

Breeding and Welfare in Companion Animals

Roger Gale MP and Lord Soulsby of Swaffham Prior

We jointly acted as hosts to a Reception for the Companion Animal Welfare Council (CAWC) on 16th May 2006 at the House of Commons to mark the publication and launch of the CAWC Report on Welfare Aspects of Modifications, through Selective Breeding or Biotechnological Methods, to the Form, Function, or Behaviour of Companion Animals.

The cover illustration to the report shows a magnetic resonance image provided by Clare Rusbridge MRCVS of the head and neck region of a 16-month, female cavalier King Charles spaniel (which had a 3 month history of yelping and tendency to scratch at the right shoulder). The back part of the brain is pushed into the canal into which, normally, only the spinal cord passes. Resulting abnormal cerebrospinal fluid pressure in the spinal cord has caused syringomyelia – the formation of fluid filled cavities in the spinal cord. This disease which is due to a hereditary mismatch of brain and skull design, resulting in inadequate skull capacity, occurs commonly in Cavalier King Charles spaniels and is associated with signs of chronic, and in some cases severe, neck pain in a proportion of affected dogs.

This condition illustrates how selection for particular traits can have unforeseen serious side effects on welfare. Although the particular aspects of appearance or behaviour the then breeders were wittingly or unwittingly selecting for, that led to this disease, is unknown. The Cavalier King Charles Spaniel breed was developed in the 1920s in response to a reward offered for

recreating a toy spaniel with a longer nose as depicted in portrait paintings of King Charles II. The modern breed is descended from about six animals.

There has been a rapid growth in the number of species of vertebrates and invertebrates kept as companion animals and, in the UK, this exceeds 1000 vertebrate species alone. Many hundreds of these species are bred for this purpose. A considerable number of species have been selected for specific traits, or suites of traits, for countless generations (eg dog, cat, rabbit, pigeon, goldfish) and include breeds that differ markedly in appearance from their wild ancestors. There has been a great drive for novelty amongst companion animal breeders.

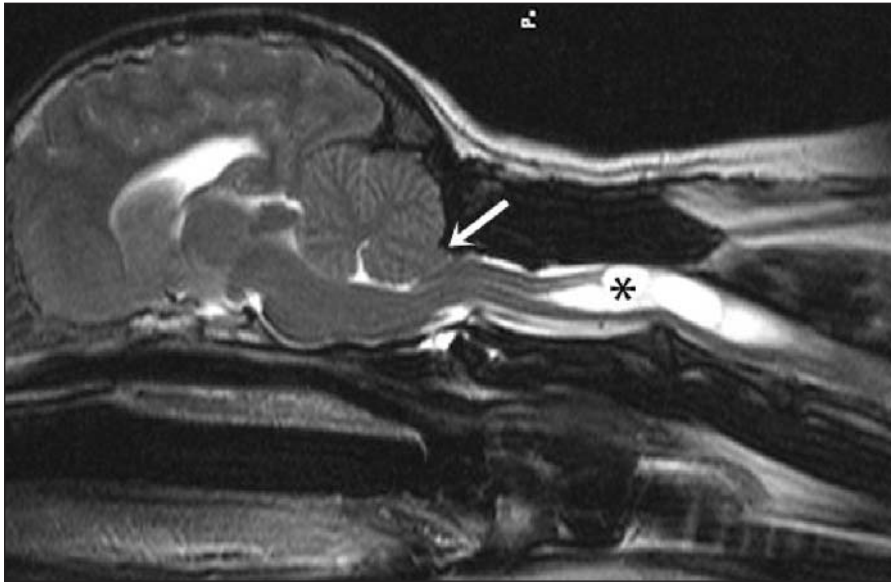
Historically at least, most companion animal breeding has been undertaken in pursuit of specific aspects of performance, appearance and temperament (eg speed, size, colour, shape and behaviour) with little or no specific regard to the possible welfare consequences.

The “creation” of new strains, characterised by these and various other features, is, with few exceptions driven, not by a process of actively generating new forms – it is nature that does this – but by actively selecting and breeding from “new” mutant forms that arise spontaneously or from those individuals that most nearly approach the ideal being selected for. The process works largely by not breeding from those animals that do not meet the ideal being selected for, rather than by accelerating the breeding of those

that do.

Protected from the rigours of natural selection, under human stewardship, individuals can survive and breed that would not do so in the wild. The very strong constraints to so-called desirable traits and other aspects of biology imposed by survival of the fittest in the wild are relaxed through captivity/domestication, and this has opened the way for the extraordinary diversification of forms that has occurred.

The methods that have been used in the development of companion animal breeds – breeding from small numbers of animals in the selection of particular traits and the use of sibling or parent matings in the “fixing” of these traits in “true-breeding” lines – tend all too often to lead to significant inbreeding and the accumulation of potentially harmful alleles. As a result many problems with clear welfare consequences are known to have arisen in association with selection for specific traits or suites of traits. These include, to give some examples: hip displacia in dogs; osteosarcoma (bone tumors) in giant breeds of dogs; predisposition to intervertebral disc disease in dachshunds; brachycephalic airway obstruction syndrome in bulldogs; various problems in Manx cats such as mega colon and constipation; predisposition to squamous cell carcinoma in white coat colour cats; glaucoma in Siamese cats; baldness in Sphynx cats with increased potential for sunburn and climatic discomfort in cold weather; lethal white overo syndrome in horses from breeding two overo paints (coloured breeds in horses) leading



Chiari Malformation and syringomyelia in a cavalier King Charles spaniel

We are grateful to Clare Rusbridge BVMS DipECVN MRCVS for this Midsagittal T2* weighted MRI of the brain and upper cervical spinal cord from case 52, a female CKCS that had signs of pain from 1.7 years old. Clinical signs included yelping whilst scratching at the right shoulder area. This was more likely when she was excited.

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to atresia coli and gut blockage; tumbling in pigeons with tumbling in flight; predisposition to vitamin A deficiency in white canaries and complications in health associated with long fur rabbits. These are a few examples across the range of companion animal species that have a genetic basis for conditions which may seriously compromise welfare. Welfare problems associated with genetic changes to the phenotypes of animals can be particularly serious in that:

- (i) they can affect a large number of animals
- (ii) they have the potential to do so for many generations into the future
- (iii) they can have a serious adverse impact on animals' feelings (eg through pain or increased fearfulness) and,
- (iv) these effects can be of long duration – potentially affecting the animal throughout its life (and they may also affect lifespan)

New techniques in breeding are increasingly being explored. These

include genetic engineering and cloning.

Genetic engineering is the use of artificial means to manipulate gene combinations in organisms. A transgenic animal is one whose DNA includes genetic material (one or more genes) from another species. The use of genetic engineering is currently largely confined to farm and laboratory animal industries. However, some have predicted that it may not be long before this technology is more widely applied in companion animals.

It is to be hoped that, in the future, genetic engineering techniques could be used to benefit the welfare of companion animals through the replacement of harmful alleles with healthy ones. This methodology may offer an approach to tackling some of the genetic problems that have been created through selection for particular breed traits. The high prevalence of specific diseases within certain breeds suggests that a limited number of loci underlie some of these diseases and it has been suggested that determination

of the genetic basis of these problems may be more tractable in dogs than in humans. Modern genetic methods have been used for genetic manipulations in farm animals aimed at health improvements such as increased resistance to infections and infestations. Such approaches may come to be applied in companion animals also in the future. However, the technology is not without potential welfare costs and these would need to be carefully taken into account in considering any proposal to use the technology for such purposes.

Despite initial doubts that cloning was ever likely to be applied in the companion animal field, it now appears that it could come to be applied extensively and gene banking services are now being set up whereby clients pay for the storage of genetic samples from their companion animals from which it may be possible to produce clones in the future.

In contrast to society's apparent concern for the welfare of animals and for strict animal welfare regulation, it seems that an almost unquestioning acceptance continues to prevail regarding the selection and breeding of companion animals for arbitrary traits, despite the great potential for serious welfare consequences.

The CAWC therefore proposes the following brief code based on the Council of Europe Convention (Council of Europe, 1987):

“The selection and breeding of companion animals can result in, or perpetuate, characteristics or inherited conditions that seriously affect the quality of animals' lives. No one should breed companion animals without careful regard to characteristics (anatomical, physiological and behavioural) that may put at risk the health and welfare of the offspring or the female parent.”

The complete report may be obtained from the CAWC Secretariat at: The Dene, Old North Road, Bourn, Cambridge, CB3 7TZ; or downloaded from the Council's website at www.cawc.org.uk or www.companionanimalwelfarecouncil.co.uk.