lar offenses. Animal-control agencies frequently deal with chronic offenders of leash laws and other ordinances, so recidivism is a good measure of the impact of such laws. Prior to Multnomah’s revised dangerous-dog law, 25 percent of all biting dogs had bitten someone else within one year. Under the new regulations, that rate fell to 7 percent. The number of bites in the community has dropped by about 8 percent since 1987 and the number of dangerous-dog cases presented to animal-control officers has dropped by 18 percent. Mr. Oswald notes that the program has also been an outstanding vehicle for educating the public and community leaders to the need for responsible pet ownership and responsive animal control. He observed, “We were facing a 75 percent cut in funding, but being able to document the effectiveness of our program helped lead to full reinstatement of our budget in a very competitive fiscal arena.”

Despite the dramatic rise in awareness of the problems caused by dangerous dogs, the widespread adoption of dangerous-dog laws, and continued successes against dog-fighting, there seems to be little evidence in most areas that the dangerous-dog situation is improving. What is preventing effective solutions?

We know from the experience of Multnomah County and others that strong dangerous-dog laws with good enforcement can work. However as cities are increasingly facing fiscal crises, animal-control budgets are usually among the first to be cut. John Snyder, past president of the National Animal Control Association, said, “In the last year, I have heard many horror tales about governments taking away what little resources those agencies have. The public demands and expects animal-control services, but they have no idea of what is needed to do it right.”

Perhaps the main reason why progress has been limited is that animal-control agencies and local humane societies, with sparse and often diminishing resources, are attempting to deal with dangerous-dog problems that have very deep human roots. The underlying causes are the ways people breed, raise, train, socialize, and supervise their animals. It is time to look at what individuals, rather than governments, can do to end the dog-bite epidemic.

Puppy mills and many other breeders continue to engage in widespread breeding of dogs without concern for their inborn temperament. As more people have acquired dogs primarily for protection, there has been a rapid rise in the number of questionable animals from guarding and fighting breeds finding their way into naive or irresponsible hands. The result has been an increase in problems associated with protective breeds such as chows and rottweilers that have traditionally shown few problems in the past.

Not all bite problems can be blamed on those people seeking or breeding animals for protection. For example the traditional “family” dog breeds—Labrador and golden retrievers and cocker spaniels—were involved in more than 12 percent of the severe attacks in Palm Beach County, Florida, in 1991. This may be in part due to breeding that ignores temperament, but aggression problems can also result from improper socialization, training, and care. Pet owners and individual dog owners, as well as shelters and humane societies, prevent the dogs they love from becoming part of the dog-bite problem.

If you are among the growing number of people seeking a dog for protection, you should seriously assess your needs and motives. Few people really need a guard dog. For most families an “alert” or “nim­­age” dog who will sound the alarm or look intimidating without actually showing aggression can provide protection without the risk. Nearly any dog provided with love, care, and proper training can develop the kinds of bonds to people that allow him/her to fill this need while remaining a safe family companion, so follow the HSUS suggestion to “adopt one” from your local shelter.

Be sure your pet is spayed or neutered. Statistics show that unsterilized animals make up a majority of the biting population.

Urges those who continue to breed dogs to exercise care and restraint to preserve the breeds they love. A high rate of breeding of any breed, particularly one with a guarding or fighting history, not only contributes to pet overpopulation but can also quickly lead to declines in health and temperament standards. The damage that has been done to the reputation and quality of today’s “problem” breeds such as rottweilers, Doberman pinschers, and chows may take years to undo.

All dog owners should socialize and train their dogs early and well. Training need not be aimed at meeting some competitive standard. For most pet owners, the primary goal of training should be to build a bond of trust and understanding, to set appropriate limits, and to help the dog behave in a responsible manner. The emphasis should be on safety, not control or dominance.

If one establishes a firm foundation of basic obedience, correcting most dog-behavior problems at an early stage becomes much easier.

We need to teach children and others how to behave around dangerous dogs. Mr. Oswald noted that the number of children known to harmless familiar dogs to reduce the likelihood of a bite. Educational materials dealing with bite prevention are available from the HSUS and many local organizations.

Animal-control agencies and humane societies also can focus on preventing dog-aggression problems rather than dealing only with their aftermath.

Counseling during the adoption process should educate new and prospective pet owners about animal behavior so that they can have realistic expectations and learn how to avoid problems. Shelters must try to provide resources to deal with minor problems that can escalate to serious aggression. While only a handful of shelters currently employ full-time trainers or animal behaviorists, such services can pay for themselves in the form of better adoption counseling and prevention or correction of common behavior problems that might otherwise lead to the return, abandonment, or impoundment of the dog as a result of a bite incident. If shelters cannot directly provide these resources, they can assist in contacting people in the community who can provide puppy kindergarteners and basic obedience training, and animal-behavior counseling.

Animal protection and animal-control groups can work together for fair danger­­ous-dog legislation with strong enforce­­ment that is designed not simply to respond to dangerous-dog problems, but also to educate the public about responsible pet ownership.

At a time when stories of dog attacks continue to fill the media, it is often easy to forget that most of our more than 50 million dogs never bite anyone. However, the problems caused by the highly visible minority of animals and their owners have far-reaching consequences for all of us who care about the special relationship between people and dogs. Each of us must re­­examine our commitment to seeing that safe and healthy animals share their lives with understanding and responsible owners.

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Researchers at the University of California at Davis opted to splice extra growth-regulating genes from sheep into lambs to avoid the use of human gene tissue because of the views of James Murray, ...transgenes comprised entirely of sheep-gene sequences would be more acceptable to laypersons, in particular to those like Dr. Murray who hoped to develop a strain of sheep whose lambs would efficiently convert their feed and rapidly grow to market size. But the experiments did not develop expectancies and other severe health problems that killed them before they ever reached puberty. Dr. Murray concluded, "The cause of death varied, but there is clear evidence that the overexpression of GH [growth hormone] adversely affects liver, kidney, and cardiac function."

Merk and Company, an international pharmaceutical firm, applied for a patent in Europe on a "superchicken" it called Macro-Chicken. In the hopes of cornering the worldwide poultry market with highly efficient, fast-growing birds, Merck developed the Macro-Chickens, a line of broiler chickens that carry the growth gene from cattle. The chicken, Merck's Macro-Chicken, may well have a variety of health problems, but if the bird eats well and grows quickly, they may be ready for slaughter before severe health problems ever develop. What will happen to the reserve stock of transgenic chickens, the ones not raised for slaughter? Will they suffer?

Because such information is proprietary, corpora­tions are not likely to reveal the problems and risks of their new patented creations. Trade secrets notwithstanding, creating transgenic farm animals has social and economic consequences for farmers, agribusiness distributors, and consumers—consequences that have been given scant attention.

Critics of the genetic engineering of farm animals have echoes of the US Senator Thomas Francis Johnson's use of public funds to make the stock of woolly sheep animals produce more meat (even if it is leaner) when the short- and long-term costs of such research are not considered. The National Academy of Sciences (NAS) report on the problem of modern intensive animal agriculture is overproduction. In many nations, meat and milk overproduction is at present a problem. It is unlikely that the creation of transgenic farm animals will help feed the hungry of the world, since meat-prodution efficiency has risen in limitations and inevitable environmental costs.

Genetic engineers are now attempting to alter milk from such animals so it will be suitable for people who are lactose intolerant. Researchers are inserting into calf embryos the genes responsible for the production of proteins in mother's milk. They hope to create a new generation of cows able to produce "humanized," or more digestible, milk. Such research may be more helpful in feeding the hungry since milk production is far more efficient, ecologically sound, and cost-effective than meat production.

Austrian improvement scientists have used genetic engineering to make sheep produce more wool. The body chemistry of the sheep is altered so the animal can convert sulfafur-containing compounds into methionine, an amino acid that increases wool growth.1 The Australians have also genetically engineered a hormone that can be injected into sheep to make them shed their fleece; it eliminates shearing. Moreover, the horse's gland has caused pregnant sheep to abort. These scientists plan to genetically engineer sheep whose in­cisors erupt from the lower jaw, instead of being worn off by flying insects, which cost the sheep industry $35 million a year in losses. As a spinoff they hope that the sheep will also be able to produce the wool.

Most genetic-engineering research on farm animals has focused on increasing productivity; genetic engi­neering to increase health, however, may well have a variety of health problems, but if the bird eats well and grows quickly, they may be ready for slaughter before severe health problems ever develop. What will happen to the reserve stock of transgenic chickens, the ones not raised for slaughter? Will they suffer?

Such research may be more expensive to the animals made transgenic. Researchers continue trying to identify the genes responsible for various inherited diseases (especially those found in the United Kingdom and developing countries). A key research problem is the identification of the human immune systems to serve as organ donors for people needing new hearts and other organs for transplant. It may be many years before this technology becomes available. The result of much of this research may be genetic engineering to make medical products for humans, but venture capitalists are investing now in this speculative line of research and development.

The result of such costly research may eventually benefit animals. However, this new genetic engineering research on farm animals has focused on increasing animal productivity.

New Animal Drugs

The development of genetically engineered vaccines, hormones, immune-system enhancers, birth-control regulators, and diagnostic tests may benefit animals. However, this gene se­quence of veterinary products and services may also be a mixed blessing. It is not without potentially adverse animal-health, socioecon­omic, and ecological consequences. Such products are no substi­tute for sound breeding, good nutrition, and humane animal husbandry.
Five sheep cloned from a single embryo in England: in a recent poll, fewer than half of the European public questioned thought biotechnological research on farm animals for disease resistance or increased growth should be encouraged.

Notified GenPharm International from Mountain View, California, that patents will soon be issued on two of the company's mice, the TIM (transgenic immunodeficient) and cancer-prone PIM lines. Officials of GenPharm, an emerging and multinationals have been pushing for changes in European patent laws that currently prohibit the patenting of "animals." Two Senate committees effectively squashed the Rosalind and Hatfield bills on the grounds that they would weaken U.S. economic competitiveness in the world marketplace.

Some 145 patent applications for genetically engineered animals are now awaiting approval at the U.S. Patent and Trademark Office. Approximately 80 percent of such patent applications have medical utility, while the remainder involve agricultural animals. One possible explanation for the delay in awarding new animal patents is that, to date, there is no clear regulatory structure for the commercial marketing of transgenic animals. 

The Senate is currently considering a bill (S. 1291) sponsored by Senator Hatfield who introduced a five-year moratorium on the granting of patents on invertebrate and vertebrate animals, including those that have been genetically engineered. Senator Hatfield's bill (H.R. 4499) was introduced in the House by Rep. Benjamin Cardin in April 1992. The HSUS supports both bills.

On the day Senator Hatfield introduced this statement from The HSUS appeared in the Congressional Record, in order to reap the full benefits of advances in genetic engineering biotechnology, the social, economic, environmental, and ethical ramifications of genetically engineered, cancer-prone mouse. Since then no other animal patents have been awarded in the United States. 

Although the genetic engineering of animals is not seen as obstacles to economic growth and industrial expansion, the gap between private (corporate) and public interests, an informed public can direct the policy-making process. Advances in science and technology, in biotechnology in particular, may then serve the public good and help enhance the quality of life and the environment alike. Today the U.S. government is attempting to deregulate the entire biotechnology in particular, may then serve the public good and help enhance the quality of life and the environment alike. Today the U.S. government is attempting to deregulate the entire biotechnology industry, and the European Community's Commission on Biotechnology is trying to eliminate socioeconomic considerations in the licensing of new animal drugs. Clearly the biotechnocracia of the industrialized world is proceeding neither prudently nor appropriately. 

Despite the many documented health problems of transgenic mice carrying human, bovine, rat, and sheep growth genes, research continues with farm animals. One must wonder how such suffering can ever be justified, when transgenic pigs, designed to be leaner, have been rigorously evaluated. To question this development should not be misjudged as antiscience or antipig. Without greater involvement, an independent, informed public can direct the policy-making process. Advances in science and technology, and in biotechnology in particular, may then serve the public good and help enhance the quality of life and the environment alike. Today the U.S. government is attempting to deregulate the entire biotechnology industry, and the European Community's Commission on Biotechnology is trying to eliminate socioeconomic considerations in the licensing of new animal drugs. Clearly the biotechnocracy of the industrialized world is proceeding neither prudently nor appropriately.

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