# Brief summary of the current fish welfare research conducted at the University of Bristol

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The University of Bristol has a long-standing history of animal welfare research during slaughter on various farm animals including fish. Growing numbers of people and industries including major supermarkets (in the UK) are interested and concerned about the welfare of the animals that they are provided from their suppliers. The University of Bristol has obtained an international reputation for providing practical, science-based solutions to improve food animal welfare during slaughter. The recent research on electric stunning of fish (using Rainbow Trout as a model species) under laboratory conditions has explored the neurophysiological behavioural markers for effective stunning of fish, educating a wider audience including animal welfare organisations and the fish farming industry worldwide. The current project funded by the BBSRC and Innovate UK aims to develop the criteria for effective stunning of fish by applying a suitable current for a duration of 1 second to induce immediate stun lasting for a period of effective unconscious allowing the application of a secondary killing method (percussive machine) followed by exsanguination (bleeding to death).

The new findings based on current research data from the University of Bristol (unpublished) suggests that a period of unconsciousness similar to the description published and accepted by EFSA for poultry (e.g. broiler chickens) may be seen in fish: that is, a significant reduction of total power compared to pre-stun power using detailed analysis of EEG (electroencephalogram). Furthermore, our extended research is looking at different frequencies of the applied current as well as the effect of those parameters on flesh quality that would be vital to identifying the balance between good flesh quality versus good fish welfare. Our research has also been carried out directly with Ace Aquatec's current and future innovative technologies (Humane Stunner Universal:HSU) to facilitate the humane slaughter of farmed fish. It is hoped this research will facilitate the fish farming industry's need to scientifically prove that humane electric stunning of farmed fish has taken place. Furthermore, continuous feedback from the salmon farming industry will facilitate further improvement of Ace Aquatec's stunning machines through this industry led research project helping the sustainability of the aquaculture industry around the world.

The current facility for stunning research at Bristol Vet school has its own fish holding facility known as the Langford FishLab and electric/electronic equipment (mimicking commercial equipment) enabling us to generate and modify the electric fields applied to the stunning tank. More importantly we have the facility to monitor and record EEG (electroencephalogram) pre-and post-stunning of fish. We have conducted a series of successful experiments (11 experiments) recording EEG. Later we analysed the data using an analysis of EEG power to develop stunning criteria using Trout as a model species. Our research is guided by a panel of expertise including Dr Jo Murrell (Reader in veterinary anaesthesia, University of Bristol), Mr Steve Wotton (former senior lecturer in farm animal science now Honorary Research associate and consultant on current projects), Prof Toby Knowles (Professor of farming and food Science and lead of Fish research group at Bristol Veterinary School), Dr Jeff Lines (Honorary research associate of University of Bristol and consultant, Silsoe Livestock Systems Ltd, UK) and Dr Nilantha Jayasuriya (Research associate, University of Bristol). If you need further information on our electric stunning research, please contact Dr Nilantha S Jayasuriya on nj16364@bristol.ac.uk. We would be happy to help with any further questions.