Non-conform Evidence: The Impasse of 1990s Welfare Research

The political mainstreaming of welfare issues was a boon for animal welfare science. Founded during the 1960s and navigating a tumultuous political marketplace during the 1970s, animal welfare science rapidly institutionalised during the 1980s and 1990s: funding levels and publications increased, welfare researchers obtained chairs at prestigious universities, and the discipline gained greater political influence on British and European decision-making bodies. Mirroring the rise of organic agriculture,¹ farm assurance schemes and quality-assured welfare labels presented a second important way of influencing welfare standards.² However, despite scientists' improved influence and resources, fundamental questions about how to define and measure welfare remained open. Previously favoured welfare definitions were challenged by non-conforming results including stereotyped 'abnormal' behaviour in healthy animals, stress in animals voluntarily performing 'natural' behaviour like mating, or sub-clinical disease in 'normally' behaving animals.³ While most researchers remained confident in their ability to produce meaningful results,⁴ animal welfare science entered a prolonged phase of epistemic

¹ Kirchhelle, *Pyrrhic Progress*, 244–245.

² Food Ethics Council and Heather Pickett, *Farm Animal Welfare*, 10.

³ Ian J. H. Duncan, "Science-based assessment of animal welfare: farm animals," *Revue scientifique et technique – Office International Epizooties* 24 (2) (2005), 483–484.

⁴ Millman et al., "The impact of applied ethologists," 306–308.

navel-gazing. In 2008, senior researcher David Fraser noted that its value-laden character made it doubtful whether welfare could ever be formally defined.⁵

Fraser's statement is indicative of the epistemic challenges and increasing heterodoxies faced by most expanding disciplines like that of classic ethology around 1970 (Chap. 10). Although *Web of Science* is far from exhaustive, does not include official reports, and underrepresents pre-digital and non-English contributions, a search for publications mentioning 'animal welfare' indicates a surge of outputs from the 1980s onwards. The 1970s had seen an average of seven dedicated welfare publications per year.⁶ This number increased over fourfold to 33.5 publications per year during the 1980s. By the 1990s, it had risen by a further fivefold to an average of 183.9 publications per year. Ahead of the US (3513, 17.7 per cent of 19,838 publications) and Germany (2048, 10.3 per cent of 19,838 publications), Britain (England, Wales, Scotland, Northern Ireland) contributed the most publications (3835, 19.3 per cent of 19,838 publications) with the Universities of Bristol (538), Edinburgh (337), London (317), Oxford (204), Newcastle (202), and Cambridge (200) emerging as the most significant research hubs.⁷

The surge of publications was paralleled by a further institutionalisation of the veterinary and behavioural welfare sciences. Founded in 1966 and opened to non-veterinarians from 1970 onwards, the Society for Veterinary Ethology began hosting international meetings from the 1970s onwards and was renamed International Society for Applied Ethology (ISAE) in 1991. By 2003, the ISAE had 729 members from around the world. While the ISAE's *International Journal of Applied Behavioural Sciences* (formerly ethology) remained influential, new journals like the UFAW's *Animal Welfare* (est. 1992) were created to serve the growing needs of the community.⁸ Animal welfare science's expanding influence was reflected in Britain's university landscape. In 1977, John Webster was appointed to Bristol's Chair of Animal Husbandry. In the same year, Marian Dawkins obtained a permanent lectureship (by 1998, a professorship) in zoology at the University of Oxford. In 1986, the University of

⁵ Fraser, "Understanding Animal Welfare," *Acta Veterinaria Scandinavica* 50/ Supplement (2008), S1.

⁶ An exceptional 28 publications appeared in 1979.

⁷ Web of Science, "Web of Knowledge" search of term "animal welfare" [05.04.2020].

⁸ Millman et al. "The impact of applied ethologists," 300 & 309; Petherick and Duncan, "The International Society for Applied Ethology," 34, 39–47.

Cambridge's Department of Clinical Veterinary Medicine appointed Donald Broom to the first dedicated chair of animal welfare science.⁹

It would, however, be wrong to think of animal welfare science as a phenomenon limited to universities and political committees. As described by Emma Roe and Henry Buller, the field's growth was also aided by the rise of welfare as an economic value.¹⁰ Although radical protesters continued to oppose intensive farming per se,¹¹ the mainstreaming of welfare values (Chap. 11) led to a mutually beneficial cooperation between researchers, industry, and established animal charities.

By the late 1980s, major retailers and producers began to see farm animal welfare not only as a factor whose absence might impede productivity but also as a value whose certifiable presence might boost sales on the relatively homogeneous market for animal products.¹² The demand-led trend towards the value-based segmentation of the British food market was already evident in the consistent growth of sales of 'naturally' or 'organically' produced food, which was now on offer in major supermarkets like Safeway, Waitrose, Sainsbury's, Tesco, and Marks & Spencer.¹³ It was also affecting environmental and welfare practices on conventional farms. In the poultry sector, consumer preferences drove a gradual shift of egg production from battery cages to free range and deep litter systems. In pig production, consumer demand and lower costs made a substantial number of producers adopt straw-based indoor or extensive outdoor systems.¹⁴

Because it was impossible to 'see' added ethical or health values in a product, a thriving certification industry emerged to aid the growth of

⁹ "UFAW Medal for Outstanding Contributions to Animal Welfare Science – past awards", *Universities Federation for Animal Welfare*, <https://www.ufaw.org.uk/ufaw-medal-for-outstanding-contributions-to-animal-welfare-science/ufaw-medal-for-outstanding-contributions-to-animal-welfare-science-past-awards> [13.04.2020].

¹⁰ Buller and Roe, *Food and Animal Welfare*, 49–51.

¹¹ Tester, "The British Experience," 241–251; Howkins and Merricks, "Dewy-Eyed Veal Calves," 85–103; Buller and Roe, *Food and Animal Welfare*, 45–46; Linda Merricks, "Green Politics," 437–442; Roscher, *Königreich*, 419–504.

¹² Buller and Roe, *Food and Animal Welfare*, 49–51; see also: Henry Buller, "Animal welfare: from production to consumption," in H. Blokhuis et al. (eds.), *Welfare quality: science and society improving animal welfare* (Wageningen: Wageningen Academic Press, 2013), 49–69.

¹³ Kirchhelle, *Pyrrhic Progress*, 244.

¹⁴ Food Ethics Council and Heather Pickett, *Farm Animal Welfare*, 8–10; Martin, *Development of Modern Agriculture*, 124.

premium segments of the food market. Certification and farm assurance schemes created a lucrative win-win-win alliance between three distinct actor groups: consumers who wanted to acquire and support the production of food with ‘superior’ ethical and health qualities; retailers and producers who wanted a means to designate and add financial value to food produced according to higher voluntary standards; and animal protection organisations that wanted to raise welfare standards and their own income by endorsing and policing specific practices via labels.¹⁵ Exacerbating the 1980s’ breakdown of agricultural corporatism (Chap. 11), the “virtuous bicycle”¹⁶ of assurance schemes further shifted power away from official, producer-focused entities like MAFF towards privatised, consumer-oriented solutions in a marketplace that was increasingly dominated by large supermarkets and vertically integrated agribusiness.

The organic sector led the way. In 1973, the British Soil Association had already begun to certify that members were producing organic food according to strictly defined methods. This informal certification scheme was officially recognised by the 1987 UK Register for Organic Food Standards and the 1989 Organic Standards. European standardisation followed with the 1991 EEC Council Regulation (2092/91) on organic production of agricultural products.¹⁷ Conventional producers also recognised the advantages of assurance and labelling schemes. Reacting to food scares and foreign competition, the British and Scottish governments attempted to boost sales of domestic products via assurance schemes like the Food from Britain scheme (1984–1993), the Scottish Livestock Assurance Schemes (1987), and the Quality Meat Scotland scheme (1991).¹⁸

Large-scale assurance schemes that specifically targeted animal welfare emerged in the 1990s. Inspired by the success of organic labelling and Audrey Eyton’s *Kind Food Guide* (1991),¹⁹ the RSPCA collaborated with retailers and producers to create its Freedom Foods Label in 1994. The move was backed by surveys, which found that 95 per cent of consumers favoured welfare labelling. MPs from all parties praised the fact that consumers would “for the first time (...) be offered a clear choice of meat and

¹⁵ Buller, “Animal Welfare: from production to consumption”; Food Ethics Council and Heather Pickett, *Farm Animal Welfare*, 18–19.

¹⁶ Food Ethics Council and Heather Pickett, *Farm Animal Welfare*, 19.

¹⁷ Kirchhelle, *Pyrrhic Progress*, 244; Food Ethics Council and Heather Pickett, *Farm Animal Welfare*, 11.

¹⁸ Food Ethics Council and Heather Pickett, *Farm Animal Welfare*, 11.

¹⁹ Audrey Eyton, *The Kind Food Guide. Kinder to animals – much kinder to you* (London: Penguin, 1991).

dairy products that have been produced with high standards.”²⁰ Non-statutory welfare labelling presented a “commercial opportunity for farmers who place a high regard for the care and protection of their animals” and would provide “a basis for a gradual and steady improvement in the welfare of Britain’s 750 million farm animals.”²¹

Freedom Foods was also an opportunity to deescalate confrontations on the public ‘frontstage’ of farm animal welfare politics. By defining the “consumer as a positive figure,”²² politicians, industry, and the RSPCA opened a mutually beneficial ‘backstage’ debate about how welfare and market demands might meet. Access to this corporate backstage was restricted, and there was limited opportunity for protests. Consultations over what constituted welfare and how it could be assured were conducted by senior retailers, producers, RSPCA officials, and experts. Internal and external opposition against RSPCA engagement with industry could be deflected by referencing income being generated for RSPCA work in other areas, the fact that consumers wanted labels and that public campaigns for statutory change remained possible. Meanwhile, retailers offering Freedom Food could defend sales of foodstuffs produced with less stringent criteria by arguing that consumers were free to choose more expensive ethical products. According to Matthew Hilton and others, this notion of market-based citizenship “was consistent with the broader processes of the privatization of politics upon which NGOs sought to capitalize”:

Shopping was an opportunity for the NGO supporter to demonstrate commitment to the cause in a manner which also expressed loyalty to the message put forward by the NGO leadership. (...) What an engagement with consumption enabled was a disciplining of supporter behaviour for even the most passive sympathizer.²³

Not everyone was happy with the shift of welfare politics and standard-setting towards the marketplace. Despite her previous calls for a consumer revolt, Ruth Harrison was unimpressed by the increasing emphasis on

²⁰ House of Commons, Early Day Motion No. 1543, “Freedom Food”, Tabled 19.07.1994, 1993–1994 Session, <https://edm.parliament.uk/early-day-motion/8714/freedom-food> [01.05.2020].

²¹ House of Commons, Early Day Motion No. 1543, “Freedom Food”, Tabled 19.07.1994, 1993–1994 Session, <https://edm.parliament.uk/early-day-motion/8714/freedom-food> [01.05.2020].

²² Hilton et al., *Politics of Expertise*, 215; on front- and backstage welfare politics see, Cassidy, *Vermin*, 205.

²³ Hilton et al., *Politics of Expertise*, 215–216.

individual choice and too-close alliances with industry. In 1994, she joined Joyce D'Silva (Compassion in World Farming) and Joanne Bower (Farm and Food Society) in criticising the RSPCA's 'Freedom Food' label in the *Times*. The Freedom Food label supposedly guaranteed farm animals' basic freedoms from fear, distress, pain, injury, disease, hunger, thirst, and discomfort. However, the three critics attacked its toleration of practices such as tail-docking, beak trimming, and sow stalls.²⁴ According to the *Observer*, Harrison was "frustrated because she feels something positive could have been achieved, but instead the RSPCA will betray the trust of consumers who place their confidence in the charity's name":

It makes me profoundly unhappy, because I don't think they merit that trust. Their idea is you start with weak standards and improve them every so often. But once farmers have invested in a system, they're not going to change it every year. It's pie in the sky.²⁵

Despite Harrison's criticism, assurance schemes with welfare elements continued to surge. In 1996, the mad cow disease (Bovine Spongiform Encephalopathy) crisis devastated Britain's beef industry and created a widespread moral panic about the health and ethical hazards of intensification.²⁶ Trying to restore trust, the government and industry designed new quality assurance schemes like the British Lion Scheme for eggs with compulsory vaccination against salmonella (1998) and the NFU's Red Tractor Scheme (2000).²⁷ Both initiatives proved popular among producers. Although critics periodically bemoaned weak inspection and welfare standards,²⁸ the Red Tractor Scheme covered nearly 100 per cent of UK-farmed salmon, 90 per cent of pigs and poultry, over 80 per cent of cattle, and 65 per cent of sheep in 2014. The premium welfare sector also expanded. Between 1994 and 2014, the number of British terrestrial farm

²⁴ D'Silva, Joyce et al., "Freedom food that fails the animals", *Times*, 09.07.1994, 19.

²⁵ "Consuming Passions", *Observer*, 10.07.1994, D10–11.

²⁶ Kirchhelle, *Pyrrhic Progress*, 225–226; on moral panics see Nicolas Rasmussen, "Goofball Panic: Barbiturates, 'Dangerous' and Addictive Drugs, and the Regulation of Medicine in Postwar America," in Jeremy A. Greene and Elizabeth Siegel Watkins (eds.), *Writing, Filing, Using, and Abusing the Prescription in Modern America* (Baltimore: Johns Hopkins University Press, 2012), 25.

²⁷ Food Ethics Council and Heather Pickett, *Farm Animal Welfare*, 11.

²⁸ See, for example, Martin Hickman, "The 'good food' stamp barely worth the label it's printed on", *Independent*, 01.05.2012; Ben Webster, "Red Tractor accepts need for change as shoppers want more spot checks", *Times*, 30.07.2018; "Flat House Farm pigs filmed living in 'barbaric conditions'", *BBC News* (24.08.2020).

animals raised according to RSPCA Freedom Foods standards rose from less than 100,000 to over 40,000,000. Major supermarkets also reacted to consumer demand by ending sales of cage-produced shell eggs.²⁹

Growing demand for welfare assurance cemented the societal standing of animal welfare science and unlocked financial resources for researchers in academia and private certification bodies. However, it did not resolve ongoing disagreement about what welfare was. During the 1980s, increasingly sophisticated research on animal preferences, adaptive behaviour, and farm animals' physiology and neurobiology had moved welfare science well beyond early hormonal theories of stress, instinct concepts, and ideals of harmony with nature (Chap. 10).³⁰ However, researchers still found it hard to agree on universal welfare parameters, with some arguing that welfare was about how an animal felt and what it wanted and others arguing for predominantly adaptive physiological definitions of welfare.³¹

Disagreements about how to interpret different indicators affected the discipline's ability to establish coherent international welfare standards. While a 1997 European review of gestation stalls for sows resulted in a 2013 EU ban, an expert report on the same practice in Australia could not identify significant welfare problems. The contradictory outcome was in turn used by the US swine industry to argue that there was inconclusive evidence for the elimination of the stalls.³² During legislative hearings in the US, veterinary and behavioural researchers also disagreed on whether laying hens suffered as a result of forced moulting.³³

Disagreements about methods, indicators, and standards resulted in sustained debates about animal welfare science's methods and effectiveness. In 1995, John Webster's *Animal Welfare: A Cool Eye Towards Eden* launched a scathing attack on the limited scope of welfare regulations, the lack of evidence underpinning much of animal philosophy and activism,

²⁹ Food Ethics Council and Heather Pickett, *Farm Animal Welfare*, 3, 12, 14.

³⁰ Ian J.H. Duncan, "D.G.M. Wood-Gush Memorial Lecture: An applied ethologist looks at the question "Why?," *Applied Animal Behaviour Science* 44 (1995), 205–217; Webster, *Cool Eye*; Marian Stamp Dawkins, "Why has there not been more progress in animal welfare research? – D.G.M. Wood-Gush Memorial Lecture," *Applied Animal Behaviour Sciences* 53 (1997), 59–73; Broom, "A History of Animal Welfare Science," 121–137.

³¹ Broom, "A History of Animal Welfare Science," 127; Duncan, "Science-based assessment of animal welfare," 484–486.

³² Fraser, "Understanding Animal Welfare," S1.

³³ Millman et al., "The impact of applied ethologists," 305.

and scientists' limited influence "on the quality of life for the vast majority of animals reared for food."³⁴ Although the animal welfare movement had had a significant impact on social values, single-sentence definitions of welfare remained inadequate and "a lot of very well-intended welfare research is neither very good science nor very helpful to the animals."³⁵ Webster was particularly sceptical of crude physiological and neurological welfare measures: "My particular *bête noire* is the experiment which seeks only to obtain a so-called 'objective' measure of something which the researcher preconceives to be stress."³⁶ For Webster, welfare definitions and politics should be based on a cost-benefit calculation of the "things we do to animals for our benefit," the "cost to us of acting for their benefit," and the cost to us "of breaking our current association with an animal species."³⁷ Scientists could not answer these issues by themselves but would have to take into account wider considerations of morality, politics, and economics.³⁸

Webster's criticism prompted soul-searching by other researchers. In her 1997 Wood-Gush Memorial Lecture, Marian Stamp Dawkins responded by asking why there had not been more progress in animal welfare research. According to Dawkins, the last 20 years had in fact seen significant progress, but many initial assumptions had proven too simplistic: research had shown that measuring animal consciousness, cognition, and emotions was more complex than expected; it had become clear that behavioural differences between wild and captive animals and 'vacuum' or stereotyped behaviours were not necessarily indicative of suffering; and measuring hormonal stress indicators without simultaneously assessing animals' experiences had proven misguided: "We must not over-simplify that which is complicated."³⁹ This did not mean that research was worthless or not "pragmatic, utilitarian, and circumspect"⁴⁰ enough to produce good standards. Acknowledging complexity was a precondition for meaningful change. This was particularly true regarding animal feelings.

³⁴ Webster, *Cool Eye*, 130.

³⁵ Webster, *Cool Eye*, 240; see also 10.

³⁶ Webster, *Cool Eye*, 241.

³⁷ Webster, *Cool Eye*, 251.

³⁸ Webster, *Cool Eye*, 259.

³⁹ Stamp Dawkins, "Why has there not been more progress," 66; see also: Stamp Dawkins, "From an animal's point of view," 4–5.

⁴⁰ Stamp Dawkins, "Why has there not been more progress," 66.

In her influential 1990 essay “From an animal’s point of view,” Dawkins had already argued that engaging with law-making would require scientists to enter the “muddy waters”⁴¹ of studying positive and negative feelings in more detail. It was easy for activists, politicians, and philosophers to take the “moral high ground” and drive changes in law based on “gut feelings”⁴² about animal preferences. However, resulting laws and standards risked being ineffective. Integrating physiological, ecological, and affective approaches was the best way to develop meaningful welfare guidelines. In the case of animal suffering, Dawkins argued for an inclusive assessment of the ‘canonical costs’ to an animal of preserving its fitness and the ‘perceived costs’ by the animal itself—even if there might be no threat to its physical welfare.⁴³ This required a holistic ethological approach: “You have to be an ethologist as Tinbergen conceived one—that is, to understand, amongst other things, what the animal’s natural behaviour is, what it is adapted to, how it acquires the relevant information as well as how it acquires and processes sensory information.”⁴⁴

For Dawkins, this meant applying complex economics of choice based on comparative demand and income curves to test animal preferences.⁴⁵ Other researchers continued to favour different approaches. In Cambridge, Donald Broom warned against prioritising preference over “direct measures of welfare”:

The term ‘welfare’ should refer to a characteristic of an individual at the time under consideration, that is, to its state rather than to anything which is given to that individual. When conditions are favourable, animals regulate their interactions with their environment without difficulty. Under hostile conditions, animals use various methods to try to counteract the adverse effects of those conditions. These attempts to cope can themselves be measured and, if they fail, adverse effects on the animal can be measured. The welfare of an individual is the state resulting from its attempts to cope with its environment.⁴⁶

⁴¹ Stamp Dawkins, “From an animal’s point of view,” 1.

⁴² Stamp Dawkins, “Why has there not been more progress,” 67.

⁴³ Stamp Dawkins, “From an animal’s point of view,” 3.

⁴⁴ Stamp Dawkins, “Why has there not been more progress,” 72.

⁴⁵ Stamp Dawkins, “From an animal’s point of view,” 1–9.

⁴⁶ Donald M. Broom, “The importance of measures of poor welfare – response to Marian Dawkins ‘From an Animal’s Point of View’,” *Behavioural and Brain Sciences* 13 (1990), 14.

Welfare could be measured on a scale from very good to very poor: if an individual failed to cope with an environment, its life would be adversely affected and welfare was poor; if it coped but with great difficulty, welfare would also be poor. Defending himself against accusations of over-emphasising physiological measurements,⁴⁷ Broom noted that research on animal feelings and preferences provided “valuable indirect measures”⁴⁸ for welfare but had to be contextualised—sometimes animals chose situations that were demonstrably bad for them: “Welfare cannot be assessed by preference studies alone, however; veterinary surgeons’ vast knowledge concerning the recognition of signs of injury or ill health and the rapidly increasing number of other indicators of poor welfare must be used, too.”⁴⁹

Sussex-educated US researcher Joy Mench was sceptical of both approaches. In a 1998 paper for *Applied Animal Welfare Science*, she noted: “There is (...) a growing sense that animal welfare science has reached an impasse and that ethical and scientific questions (...) have become hopelessly entangled.”⁵⁰ Overcoming this impasse would depend on moving beyond the post-Brambell focus on suffering and preference indications to “broader quality-of-life questions.”⁵¹ The 1965 report had stimulated a productive emphasis on the minimisation of pain and suffering. However, this approach was running out of steam. Producers were only slowly adopting new housing systems, and welfare as a definitive concept remained elusive:

Behavioral and physiological measures both have important limitations, may be inconsistent with each other, and can be difficult to interpret because their expression is influenced by many complex factors including individual predispositions. Perhaps more important, there seems no clear way to establish a cutoff point below which welfare is ‘bad.’⁵²

⁴⁷ Broom, “A History of Animal Welfare Science,” 127.

⁴⁸ Broom, “The importance of measures of poor welfare,” 14.

⁴⁹ Broom, “The importance of measures of poor welfare,” 14; see also Broom’s 1998 reply to Mench (discussion below) in which he emphasized the need to measure positive aspects of welfare to balance the field, Donald M. Broom, “Welfare as a Broad Scientific Concept,” *Journal of Applied Animal Welfare Science* 1/2 (1998), 149–151.

⁵⁰ Joy A. Mench, “Thirty Years After Brambell: Whither Animal Welfare Science?,” *Journal of Applied Animal Welfare Science* 1/2 (1998), 91.

⁵¹ Mench, “Thirty Years After Brambell,” 91.

⁵² Mench, “Thirty Years After Brambell,” 92.

The lack of a welfare cutoff and measurement disagreements had resulted in a situation where welfare was defined in minimalist terms to gain agreement on basic principles. Linking welfare to the absence of suffering had also led to the relative neglect of positive feelings and of animal behaviour that could not be linked to suffering.

According to Mench, it was time for scientists “to make an ethical leap”⁵³ and formulate a broader operational definition of animal welfare that incorporated a high level of biological functioning, freedom from suffering, and positive feelings. Taking a “quality of life definition” would help overcome false dichotomies like good and bad welfare, distress and eustress, and luxuries and necessities, because “welfare will depend on the relative preponderance of positive over negative experiences during the animal’s lifetime.”⁵⁴ Established deprivation experiments where the effects of stripping back ‘amenities’ could be measured were perfectly suited to assessing positive feelings.⁵⁵ Findings could be used for an “additive model”⁵⁶ of welfare where one could start enriching existing intensive environments.

Concerned about the effects of internal disagreements on their discipline, Ian Duncan and David Fraser called on welfare researchers to devote less attention to abstract ‘measuring’ debates and concentrate on identifying and solving concrete welfare problems. Many problems like hunger or distress were obvious.⁵⁷ Others entailed a more detailed study of animals’ physiology, preferences, affective states, and the adaptive value of specific behaviour.⁵⁸ Open research questions were, however, no excuse for inaction.

It was also clear that scientists could do more to engage other fields. In his 1999 Wood-Gush Memorial Lecture, Fraser criticised the fact that welfare researchers had been remarkably “selective in acknowledging the role of these ethicists and critics.”⁵⁹ Lack of scientific engagement had been

⁵³ Mench, “Thirty Years After Brambell,” 94.

⁵⁴ Mench, “Thirty Years After Brambell,” 97.

⁵⁵ Stolba and Wood-Gush, “The identification of behavioural key features,” 287–298.

⁵⁶ Mench, “Thirty Years After Brambell,” 98.

⁵⁷ Ian J.H. Duncan, “Thirty Years of Progress in Animal Welfare Science,” *Journal of Applied Animal Welfare Science* 1/2 (1998), 152–153.

⁵⁸ Fraser and Duncan, “‘Pleasures’, ‘Pains’ and Animal Welfare,” 383–396.

⁵⁹ David Fraser, “Animal ethics and animal welfare science: bridging the two cultures – the D.G.M. Wood-Gush Memorial Lecture,” *Applied Animal Behaviour Science* 65 (1999), 173.

“fully reciprocated”⁶⁰ by thinkers like Regan and Singer, who prioritised justice over caring for animals. Fraser instead engaged with philosopher Bernard Rollin’s criticism of positivist welfare research.⁶¹ Scientists and ethicists alike should avoid a priori exclusions of each other’s approaches.⁶² Scientific debates about whether welfare centred on survival, health, and comfort or whether it should also encompass sentience were mirrored in philosophical debates:

Most attempts by scientists to conceptualize and study animal welfare boil down to three key issues: that animals should feel well (...) that animals should function well (...) and that animals should lead natural lives (...). These ideas correspond at least roughly to the concepts of ‘interests’, ‘needs’, and telos, respectively as defined by some philosophers.⁶³

Scientists needed to conduct and contextualise their work within broader care-based ethical frameworks and abandon the idea that research was strictly objective. Ethicists needed to be more specific about the empirical foundations of their frameworks:

I think we can view animal welfare as an evaluative concept (...). Animal welfare encompasses many variables that can be studied scientifically and objectively. However, our decisions about which variables to study, and how to interpret them in terms of an animal’s welfare, involve normative judgments about what we consider better or worse for the quality of life of animals.⁶⁴

Fraser’s call for methodological and interdisciplinary openness proved prescient. While welfare researchers had managed to attain unprecedented influence in academia, politics, and industry, epistemic disagreements threatened to stall the discipline’s momentum. It was by distancing themselves from overly positivist approaches and openly acknowledging their

⁶⁰ Fraser, “Animal ethics and animal welfare science,” 173; see also 175.

⁶¹ Bernard E. Rollin, “Animal Production and the new social ethic for animals,” *Journal of Social Philosophy* 25th special issue (1994), 71–83.

⁶² Fraser, “Animal ethics and animal welfare science,” 177.

⁶³ Fraser, “Animal ethics and animal welfare science,” 178.

⁶⁴ Fraser, “Animal ethics and animal welfare science,” 193; the need to reengage philosophers and ethicists had already been highlighted by University of Colorado ethologist Marc Bekoff in 1991; Marc Bekoff, “The animal’s point of view, animal welfare and some other related matters,” *Behavioral and Brain Sciences* 14/4 (1991), 753–755.

status as practitioners of a value-influenced science that welfare researchers have productively engaged the described *Sinnkrise* of their discipline.

Ironically, part of this process has entailed a return to the explicitly normative considerations guiding early ethologists like Julian Huxley and William Thorpe in their evaluation of animal sentience and humans' obligations towards animals. This does not mean that research has 'regressed' since the 1990s. Their (re-)engagement with ethical considerations instead signals that welfare researchers no longer see themselves as comprising a sub-field that must avoid accusations of anthropomorphism at all costs but rather as a self-confident discipline capable of embracing complexity and avoiding overhasty promises of universal standards.

With senior researchers like Fraser, Webster, Duncan, Broom, and Dawkins now in their 60s, 70s, and 80s, a new generation of welfare scientists has begun to ask different questions and apply new techniques ranging from genomics and epigenetics to machine-learning in order to inform evidence-based veterinary medicine and farm design.⁶⁵ This does not mean that value debates and questions of how to deal with politicians and market actors have disappeared. Edinburgh researcher David Mellor has recently called for a 'positive' reframing of the original Five Freedoms as five welfare provisions with aligned welfare aims. The aim is to avoid popular yet unhelpful conflation of freedoms with rights and to stop primarily defining well-being as the absence of negative experiences.⁶⁶ There are also ongoing debates on non-stun slaughter, the ethical trade-offs involved in reducing antibiotic use, and the use of constructive anthropomorphism in qualitative behaviour assessment.⁶⁷ Agreeing on the relative weighting of different welfare indicators also remains challenging. In 2017, the UFAW organised a symposium titled "Measuring animal welfare and applying scientific advances—why is it still so difficult?" Questions

⁶⁵ For an overview of current techniques see: Michael C. Appleby, Anna Olsson and Francisco Galindo (eds.), *Animal welfare* (Wallingford and Oxford: CABI, 2018).

⁶⁶ David J. Mellor, "Moving beyond the 'Five Freedoms' by Updating the 'Five Provisions' and Introducing Aligned 'Animal Welfare Aims'," *Animals* 6/10 (2016), 59.

⁶⁷ M. Haluk Anil, "Religious slaughter: A current controversial animal welfare issue," *Animal Frontiers* 2/3 (2012), 64–67; Alexander Trees, "Non-stun slaughter: the elephant in the room," *Veterinary Record* 182/7 (2018), 177; Richard Helliwell, Carol Morris, and Sujatha Raman, "Antibiotic stewardship and its implications for agricultural animal-human relationships: Insights from an intensive dairy farm in England," *Journal of Rural Studies* 78 (2020), 447–456; Michal Arbilly and Arnon Lotem, "Constructive anthropomorphism: a functional evolutionary approach to the study of human-like cognitive mechanisms in animals," *Proceedings of the Royal Society B: Biological Sciences* 284/1865 (2017), 20171616.

identified were “Will we ever be able to demonstrate sentience? (...) Are the techniques that we have to study emotional state (affect) adequate (...)? How important is positive welfare? (...)? How robust is the data collected on animal welfare?”⁶⁸

However, these discussions no longer seem to pose a wider *Sinnkrise* for the discipline. Reviving Fraser’s exhortations for scientists to engage other research traditions,⁶⁹ a 2014 FAWC review noted that farm animal welfare was about more than animals. Welfare and welfare politics remained inextricably affected by wider cultural and socio-economic values: “The key issue is that there is no gold standard for animal welfare, i.e. no one absolute measure that always and only identified that an animal has poor or good welfare. (...). Results and observations are interpreted by humans and accepted by some and not others.”⁷⁰ Although hopes for bias-free universal welfare indicators remain, the normative considerations that triggered Ruth Harrison’s initial turn towards animal welfare in 1961 are unlikely to ever disappear from our thinking, research, and treatment of animals.

⁶⁸ Stephen Wickens, Robert Hubrecht and Huw Golledge, “Welcome to the UFAW Symposium,” *Conference Program: Measuring Animal Welfare and Applying Scientific Advances: why is it still so difficult?* 27th-29th June 2017, Royal Holloway, University of London, Surrey, UK; <https://www.ufaw.org.uk/downloads/ufaw-symposium-royalh-2017%2D%2D-conference-booklet-v3-online.pdf> [13.04.2020]; see also similar questions in FAWC, *Evidence And The Welfare Of Farmed Animals. Part 1: The Evidence Base* (London: FAWC, 2014), 3.

⁶⁹ FAWC, *Evidence and the Welfare of Farmed Animals*, 19 (footnote 16).

⁷⁰ FAWC, *Evidence and the Welfare of Farmed Animals*, 34; Buller and Roe, *Food and Animal Welfare*, 33–41.

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