

# ISAE 2019

Bergen, Norway

5th-9th August, 2019

Proceedings of the  
53<sup>rd</sup> Congress of the ISAE

ANIMAL LIVES WORTH LIVING

**edited by:**

Ruth C. Newberry

Bjarne O. Braastad



Wageningen Academic  
Publishers

# ISAE 2019

## Proceedings of the 53<sup>rd</sup> Congress of the ISAE

5<sup>th</sup>–9<sup>th</sup> August, 2019  
Bergen, Norway

ANIMAL LIVES WORTH LIVING

edited by:

Ruth C. Newberry  
Bjarne O. Braastad



**Buy a print copy of this book at:**

[www.WageningenAcademic.com/ISAE2019](http://www.WageningenAcademic.com/ISAE2019)

**EAN: 9789086863389**  
**e-EAN: 9789086868896**  
**ISBN: 978-90-8686-338-9**  
**e-ISBN: 978-90-8686-889-6**  
**DOI: 10.3920/978-90-8686-889-6**

**First published, 2019**

© **Wageningen Academic Publishers**  
**The Netherlands, 2019**



*Wageningen Academic*  
*P u b l i s h e r s*

This work is subject to copyright. All rights are reserved, whether the whole or part of the material is concerned. Nothing from this publication may be translated, reproduced, stored in a computerised system or published in any form or in any manner, including electronic, mechanical, reprographic or photographic, without prior written permission from the publisher:

Wageningen Academic Publishers  
P.O. Box 220

6700 AE Wageningen  
The Netherlands

[www.WageningenAcademic.com](http://www.WageningenAcademic.com)  
[copyright@WageningenAcademic.com](mailto:copyright@WageningenAcademic.com)

The individual contributions in this publication and any liabilities arising from them remain the responsibility of the authors.

The publisher is not responsible for possible damages, which could be a result of content derived from this publication.

**Automated tracking of individual activity of broiler chickens**

Malou Van Der Sluis<sup>1,2</sup>, Britt De Klerk<sup>3</sup>, T. Bas Rodenburg<sup>1,4</sup>, Yvette De Haas<sup>2</sup>, Thijme Hijink<sup>4</sup> and Esther D. Ellen<sup>2</sup>

<sup>1</sup>Utrecht University, *Animals in Science and Society*, P.O. Box 80163, 3508 TD Utrecht, the Netherlands, <sup>2</sup>Wageningen University & Research, *Animal Breeding and Genomics*, P.O. Box 338, 6700 AH Wageningen, the Netherlands, <sup>3</sup>Cobb Vantress, *Koorstraat 2*, 5831 GH Boxmeer, the Netherlands, <sup>4</sup>Wageningen University & Research, *Adaptation Physiology Group*, P.O. Box 338, 6700 AH Wageningen, the Netherlands; [malou.vandersluis@wur.nl](mailto:malou.vandersluis@wur.nl)

There is a growing interest in quantifying individual behaviour of group-housed animals and its relation to individual performance. Broiler chickens are an example of a livestock species for which individual data can be valuable. Broiler breeding goals focus on efficient growth and reproduction, as well as welfare indicators for balanced genetic improvements. Recording of broiler behaviour can provide insight into welfare indicators, such as activity or general leg health. However, monitoring individual behaviour in group-housed animals is a challenge. Often, video analyses are used, but these are time-consuming and prone to human error. Therefore, automated systems for monitoring individual animals are desired. Here, we studied whether individual broiler activity could be tracked using an ultra-wideband (UWB) system. Birds were fitted with UWB tags that sent out signals to four beacons. The location of the birds was determined using triangulation of the signal, allowing calculation of distances moved over time. Distances moved according to the UWB system were compared to those found on video for twelve birds. A moderately strong correlation between the UWB system and video tracking was found (Repeated measures correlation,  $r=0.71$  (95%-CI: 0.64-0.77),  $df=209$ ,  $P<0.001$ ). Furthermore, the UWB system was used for assessing individual levels of activity. In total, 137 birds from different genetic crosses were tracked near-continuously for seventeen consecutive days, starting on day 16 of life, and their weight was determined at the start and end of this 17 d period. Data were analysed using an LME-model in R. First analyses showed that activity, measured as the average distance moved, decreased over the seventeen days in all genetic crosses ( $F(1,127.00)=301.47$ ,  $P<0.001$ ). Furthermore, in all genetic crosses, birds with a lower weight at the start of the trial were on average more active ( $F(1,125.14)=9.16$ ,  $P<0.01$ ). Overall, the UWB system appears well-suited for activity monitoring in broilers and the longitudinal information on individual differences in activity can potentially be used to monitor health, welfare and performance at the individual level. Unfortunately, the UWB tags are too large and heavy for day-old chicks to wear and can only be implemented later in life. Therefore, current work is focussing on the implementation of a passive radio frequency identification (RFID) system to track individual broiler activity, using smaller, lightweight tags that can be attached to the broilers' legs at day-old. This system may be able to track individual activity of broiler chickens throughout the entire life.