means fully extending all limbs without touching the side of an enclosure, including, in the case of egg-laying hens, fully spreading both wings without touching the side of an enclosure or other egg-laying hens".

The Act, which came into force on 1st January 2015, following a 6-year phase-in period, effectively bans traditional egg-laying battery cages, gestation stalls for sows, and veal crates for calves. Non-compliance may result in a fine up to US$1,000 and/or imprisonment in a county jail for up to six months.

There are a few exceptions during which these new provisions will not apply, including: scientific or agricultural research; examination, testing, individual treatment or operation for veterinary purposes; transportation; rodeo exhibitions, state or country fair exhibitions, 4-H programmes, and similar exhibitions; slaughter of a covered animal in accordance with humane slaughter provisions; and to a pig during the seven-day period prior to the pig's expected date of giving birth.

The industry most affected by the change in legislation is laying hens. California is one of the top 10 egg-producing states in the United States of America (USA), and has a laying hen population of 13 million birds (the total population of laying hens in the USA is 362 million) (USDA 2015). With regards to veal calves, it is estimated that California raises approximately 120,000 each year (an estimated total of 566,000 are reared in the USA each year) (USDA 2014a). It is likely that only a minority of these animals are raised in traditional veal crates since a number of states in America have already banned veal crates and in 2007 the American Veal Association introduced a resolution to phase out veal crates and transition to group-housing by 2017, and many AVA farmers have already converted to group-housed systems. California also houses around 6,000 breeding pigs (1% of the total 6 million breeding pigs in the USA [USDA 2014b]).

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Smartphone App seeks to assist broiler and turkey producers in tracking bird health and welfare

Approximately 17 million broiler chickens and 280,000 turkeys are slaughtered every week in the United Kingdom (UK) (Defra 2015). The majority of these birds are reared in closed-housed systems in large flocks (often several thousand birds) and the environment is carefully controlled (eg temperature, lighting, ventilation, humidity, feed and water are all automated). In the UK, a daily inspection of poultry houses must be carried out to check that birds are behaving normally and that automated systems are running correctly. It can be challenging for poultry producers to assess and record the health and welfare of birds in their care due to the vast numbers of birds and the frequent turnover of flocks.

To assist turkey producers in successfully monitoring their birds a new smartphone App has been developed by Professor Inma Estevez at Neiker-Tecnalia, Spain. Professor Estevez specialises in poultry behaviour and welfare and has been working on the development of turkey indicators as part of the Animal Welfare Indicators (AWIN) project. AWIN is financed by the EU VII Framework Program and seeks to develop animal welfare assessment protocols, with a focus on sheep, goats, horses, donkeys and turkeys. In collaboration with other scientists at Neiker-Tecnalia, Spain, the University of Milan, Italy, and Purdue University, USA, Professor Estevez tested and validated the use of transect walks when sampling commercial poultry (Marchewka 2013, 2015). The team then went on to develop a suitable, and user-friendly platform that poultry producers could use to assess and record information for their flocks.

The result is i-WatchTurkey, a smartphone App available for download from Google Play, which allows users to quantify the health and welfare status of their birds in a standardised and science-based way. Initially, users are required to enter some data specific to their farm and flock by completing a short survey (eg bird strain, age, housing). Following this, users can begin to evaluate their flock by walking in transects through the house and using the touch screen of their smartphone (or tablet) to record their observations. Observations that may be recorded include: immobility, severe lameness, injuries and unwanted behaviours, amongst others. Users may also include other parameters of interest or score birds with multiple problems. The incidence of health and welfare measures collected is automatically standardised by the number of birds in the flock at the time of assessment and the number of transects performed. If using the App in the online mode during inspection, then the date, time, geographic location and weather conditions are also automatically recorded. All data collected when using the App are saved in comma-separated values (CSV) format (which is .XLS compatible) thereby facilitating further analysis if desired. Additionally, the App can automatically

compare a current mean incidence of an indicator with an historical mean (calculated from previous flock evaluations) and will generate a report and warning message if the current mean is significantly higher than the historical mean.

The App states that: "Continuous, easy access to reliable, historical and current information on the health and welfare status of birds in relation to management and environmental factors is an important asset for the decision-making process of companies, helping to improve bird health and welfare based on a methodical and standardized data collection".

Following the development of i-WatchTurkey, a similar App was produced to monitor the health and welfare of broilers: i-WatchBroiler. I-WatchBroiler is also available for download from Google Play.

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