

Progress in purebred dog health since the Bateson report of 2010.

Just occasionally, a landmark event triggers lasting animal welfare change. So it was for farm animal welfare with a book called *Animal Machines* published in 1964 by Ruth Harrison (Harrison, 1964). The book alerted the general public to the suffering of intensively farmed calves and chickens and prompted the Brambell Report that developed a list of five freedoms for farmed animals and prompted the establishment of the Farm Animal Welfare Advisory Committee (Brambell, 1965). Now fifty years after publication, the legacy of *Animal Machines* is greater public engagement in the welfare standards behind the food that they eat, improved scientific understanding of animal welfare and multiple legal reforms. These advances continue to positively impact the quality of life of millions of farm animals today.

It took another forty-four years for a similar landmark event in companion animal welfare but it finally came in 2008 with the BBC documentary *Pedigree Dogs Exposed* produced by Jemima Harrison (BBC, 2008). *Pedigree Dogs Exposed* raised the spectre of inherited health problems in pedigree dogs which were ascribed to obsession with breed purity via closed stud books (McGreevy, 2007), structured inbreeding (Leroy, 2011) and reproductive dominance of popular sires (Calboli et al., 2008), and to conformational exaggeration driven by inappropriate breed standards (McGreevy and Nicholas, 1999). With an estimated 8-10 million dogs in the UK (Murray et al., 2010, Asher et al., 2011, PFMA, 2012), 75-80% of which are purebred (O'Neill et al., 2014, PFMA, 2012), the potential dog welfare issue identified was enormous. Three major reports were subsequently published (Bateson, 2010, APGAW, 2009, Rooney and Sargan, 2010) which aimed to identify the scale of the problem and to recommend reforms. The best known of these reports, the Bateson Inquiry, duly concurred that current dog breeding practices did in many cases impose welfare costs on individual dogs and proposed five recommendations to address inbreeding, inherited disease and selection for extreme morphology: systematised collection of anonymised veterinary clinical data, establishment of an Advisory Council on Dog Breeding, revisions to Kennel Club (KC) breed standards, an upgraded KC Accredited Breeder Scheme and improved support by the veterinary profession for prevention of breeding-related problems. It is now over five years since *Pedigree Dogs Exposed* was first aired, longer than the average generation time for most dog breeds (Leroy et al., 2006), and thus timely to evaluate the responses to the Bateson Inquiry.

Directly compliant with a Bateson recommendation, a PhD study supported by the RSPCA and based at the Royal Veterinary College and University of Sydney aimed to develop veterinary clinical data sharing for epidemiological research. This VetCompass project has grown to become the largest single resource of epidemiological data on dogs in the UK, currently sharing 4.8 million clinical records covering 770,000 animals (including 391,000 dogs) from over 200 veterinary clinics. (June 2014) (VetCompass, 2014). Although the PhD was awarded in May 2014, the VetCompass database is a legacy project that will grow indefinitely, enabling ever more comprehensive epidemiological studies to improve animal welfare.

The health of crossbred and purebred dogs was compared based on longevity and disorder prevalence. Crossbred dogs lived 1.2 years longer on average than purebred dogs (O'Neill et al., 2013a). Otitis externa, periodontal disease and anal sac impaction were the most common disorders in dogs but crossbreds dogs had lower prevalence compared with purebreds for only three of the twenty most prevalent disorders (otitis externa, obesity and skin masses) (O'Neill et al., 2014). These results suggest that a hybrid vigour effect does exist in dogs but has greater effect on general characteristics such as longevity and less effect on predisposition for common disorders.

By contrast, VetCompass studies have identified breed type as a major influence on dog health. Longevity varied widely between breeds, from 5.5 years in the Dogue de Bordeaux up to 14.2 years in the Miniature Poodle (O'Neill et al., 2013a). In-depth disorder studies showed breed predispositions in the Border Terrier and German Shepherd Dog for epilepsy (Kearsley-Fleet et al., 2013), the Cocker Spaniel and Cavalier King Charles Spaniel for chronic kidney disease (O'Neill et al., 2013b) and the Yorkshire Terrier for diabetes mellitus (Mattin et al., 2014). This novel evidence indicates that focus on reducing high-risk disorders in individual breeds should promote substantial welfare gains in dogs.

In 2010, selected by open competition and comprising experts in areas of relevance to its remit, the Advisory Council on the Welfare Issues of Dog Breeding was formed, with Professor Sheila Crispin as founding chair (Advisory Council on the Welfare Issues of Dog Breeding, 2014). The Advisory Council was established as a non-statutory body and was funded by donations from specific animal welfare charities. The Council aims to provide independent, expert advice and make recommendations on methods and priorities for improving the welfare issues of dog breeding. An ambitious schedule of ten projects was

outlined to fulfil these aims (Crispin, 2012). Since formation, the Advisory Council has been very active and has contributed in areas including independent advice to government, a web-based advice tool on puppy-buying, recommendations for addressing eight key welfare priorities and interaction with diverse relevant stakeholders. The Advisory Council has been a strong force for change to improve dog welfare and continues to work on novel projects to achieve these aims in collaboration with other groups.

The Bateson Inquiry recommended revision of KC breed standards to avoid selection for extreme morphologies. Recent research has described conformational associations with intervertebral disc extrusion (Packer et al., 2013) and explored owner perceptions of the welfare impact of brachycephaly (Packer et al., 2012). Following the Bateson Inquiry, the KC accelerated its programme of change to improve dog health and welfare. Breed standards were comprehensively reviewed by the KC in 2009 and a programme called Breed Watch was instigated for breeders and show judges to report changes that cause concern. A list of high profile breeds with exaggerations that can cause pain or discomfort was designated and the Best of Breed individuals for these breeds are subject to veterinary health checks at General and Group Shows (The Kennel Club, 2014a). Additionally, the KC continues to actively support research to better understand the genetics and epidemiology of canine disease (Mellersh, 2014, Lewis et al., 2011).

The KC has updated and extended the older Accredited Breeder Scheme which now has been renamed the Assured Breeder Scheme (ABS) and has United Kingdom Accreditation Service (UKAS) accreditation. The scheme is supported by 24 regional advisors across the UK and states that all ABS members are inspected prior to receiving accreditation and at least once every three years thereafter. The ABS incorporates 6-monthly reviews of breed health requirements and recommendations that aim to keep pace with changing knowledge on health in individual breeds (The Kennel Club, 2014a). Puppies born from bitches which have previously had two caesarean sections will no longer be registered. The KC now offers an online service called Mate Select covering registered dogs that shows health test results, inbreeding coefficients and estimated breeding values (The Kennel Club, 2014b).

The Bateson Inquiry was critical of the veterinary profession for not taking the lead in reasonable actions to reduce inherited welfare problems in dogs. The profession was encouraged to share anonymised clinical data for epidemiological research, work to reduce the incidence of specific disorders and provide support to enforce dog breeding legislation. In

response, hundreds of UK practices now collaborate with welfare-centric projects such as VetCompass, showing strong support from the practising arm of the veterinary profession for an evidence-based approach to breed-related issues. Veterinary surgeons attend Crufts to health-check the 14 high-profile breed with conformational issues (Anon, 2013). However, although veterinary surgeons are encouraged to report caesareans and conformation-altering surgery on dogs registered with the KC, only 2.7% of all caesareans reported to the KC in the first six months of 2012 were submitted by vets (Llewellyn, 2013).

This editorial began with a review of the 50-year impact that a single book *Animal Machines* and the consequent Brambell report had on the welfare of future decades of farm species. It is only 5 years since *Pedigree Dogs Exposed* and the consequent Bateson Inquiry but we already recognise raised public awareness of welfare issues within dog breeding (Nicholas, 2011) and significant actions from multiple stakeholders. However, it is perhaps yet too early to show deep and long-lasting welfare improvements for dogs; this may require many years or even decades. But at least the foundations for change have been laid and it now behoves all of us, whether owners, breeders, vets, regulators or welfare scientists, to work together and play our part to build a better future for man's best friend.

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