Ageing, health and welfare

We are interested in a range of factors (e.g. stress, pollution, chronobiology, diet, reproduction, epidemiology), how they are affected by ageing and their impact on human and animal health. We integrate research in genetics, animal physiology, and reproduction with the safe and sustainable production of foodstuffs, but in a manner that protects animal health and welfare. Our program works with the Veterinary School and with government agencies (DEFRA), external institutes such as The James Hutton and Moredun Research Institutes and commercial companies involved in animal food production and safety.

Using telomeres to study lifespan
New research led by a team at the University of Glasgow shows that a good indicator of how long individuals will live can be obtained from early in life using the length of specialised pieces of DNA called telomeres. Telomeres occur at the ends of the chromosomes, which contain our genetic code. They function a bit like the plastic caps at the end of shoelaces by marking the chromosome ends and protecting them from various processes that gradually cause the ends to be worn away. This method of DNA protection is the same for most animals and plants, including humans, and the eventual loss of the telomere cap is known to cause cells to malfunction. This study, which was carried out on zebra finches, is the first in which telomere length has been measured in the same individuals from early life and then repeatedly during the rest of their natural lives. The results show that telomere length in early life is strongly predictive of subsequent lifespan.

Thermography: a new tool for assessing welfare
Thermal imaging provides a non-invasive measure of the surface temperature of captive and free ranging species. It has wide applications in the field of physiology and animal welfare. At the University of Glasgow it is currently used in research on the metabolic heat production in seabirds and marine mammals and developing new techniques to monitor avian welfare. For further information please contact Dr Dominic McCafferty (dominic.mccafferty@glasgow.ac.uk, Tel 0141 330 1803).

Improving egg quality
The University of Glasgow has been looking into ways of improving the quality and safety of eggs for over 30 years. Most of this effort to date has focused on looking at factors which either directly or indirectly influence the formation of the egg whilst it is still forming in the hen’s oviduct. We are also interested in developing new tools for assessing egg quality and have collaborated with a range of industrial partners in developing new methods to identify ‘risky’ eggs i.e. those most at risk of cracking or cross contaminating other eggs in a wide range of industrial applications.

Beak trimming in the poultry industry
Dr Dorothy McKeegan carried out a research project commissioned by Defra to examine the welfare consequences of beak trimming in laying hens, a practice which is widely used in the egg industry to prevent feather pecking and cannibalism - a serious welfare issue. Her electrophysiological and anatomical findings showed that a new type of beak trimming using an infra-red beam did not have long term adverse consequences for welfare. The results directly influenced policy, providing scientific justification for an amendment to the regulations to postpone a looming EU directive ban. The research therefore facilitated an evidence-based decision with important animal welfare and economic implications.

Environment enrichment for captive animals
The Institute of Biodiversity, Animal Health and Comparative Medicine has animal facilities, where we work hard to maximise the quality of care provided for the stock we use for research.

For example a study investigating alternative feeding methods for Australian zebra finches, found that allowing them to work harder, in more complex environments for their food, improved their physical and cognitive performance. This knowledge has been applied in other areas where animals are kept such as tigers in zoos, where it has been shown to improve their quality of life.

This expertise in turn, is used to train postgraduate students in animal welfare, ethics and legislation.

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Professor Pat Monaghan, who led the team comments, “Our study shows the great importance of processes acting early in life. We now need to know more about how early life conditions can influence the pattern of telomere loss, and the relative importance of inherited and environmental factors. This is the main focus of our current research, which is funded by the European Research Council.”

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