INFORMATION NEEDS OF COW- CALF FARMERS

Supporting farmers in managing their
pasture and inventory

This research investigates the information needs of large-scale farmers to improve their resource and animal management practices, and explores how this information should be presented. The research aimed to deliver two key outcomes: 1) a description of information that farmers can use to improve their farm's performance, and 2) design guidelines for an information platform to present this information.

The methodology involved modeling target farms, worker roles and responsibilities, and compiling relevant key performance indicators. This was validated through discussions with several farmers from around the world. Several User Experience sources were compiled to develop relevant design guidelines. A digital mock-up applying these findings was created and evaluated qualitatively with an expert in farms in the target region and a small-scale hobby farmer.

Modeling farms

1. Farm-type classification: Farms were categorized based on factors such as scale, management integration, and role specialization. This showed that the larger the operation, the more specialized roles can become and the more management is separated from the daily operations of the farm; in small farms, though, roles become more integrated and managers stay close to the daily operations.

2. Role-based information flow: This model was based on the roles that exist on a farm and their responsibilities and showed how information moved and what other interactions there were between roles. This gave interesting insights into what information was needed per role to fulfill their responsibilities.

3. Hierarchical Key Performance Indicators: This model demonstrated how different metrics at a farm level were interrelated and how lower-level indicators contributed to higher-level measures of performance. It helped to find out which metrics are most important in the general performance of farms.

These models provided insight into the variety of the operations on farms and the interconnectivity of various pieces of information. Based on these models, and an understanding of the activities of a farm, it was possible to prescribe a list of information which would be useful to present to farmers.

Creating guidelines

Based on well-established User Experience principles it was possible to compile design guidelines to be used to present the information derived from the aforementioned in ways that allows users to appropriate and interact with the presented information well. A concept information platform was then made to evaluate the application of the guidelines and the relevance of the gathered information with feedback from users.

Evaluating information and guidelines

Testing of the mock-up was conducted through qualitative interviews with two participants: one expert, who knows the farming operations in the target region, and one farmer from another region. Interviews were structured according to a protocol aimed to generate rich qualitative data without leading participants:

1. Think-aloud protocol: Participants were asked to go through the mock-up, instructing them to verbalize what was going through their minds, their reactions, and problems encountered. It was employed to get insight into what participants were thinking while going through the interface and information display.

2. Open-ended questions: Follow-up questions were formulated to be non-leading and open-ended. This would prompt participants to expand on their thoughts and experiences.

3. Scenario-based tasks: One of the participants was given specific scenarios and asked to navigate to relevant information within the platform. This method was employed to validate whether views expressed by the participant were reflected in behavior as depicted during the simulation of real situations.

This method of interviewing made it possible to delve into the extent to which the presented information and interface fitted farmers' mental models and decision-making process.

Results

The evaluation process resulted in some important findings regarding the presentation and relevance of farm management information. Participants indicated that they strongly prefer when farm data is visualized in ways that closely relate to their mental models of their farm. The need for customizable data views and the value of year-over-year comparisons for key metrics were also highlighted.

The evaluation was used to formulate several additional design guidelines to emphasize flexibility, user control, and context-rich presentation of information on the platform. These guidelines recognize that while data-driven insights are valuable, they should supplement rather than replace existing expertise and experimentation.

Conclusions and recommendations

The evaluation was carried out using a small sample size, and the analysis of farms lacked on-site observations. Future work should involve more field research, develop and test a more functional prototype based on the findings, and expanding user testing with a larger, more representative sample of target users.

This research lays the groundwork for more effective information systems in livestock farming operations, potentially leading to improved performance. As the agricultural sector continues to embrace technological solutions, studies like this play a crucial role in ensuring that these tools are designed with the end-user's needs and preferences at the forefront.