

# BY INVITATION

## Data science at Scio+ drives animal production towards the future

Mikkel Boel



Mikkel Boel is a data scientist at Scio+ R&D working on future applications. He is a trained biologist with a background in the field of functional ecology and behavioral physiology. He has previously worked with quantifying animal behaviors using sensor data to identify factors related to ecology, physiology, and production. Throughout his career, he has worked with developing predictive algorithms for decision support and reduce costs of labor.

### About Scio+

Scio+ is a Danish data-driven company developing solutions for the food production sector. These solutions provide farm production insights by applying data science techniques to production and behavioral data to create production value. Insights from this analysis is provided to customers via easy-to-use interfaces. As a company the focus is on accuracy and data security.

Scio+ is collaborating with broiler experts at Big Dutchman, SKOV and DOL Sensors as well as with leading experts (e.g. animal producers, companies, researchers) around the world, to create data driven insights to optimize the entire production chain.

### Data Collection

R&D at Scio+ focus on the next generation data solutions for the food production industry. The approach is to identify, combine and utilize data-derived knowledge from existing and new sensor technologies. Key information on production, animal behaviors and the rearing environment are collected. The focus is primarily on multi applicable and non-invasive sensors, resulting in minimal disturbances to the production.

Scio+ aim to directly and indirectly detect deviations and abnormalities in the biological processes that influence the production value. This is based on algorithms embedded in systems that process real-time sensor data to provide decision support for meaningful actions to optimize production or manage suboptimal situations. Additionally, data from existing farm equipment is used, such as climate information (e.g. temperature, humidity and air quality (CO<sub>2</sub> and NH<sub>3</sub>)) and feed/water consumption. This data is combined with advanced analyses of water quality, audio, image and video data.

Scio+ work to identify key parameters influencing production and create timely alarms and prediction of future events. Integration of predictions as well

as access to real-time decision support in a feedback loop to the producer generates high value in production (see Figure 1). With respect to obtaining a product that must live up to specific requirements, e.g. weight forecasting (to meet a target weight with a certain uniformity); identifying issues ahead of time, e.g. climate and feed/water issues (suboptimal/toxic levels or instability); and behavioral indicators, e.g. indication of animal wellbeing, disease and stress.

Issues in both the growing environment and how animals thrive are

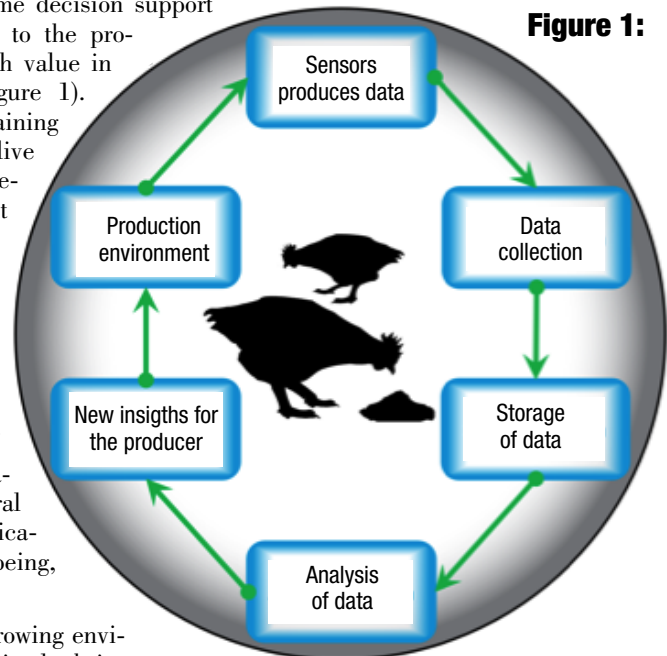
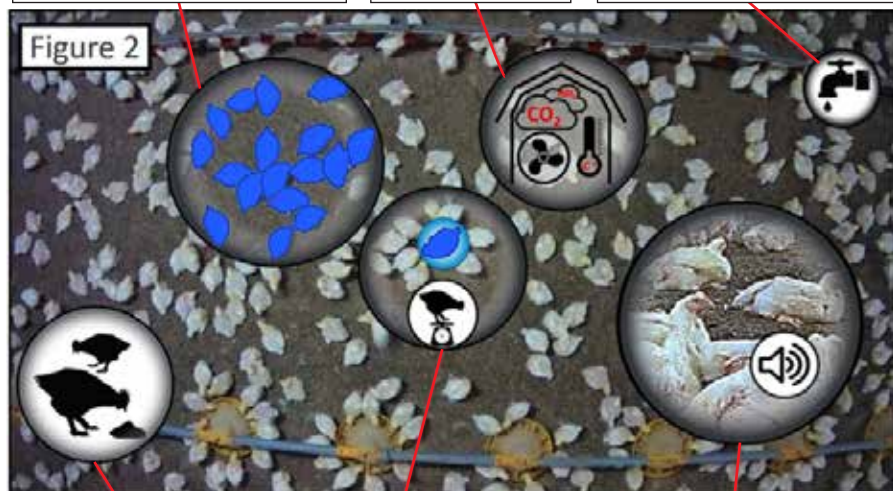


Figure 1:

**Camera technology:** Weighing, uniformity, growth and behavior

**House climate:** Trends and stability

**Water:** Consumption, growth and quality



**Feed:** Consumption and growth

**Bird weigher:** Weighing, animal size and growth

**Audio:** Behavior and welfare (disease, stress)

reflected in the animal behavior. Hence, looking at both climate data and behavior data from the birds, provide both direct and indirect information that can be utilized in analyses. Linking such information to actual slaughter data, enables us

to identify issues that has the highest value and influence on the final product.

Scio+ are creating novel solutions that visualize animal status and identify factors that influences both animal welfare and production. This is achieved by

taking enriched data sources into consideration, combining traditional statistics and machine learning techniques with image, video, and audio data as well as water quality data obtained from sensors installed at selected farms. These new solutions will provide farmers with valuable insights and support their deci-

sion making with regards to evaluation and improvement of their production (see examples in Figure 2).

Scio+ strive to develop and bring next-generation technology into the food production industry through a science driven approach. The goal is to deliver intelligent data-driven tools that will address

critical issues; consequently, increasing precision in achieving production goals and profit.

*Scio+ and Mikkel Boel will exhibit at VIV Asia from March 13-15, 2019 Bangkok, Thailand – booth H099.3560  
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