Registration, Evaluation, and Authorization of Chemicals, a program that will retest all chemicals of one metric ton or more that are manufactured or imported into the EU), this technology could be used to evaluate the risks of chemicals without the use of animals.

Known as Chemomentum, the database will be constructed with grid-technology, a cluster of computers that can process large amounts of data expeditiously. Chemomentum will contain information about chemical compounds and computer models that run virtual tests. For example, researchers will be able to change the chemical structure of a compound and watch its interaction with a target. Compound structures can be changed repeatedly so that researchers may analyze the effects.

Fundamentally, this technology could eliminate the need for experimental animal tests. Instead, users would input information into the system and view the results on screen. This is called predictive testing, and it is more cost-effective and less laborious than animal tests, traits that are appealing to any company.

Mathilde Romberg, a research fellow at the University of Ulster in Ireland and a partner in the Chemomemtum project, predicts this technology will reduce the number of animals used in toxicity tests. She says the system should "help the chemical industry and European regulatory bodies evaluate the substances and assess related risks, with fewer and fewer animal tests."

It is estimated that at least 10-11 million animals are used annually in the EU alone. Technologies such as Chemomentum could begin to decrease this number and eventually make animal testing obsolete. AV

British Government Rethinks Animal-Human Hybrids

In a controversial move, the British government may put the breaks on a plan to ban the creation of animal-human embryos. The change comes after a group of nearly 45 researchers, policy-makers, and academics published an open letter in the *UK Times*, claiming that a ban would stymie scientists. In addition, two teams of British researchers have applied for permission to create such hybrids, and a third has announced it has plans to apply if the previous applications are approved.

The researchers plan to use animal-human hybrids (also known as cybrids) to create stem cells for use in studying diseases such as Alzheimer's and Parkinson's. Their goal is to eliminate the need for donated eggs, which are hard to come by since the process requires women to undergo hormone injections and surgery. In addition, human stem cell research is a hotly debated subject at present. Rather, they propose to take DNA from human patients and insert it into an empty animal cell, creating a cybrid embryo, should the methodology work.

Just like cloning and other animal experiments, creating cybrids is a cruel and unnecessary procedure. Unlike the human DNA donors, animals who give up their eggs are not volunteers and undergo invasive procedures to remove their eggs. They experience many of the same conditions as other laboratory animals, such as confinement, untreated ailments, and eventual death. Moreover, data obtained from animal and cybrid experiments are not readily extrapolated to humans, so the process is inefficient. Those seeking to find cures for human disease would do better using human cell cultures or computer simulations.

Jose Cibelli, a researcher who patented the so-called interspecies cloning technique, is doubtful that the proposed experiments will work. Cibelli, who will soon publish a scientific paper detailing the failure of his attempt to clone monkey genes in cow eggs, explains, "It could be that we are doing something wrong. But it looks like the farther apart the species are on the evolutionary tree, the harder it will be to clone." AV

European Consumers Value Animal Welfare

A popular survey known as the Eurobarometer reports that consumers in the European Union (EU) are willing to pay more for products that meet animal welfare standards. In fact, 62 percent of those surveyed claimed they would alter their shopping habits in order to access more animal welfare friendly goods. However, the report also revealed that the EU public believes it is not given enough information to make good decisions regarding such products.

The Eurobarometer indicates that animal welfare is a key issue for EU citizens. On average, they rate it 8 out of 10 in terms of importance. Most believe animal welfare has improved in their country, although 77 percent feel more improvements could be made. In particular, Greeks (96 percent), Cypriots (91 percent), and Portuguese (90 percent) would like better treatment of animals in their countries.

A great majority of respondents applauded the idea of labeling products that meet animal welfare standards, since it would aid them in buying more compassionate items. In addition, over 70 percent approved of the suggestion to reward companies who apply high animal welfare standards.

Overall, the survey makes an impressive claim for better treatment of animals. Markos Kyprianou, the EU Commissioner of Health, said, "The message from EU citizens is clear—they view animal welfare as a priority and are willing to contribute to its promotion." AV

Canadian College Enacts Moratorium on Animal Testing

Located between Lake Erie and Lake Ontario, Brock University (BU) sits on Canada's Niagara Penninsula with the high distinction of being a biosphere reserve, a territory created to promote harmony between humans and the environment. It is not surprising, then, that students and faculty at the institution are concerned with the treatment of animals at their school.

After photographs of BU's laboratory animals appeared on its website, many students were shocked by the conditions the animals endured. The photographs featured rats housed in tiny containers who were being used in psychology experiments. However, once concerns were raised, the pictures quietly disappeared from the website, but the students' sentiment remained.

Clearly, BU students and faculty feel they are not well informed of the cruelties occurring on their campus. John Sorensen, a professor of sociology at BU, claims he was repeatedly denied information about the institution's animal experiments. "If this was such wonderful work that people were doing, you would think that they would be proud of it, not trying to hide it," he said.

The department of sociology, along with the masters program in Social Justice and Equity, recently declared a moratorium on animal research in their departments, pending further investigation into the issues. The moratorium proposes that "all information involving research on animals be made open to public scrutiny..." and "that any future research be undertaken with the same level of ethical standards that are applied to research with human subjects and that a principle of 'no harm' to all research subjects, regardless of species, be adopted."

Grant Klacko, a member of the BU's Animal Rights Club, agrees the moratorium is a step in the right direction, but he also hopes it will affect larger change at the school. Ideally, he said, "I would love to see all animal testing stopped at Brock." AV

Ireland May Be First to Ban Primate Experiments

Each year, nearly 10,000 primates are used for research in the European Union (EU), and many more are held at breeding facilities, which specifically supply animals for these purposes. However, a recent bill proposed by Ireland's Green Party and the Irish Anti-Vivisection Society could officially ban primate research from the country, which is one of the EU's 27 member states.

Ireland is in good company. Great Britain, New Zealand, Sweden, and The Netherlands have banned experiments on Great Apes, a family that includes gorillas, chimpanzees, bonobos, orangutans, and humans. Unfortunately, many other primates who are not considered Great Apes continue to be used in these and other countries. For example, marmosets and macaques are the most commonly used primates. Also used are tamarins, spider monkeys, squirrel monkeys, and owl monkeys. If passed, Ireland's Primate Bill would extend to all of these animals, giving the country a unique chance to take the moral lead in banning all primate experiments.

Scientifically, there are drawbacks to using primates or other animals to study the human condition. For example, different species respond differently to chemicals, infections, and diseases. These reactions are often exacerbated by stress brought on by laboratory confinement, which can alter the metabolic process of all animals, including humans.

Although it has been at least 10 years since the last primate experiment was performed in Ireland, there is no law that prohibits researchers from using the animals again. Ireland's Department of Health, which licenses animal experiments in the country, contends that it has a policy against licensing projects involving primates. However, Green Party member Dan Boyle insists that, if approved, this bill would give legal validity to formally stopping this practice. AV

MEMBERS

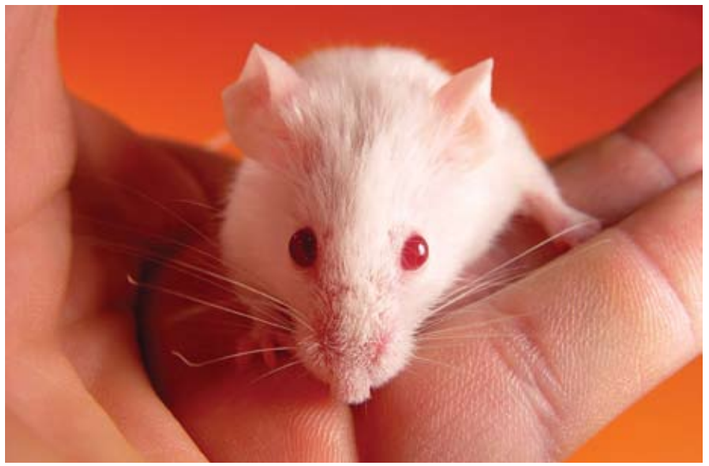
GoodSearch.com: Supporting AAVS's work for animals is only a click away!

Did you know you can support AAVS by searching the internet? A new website, www.GoodSearch.com, allows you to do just that.

Founded by Ken Ramberg, former founder of JOBTRAK, a division of Monster.com, and JJ Ramberg, MSN anchor, GoodSearch.com allows internet users and supporters of AAVS like you to raise money for AAVS while searching the internet.

How does GoodSearch.com work? It's simple. Powered by Yahoo!, the site works like any other search engine, but each time you use it, money is generated for AAVS. Last year, search engines generated close to $6 billion in revenue from advertisers. GoodSearch.com donates 50 percent of its advertising revenue—currently equaling 1 cent for every search—to designated charities including AAVS. A penny does not sound like much, but they do add up. Just think how many times you click your mouse every day!

Start using GoodSearch.com as your main search engine today, and be sure to pass this message on to your friends and family. If you have any questions, please contact Heather Gaghan at hgaghan@aavs.org or Chris Derer at cderer@aavs.org.



AAVS Memorial Fund

A unique way of paying tribute to kindred animals and animal lovers while making a gift in their name to help stop animal suffering. All AAVS memorial gifts are used for continuing our mission's work of ending the use of animals in biomedical research, product testing, and education.

Memorial donations of any amount are greatly appreciated. With a donation of $50 or more, your memorial will also be acknowledged in a special recognition section of AAVS's Annual Report. At your request, we will notify the family member or other individual you have remembered as a memorial gift to AAVS.

Tributes

In memory of William Cave.
Patricia Greenhood
Los Altos, CA

In memory of our companions: Sally, Nelly, Bert, Penny, Ginger, Lucy, and Max. We still remember all the fun we had and look forward to being together again.
Margaret Heinemann and Diane
Mays Landing, NJ

In loving memory of Ming, a kitty who received all the love we could give.
Louise Simmons
Harrison, NY

In loving memory of Tynan.
Elizabeth Parks
Micanopy, FL

In memory of Rainbow my first love. You touched my soul. Wait for me at the Rainbow Bridge, I'm coming soon.
Deborah A. Pietrzak
Pittsburgh, PA

In memory of Minute, my dear little calico cat.
Mrs. Leon C. Hauser
Chicago Ridge, IL

Tina Nelson Sanctuary Fund

This fund was established to honor the memory of Tina Nelson, AAVS's Executive Director from 1995-2005. Sanctuaries and their work to provide a safe haven for animals who were once used in laboratories or exploited in other ways were a cause very dear to Tina's heart. She was a constant champion for all animals and was especially drawn to the plight of primates used in research. This fund will provide support for sanctuaries that provide homes for animals in need, and will also provide a lasting legacy for Tina's visions and AAVS's mission to end experiments on animals. If you would like more information on the Fund, please feel free to visit us at www.aavs.org and click on the Support AAVS tab to learn more about the woman who inspired the Fund, and how to make a donation.

One act of kindness can be your legacy, too.

Nearly 125 years ago, AAVS was founded by social visionary Caroline Earle White. Knowing that small acts of kindness can make a difference for animals, she tirelessly worked to improve the lives of those who were in need of loving homes, labored on city streets, and suffered in laboratories.

Make her legacy yours.

You can help ensure that Caroline Earle White's vision and the work of AAVS continues far into the future. For information on estate planning and becoming a member of the Caroline Earle White Society, please return the attached form, or call (215)887-0816.

aavs
American Anti-Vivisection Society

Caroline Earle White Society

ENSURING YOUR VOICE CONTINUES TO BE HEARD FOR THE ANIMALS

Over the years, many of our members and supporters have made provisions to include AAVS in their wills, trusts, life insurance policies, and retirement accounts.

Making a planned gift to AAVS is one of the most powerful ways you can help us reach our goal of ending the use of animals in biomedical research, product testing, and education.

To recognize the thoughtfulness and generosity of those who have chosen to provide for AAVS in their estate plans, we have created The Caroline Earle White Society, named in honor of our founder. If you are interested in becoming a member of The Caroline Earle White Society, please contact Heather Gaghan, Director of Development & Member Services at (215)887-0816.

- ❑ Please send me information on the benefits of supporting AAVS through planned giving.
- ❑ I have provided for AAVS through my will, retirement plan, life insurance policy, and/or other planned gift.

Name:_____

_____

Address:_____

_____

City:_____

State/Zip:_____

Phone:_____

E-mail:_____

Please return coupon to:
AAVS, Attn: Heather Gaghan
801 Old York Rd., #204
Jenkintown, PA 19046-1685

ARDF UPDATE

WHAT'S THE BIG IDEA?

Throughout this issue of the *AV Magazine*, articles have informed readers of a crisis in modern scientific experimentation, populated by an alarming number of players who choose to push ahead with technology that causes suffering in animals, in spite of the lack of public acceptance.

The following question might have occurred to readers who care about animals: Wouldn't it be great if we could turn this trend around and channel new technologies in positive ways in order to help animals instead of harming them?

That is a big idea, and the field of alternatives provides a way forward. That is why AAVS established the Alternatives Research & Development Foundation (ARDF), which funds and promotes the development of new, non-animal, alternative methods for basic biomedical research, product testing, and educational demonstrations.

ARDF is showing that alternatives are better, more humane tools for conducting research. That perspective builds a unique bridge between the community of animal advocates and enlightened researchers seeking to answer legitimate scientific questions that may impact public health and safety. ARDF funds the development of technological innovations that benefit humans and spare animals.

ARDF grants have included the development of a remarkable, yet simple method in small and medium scale production of monoclonal antibodies that is becoming more widely adopted. If the trend continues, ARDF expects that its efforts will have impacted over a million animals a year who would have been used in a common monoclonal antibody production technique called ascites, which involves stimulating a typically painful disease state in mice in order to collect fluid from needles inserted into their abdomens, sometimes repeatedly, over days.

But what use is a new method if no one is using it? Because the field of alternatives research is young and somewhat unique in that it brings together scientists from a wide variety of disciplines, meetings and conferences are vital in order to facilitate the efficient relay of information among industry researchers, academic scientists, and government regulators. ARDF both sponsors and participates in national and international meetings that advance the adoption of alternatives.

This summer, ARDF is co-sponsoring the Sixth World Congress for Alternatives and Animal Use in Life Sciences, in Tokyo, Japan, recognizing that research laboratories using animals

Wouldn't it be great if we could turn this trend around and channel new technologies in positive ways in order to help animals instead of harming them?

are increasing activities in Asia, and alternatives could gain a foothold if given a chance.

Readers of *AV Magazine* who wish to be a part of the exciting field of alternatives development are needed to support this important work. Donations are tax-deductible and can be sent along with the coupon on the right to the AAVS office, using the envelope in the center of the magazine, or to the Foundation directly at ARDF, 801 Old York Rd., #316, Jenkintown, PA 19046. Call (215)887-8076 for more information.

❑ YES!

I want to support alternatives development and help save animal lives.

Name:

Address:

City:

State/Zip:

I would like to make a donation in the following amount:

- ❑ $1,000
- ❑ $500
- ❑ $250
- ❑ $100
- ❑ $50
- ❑ $25
- ❑ OTHER* $_____

* A donation of any amount would be greatly appreciated.

Please check one:

- ❑ I have enclosed a check.
- ❑ I have enclosed a money order.

or please bill my:

- ❑ Visa ❑ MasterCard

Credit Card Number

Exp. Date

Signature

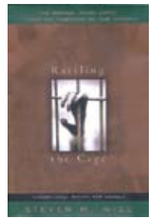
Please return completed coupon and your donation in the enclosed envelope to:

ARDF
801 Old York Rd., #316,
Jenkintown, PA 19046

Ordering merchandise from AAVS is another way to support our important work.

AV Magazine special

BUY BOTH WISE BOOKS AND SAVE EVEN MORE. **ONLY $25!**



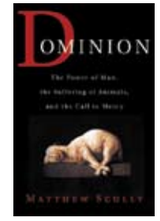
Sale! 13.95 bk-55
Rattling the Cage: Toward Legal Rights for Animals
by Steven M. Wise
Argues the need to extend fundamental rights and liberty to animals.

Sale! $13.95 bk-58
Drawing the Line: Science and the Case for Animal Rights
by Steven M. Wise
A sequel to *Rattling the Cage*, Wise makes the case for animal rights, citing the law and scientific evidence.

You'll find books, shirts, and more to help educate yourself and others about the plight of animals in laboratories.

Blow Out Book Sale!

Sale! $14.95 bk- 64
The Complete Vegan Cookbook
by Susann Geiskopt-Hadler & Mindy Toomay
Over 200 vegan recipes to tantalize your taste buds.



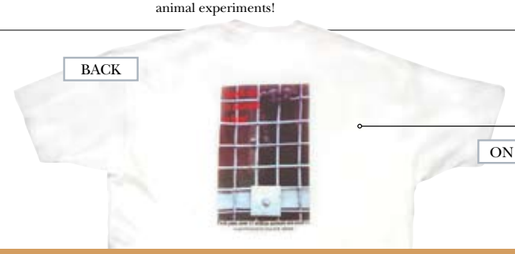
Sale! 10.95 bk-67
Dominion: The Power of Man, the Suffering of Animals, and the Call to Mercy
by Matthew Scully
A new and insightful portrait of the way society views animals.

$12 ts-30
Ladies fitted camisole with bra.
Lips taste better when they're cruelty-free.

$10 mi-10
AAVS logo tote bag
Show others how you feel about animal experiments!

$3 mi-2b
AAVS logo mug

$10 ts-43
Reach out to animals in laboratories!



ending the use of animals in science
aavs
American Anti-Vivisection Society
800-SAY-AAVS

Item No.	Quantity	Size	Description	Price
			Sub-Total	
			PA Sales Tax 6% (residents only, only non-clothing items)	
			Shipping (add $3)	
			Total	

Name:
Address:
City: State: Zip:
Phone: E-mail:
❑ Visa ❑ MasterCard
❑ I have enclosed a check or money order.
Card Number:
Exp.Date:
Total $:
Signature:

Please complete this form and send it with total payment, including postage, to: AAVS, 801 Old York Rd., #204, Jenkintown, PA 19046. You may also telephone your order M-F 9 am-4 pm E.S.T. at (800)SAY-AAVS. Please allow 2-4 weeks for delivery. E-mail jsinnamon@aavs.org if you have any questions.

Find more merchandise by visiting our website at www.aavs.org.

Just because we can, doesn't mean we should.

Animal cloning has a 1% success rate and involves much suffering as animals endure multiple invasive procedures and are born with serious health problems and deformities. The FDA may soon allow animals to be sold for food.

aavs
American Anti-Vivisection Society

Learn More. Act Now.
www.EndAnimalCloning.org

The American Anti-Vivisection Society
801 Old York Rd., #204
Jenkintown, PA 19046-1685
A Non-Profit Educational Organization
Dedicated to the Abolition of Vivisection