

Animal welfare assessment through smartphone applications: challenges and opportunities.

Elisabetta Canali¹, Michela Minero¹, Silvana Mattiello¹, Sara Barbieri¹, Valentina Ferrante¹, Inma Estevez², Cathy Dwyer³, George Stilwell⁴, Emanuela Dalla Costa¹, Monica Battini¹, Francesca Dai¹, Adroaldo Zanella⁵

¹ Department of Veterinary Medicine, University of Milan,

Italy, elisabetta.canali@unimi.it, michela.minero@unimi.it, silvana.mattiello@unimi.it, sara.barbieri@unimi.it, valentina.ferrante@unimi.it, emanuela.dallacosta@unimi.it, monica.battini@unimi.it, francesca.dai@unimi.it

² Neiker-Tecnalia, Arkaute Agrifood Campus, Animal Production, Vitoria-Gasteiz, Spain iestevez@neiker.eus

³ SRUC, Scotland's Rural College, Edinburgh, UK, Cathy.Dwyer@sruc.ac.uk

⁴ Faculdade de Medicina Veterinária, Universidade de Lisboa, Portugal, stilwell@fmv.ulisboa.pt

⁵ Department of Preventive Veterinary Medicine and Animal Health School of Veterinary Medicine and Animal Science, University of São Paulo Pirassununga, Brasil, adroaldo.zanella@usp.br

The European Animal Welfare Indicators Project (AWIN) addressed the development, integration and dissemination of animal-based welfare indicators, with an emphasis on pain assessment and pain recognition. In this framework, AWIN researchers developed practical and science-based welfare assessment protocols for sheep, goats, horses, donkeys and turkeys. With the aim to improve the efficiency of on-farm data collection, AWIN researchers, in collaboration with DAIA Intelligent Solutions S.L., developed dedicated smartphone applications (e.g. AWINHorse, AWINGoat, AWINSheep and IWatch Turkey), freely available at Google Play. The AWIN apps are specifically designed to guide the user step-by-step in the on-farm data collection and to provide an immediate and clear visual output on the welfare status of each assessed farm. Collected data can be stored on the device and, when needed, they can be easily converted in a CSV file, and then sent by email. The visual output (a bar chart) emphasizes positive feedback on the welfare conditions of the animals, allowing the comparison with welfare data of a reference population or other groups of animals of the same farm. One of the objectives of the use of an immediate visual output is to start a dialogue with farmers on the welfare of their animals and the actions needed to improve it. However, there are still some important challenges to be addressed. First of all, to make the reference population more geographically representative, data collection must be undertaken on a larger scale and be more widely distributed. Secondly, even if minimal training is needed to use the apps, no individual or organization can be considered capable of applying the protocol in a robust and reliable way without specific training on how to assess and score the welfare indicators. Finally, in order to increase animal welfare outcomes and enforce animal welfare policies throughout the world, a worldwide server is required to store and analyze the welfare data in a harmonized way.

Key words: animal-based indicators – AWIN – protocol - smartphone application - welfare assessment.