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Phase IIB

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Phase IIb – Project Proposal and Specifications

Problem Overview:

An in-depth understanding of growth trajectories, health trends, and resources among different birth cohorts is necessary for sustainable goat farming. The inability to visually represent the growth curves of goats and classify them according to birth cohorts makes it more difficult for Silvies Valley Ranch to recognize and effectively solve sustainability challenges. The implementation of a database system that allows users to organize goats by birth cohort enables the viewing and comparison of growth curves over time, allowing Silvies Valley Ranch to maximize future resource efficiency, improve health management, and boost overall cohort well-being. With the help of this solution, Silvies Valley Ranch can improve breeding programs because our application allows them to make data-driven decisions and carry out focused practices, all of which will contribute to the development of a stronger and more sustainable goat farming business.

Data Needed:

<u>Birth Weights(BWT)</u>

- Birth weights provide a starting point for each goat's growth trajectory.

<u>Birth Weight Date</u>

- This allows us to identify what birth cohort each goat is in

<u>Live Weights</u>

- Live weights allow for tracking of their growth over time.

<u>Weigh Date</u>

- Helps calculate each growth curve by helping us fill out the x-axis which is time

<u>GoatID</u>

- A unique ID for each goat that allows for individual analysis for a specific goat.

How the data identifies sustainability problems:

Comparing the growth curves of birth cohorts at Silvies Valley Ranch is a useful way to learn more about how seasonality affects the general health and growth of the goat cohort. Through analysis of birth weights within individual cohorts, the ranch is able to identify patterns that could be impacted by seasonal changes in climate, diet, and management techniques. With the use of a comparative method, potential problems relating to particular seasons can be identified, including differences in the quality of the feed, stresses related to the climate, and affects from the breeding season. Silvies Valley Ranch can use this data to put specific plans in place for issues related to seasonality.

The growth curve analysis becomes an important tool for assessing the effects of any management methods, dietary changes, or health practices that the ranch has applied selectively to one cohort over another. For example, comparing the growth curve of a birth cohort that was given a targeted nutritional supplementation during a difficult season with cohorts that did not get such intervention offers a straightforward way to show the practice's success. By using this method, Silvies Valley Ranch may identify effective tactics and possibly apply them to future cohorts, encouraging a more

data-driven and flexible response to seasonal difficulties. Therefore, the comparative study of growth curves is an effective method for evaluating the results of different approaches and improving cohort management techniques for increased sustainability.

Use Cases:

Adding a goat to the database:

1. Actor inputs GoatID.

2. The system validates imputed GoatID.

   2.a. The verification is invalid.

      1. The system tells the actor the GoatID is invalid

      2. Use case 1.

3. The system prompts for Birth Weight and Birth Weight Date.

4. The actor inputs Birth Weight and Birth Weight.

5. The system validates Birth Weight and Birth Weight.

   5.a. The verification is invalid.

      1. The system tells the actor the Birth Weight or Birth Weight is invalid.

      2. Use case 3

6. The system prompts for Live Weight and Weight Date.

7. Actor inputs Live Weight and Weight Date.

8. The system validates the Live Weight and Weight Date.

   8.a. The verification is invalid.

      1. The system tells the actor the Live Weight or Weight Date is invalid.

      2. Use case 6

Compare growth curves of different cohorts:

1. Actor selects specific time frame for filter

2. The system accesses all goat ids based on birthdate to assemble cohort

3. The system calculates the growth curve for each cohort based on the live weights and weight dates.

4. The system displays the growth curves of the selected cohorts on a graph for visual comparison.

5. Actor analyzes the growth curves to identify trends and patterns among the cohorts.

6. Actor selects specific cohorts/filters for further analysis based on the growth curve comparison.

    a. Actor can specify system to display predictive growth modeling setting

    b. System displays predictive growth modeling setting for goat weights