Effective data collection for animal welfare and international development: a case study with Balinese cattle.

Lorna Undy1, Rebecca Doyle1, Stuart Higgins2 and David McGill3

1 Animal Welfare Science Centre, Faculty of Veterinary and Agricultural Sciences, The University of Melbourne, Australia, 2 Agricultural Impact International Pty. Ltd. Freshwater Sydney, 2096 NSW Australia, 3 Faculty of Veterinary and Agricultural Science, The University of Melbourne, Australia.

INTRODUCTION
Capturing animal health and welfare data in the field is a challenge for many researchers and producers.
- Paper-based methods require more time to complete and have greater risks of errors.
- Tablet-based applications have the potential to reduce time and errors, provide real-time feedback to farmers, and work offline.

The aim of this study was to evaluate the practicality of digital data collection in developing countries by assessing Balinese cattle welfare. The case study also investigated the potential for real-time connection between field officers and expert researchers in other parts of the world.

METHODS
Using a modified version of ‘CommCare’, an off-the-shelf tablet-based application, surveys for animal health and production measures were completed by eight unbiased field staff in Bali, Indonesia. The survey questions were based on AssureWel (2013) data.
- 10 days of training
- 3 weeks data collection

28 of the survey questions included animal-based measures, which gave the field staff opportunities to take relevant images. These images were then analysed by an expert in Australia for BCS and cleanliness.

RESULTS
- 60% faster than paper
- Low correlation (r = 0.34 and 0.36 for 2a and 2b respectively) between expert assessment of images and survey results, despite the same average in BCS.

DISCUSSION
- Variation in time taken for field staff to complete the surveys can be attributed to technological skills and level of care taken (Figure 1).
- Low correlation between BCS and cleanliness scores of field staff versus expert despite similar means (Figure 2) indicates that further training to ensure field staff have the technical skills appropriate to assessing BCS and cleanliness.
- Suggestions to improve survey images usefulness in international relationships include a focus on taking high quality, laterally oriented (Figure 3c) images focusing on animal-based measures of welfare.
- BCS scores do not indicate any welfare risk, but the cleanliness measures need further evaluation.
- This survey can assess cattle welfare in the field, and the potential for longitudinal tracking and near real time communication with international partners can be realised through linked photographs.

CONCLUSIONS
- Off-the-shelf applications are becoming more and more a part of agricultural research and development.
- International connections are facilitated by application use, particularly between stakeholders in dairy industry in developing countries and experts in developed countries.
- This case study showed that with increased training to focus on animal-based welfare measures in dairy cattle, app-based data collection and sharing has the potential to improve animal welfare and production measures on a global scale.

The authors would like to acknowledge that the data, research and photos presented in this poster were funded by the Australian Centre for International Agricultural Research and managed by Agriculture Impact International.