

Case Study: Revolutionizing Animal Welfare with UWB Technology

Basic Information

- **Name:** Poultry Welfare Research Project
- **Implemented by:** Locatify
- **Implemented in:** 2022-2023
- **Industry:** Livestock Monitoring
- **Customer Website:** <https://www.nature.com/articles/s41598-023-34149-0>
- **Use Cases:**
 - Livestock Monitoring
 - Behavioral Analysis
 - Welfare Optimization
- **Customer's Logo:**



- **Customer Image:**



A broiler chicken wearing a backpack containing a white ultra-wideband tag.

Introduction

The integration of technology in animal welfare has opened new doors to understanding and improving the lives of animals, whether in farms, zoos, or rehabilitation centers. Ultra-Wideband (UWB) technology, often associated with tracking forklifts or enhancing visitor experiences in museums, has recently been adapted to monitor animals in real-time. [Locatify](#), an Icelandic software company specializing in [Sewio UWB](#) systems, collaborated with researchers at Queen's University Belfast at the [Institute For Global Food Security department](#). They studied how UWB can be used to enhance animal well-being in the context of commercial chicken farming and Locatify programmed a statistical analysis of the data.

Background

The Poultry Welfare Research Project aimed to enhance animal welfare and behavioral monitoring in commercial poultry farming. The customer, a leading research institution focused on livestock welfare, sought innovative ways to collect precise, real-time data on the movement and behavior of chickens. Traditional methods of monitoring were inefficient, time-consuming, and often intrusive. To address this, they partnered with Locatify to deploy an advanced

Ultra-Wideband (UWB) tracking system from [Sewio](#) and develop a solution to read the data from the research.

Mary Baxter and Niamh O'Connel were the researchers for the broiler movement project at the Queen's University Belfast in Ireland.

Goals

The primary objective was to develop a high-precision monitoring system capable of tracking individual chickens in real time. The project aimed to:

- Improve poultry welfare by understanding movement patterns.
 - Detect and prevent potential health issues based on behavioral insights.
 - Automate data collection for more efficient research and analysis.
 - Reduce human intervention, minimizing stress on the animals.
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Challenges

Implementing UWB technology in a poultry farm presented several challenges:

- Ensuring accurate tracking in a dynamic and densely populated environment.
 - Developing a solution that was non-intrusive and did not disrupt animal behavior.
 - Maintaining seamless connectivity and data collection in an indoor farm setting.
 - Overcoming potential interference from farm equipment and structures.
 - Managing the vast amount of data gathered from tracking numerous chickens in real time.
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Solution

Locatify provided a UWB-based real-time tracking system from Sewo for livestock monitoring and developed a program to read the movement data. Researchers designed a “backpack” for the chickens with tags.

The solution involved:

- Installation of **UWB anchors** throughout the research facility to provide precise location data.
- Equipping chickens with lightweight, non-intrusive **UWB tags** (Piccolino) to track movement patterns.

- Integrating the tracking system, allowing researchers to analyze real-time and historical movement data.
- Developing a data management solution to process the enormous amount of location data collected.
- Melding and accumulating data from the farm's database and transferring it to a central computer at the university.
- Utilizing **SAGE Analytics tools** to analyze the refined data, ensuring a manageable dataset for behavioral scientists to study.
- Treating and aggregating the database to reduce the dataset size, making it more efficient for analysis.

The entire deployment of the project was completed within two years but each cycle of experiment took 38 days.

Solution Numbers

- **Indoor positioning coverage:** 500 square meters
 - **Number of UWB anchors installed:** 12
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Results

The UWB tracking system provided significant improvements in poultry welfare monitoring:

- Increased accuracy in detecting movement patterns, enabling more precise welfare assessments.
 - Automated data collection reduced manual labor and human error.
 - Improved efficiency in poultry behavior research, with **faster data analysis**.
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Key Criteria for Choosing UWB

- **High precision tracking** for real-time behavior monitoring
 - **Seamless integration** with existing research methodologies
 - **Non-intrusive technology** suitable for animal welfare studies
 - **Automated data collection** for improved efficiency
 - **Scalability** to accommodate future research expansions
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Testimonials

Steinunn Anna Gunnlaugsdóttir – CEO, Locatify

*“We were proud to support innovative **animal welfare research** with the UWB technology. This project demonstrates the power of real-time tracking in providing precise and actionable data for livestock monitoring.”*

Further information:

Further information in Locatify's Blog

<https://locatify.com/blog/how-uwb-technology-can-revolutionize-animal-welfare-a-case-study-on-chickens/>

Further information on the Scientific Reports at the the website Nature.com

<https://www.nature.com/articles/s41598-023-34149-0> There it is stated:

To the best of our knowledge, this study presents the first data on the individual movement patterns of free-moving broilers reared in commercial housing. Overall, there was significant individual variation in the way tagged broilers used the available space that was not clearly explained by gait score or body weight. This wearable technology presents a significant opportunity for advancement in our understanding of the causal factors of individual variation and the complex impact of broiler physiology, personality and environment on welfare measures.

Another article on this subject is in TheConversation.com.:

<https://theconversation.com/backpack-wearing-chickens-are-helping-change-the-way-we-study-animal-welfare-204376>

Call to Action

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- **Website:** www.locatify.com
- **Email:** info@locatify.com