**Livestock Precision Farming**

**Automated Measurement System to Assess Animal Residual Consumption and Behavior**

**Development Requirements (testing, scale-up production, investment, etc.):**

We plan to add feed-weigh troughs in the future, with a view to obtaining the animal’s weight at the feeding trough, to enable the automated calculation of the feed conversion ratio, among other developments. This project is a joint undertaking with the Central Queensland University of Australia.

Additionally, farmers will be able to purchase the feed-weigh troughs through the adopter company, and subscribe to the “INTA Monitoring Network”, which will allow them to access an extended software version and compare their yields with other herds anonymously. To such end, connectivity improvements are required at EEA Anguil facility. We will assess whether it would be feasible to employ INTA servers, or otherwise, to contract an external server using the income obtained from farmers’ Network subscriptions.

**Working group:** EEA Anguil. Principal Investigators: Aníbal Pordomingo and Ricardo Garro.

**Statement of problem:**

One of the beef cattle farming practices in Argentina and the world is feedlot fattening. The cost of feed constitutes the core component in the cost equation and impacts business economic feasibility. In this regard, cattle selection has evolved to consider animal size and weight gain. However, this is insufficient and we need to know the individual feed conversion ratio, since great variability may exist among animals in connection with feed consumption efficiency. Determining the feed conversion ratio enables to reduce and optimize feed consumption for every animal, to render it a potential genetic selection feature that results in herd improvement.

Advanced. The functional prototype with eight intelligent feed-weigh troughs has been already installed at INTA Anguil and it feeds 43 bulls. It is fitted with open-source software enabling data display, developed by the technical staff.

Presently, we are working on the final draft agreement with Hook, the adopter company, who will manufacture and market the development.

**Technology Readiness Level:**

**Technology proposal:**

The development is an innovation based on the notion of “The Internet of Things” that enables to assess individual consumption and behavior of animals within a given herd. It is based on automation, development and optimization of intelligent feed troughs that monitor individual consumption and behavior of sheep and beef cattle. By delivering accurate information, the system enables the selection of individual animals with higher feed conversion ratio efficiency.

Every animal is tagged with an electronic ear chip. In turn, every feed-weigh trough features an antenna and a trough, placed on a scale; when an animal introduces its head through the gate, the antenna detects the ear tag and the animal ID and amount of feed consumed. At the end of the day, the system software reports the amount of feed that every animal consumed, as well as the time and the feed trough, among other data.

The weight of every animal is recorded regularly and this enables the weight conversion analysis to determine the feed conversion ratio for every animal, one of the genetic features transferred to offspring.

Other relevant information provided is the identity of dominant animals, dietary preferences and indications of disease when their consumption drops.

Precision Technologies.

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