Group 15

Professor DeGood

CSC 315-02

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Project Proposal and Specifications

1. **What data the group will gather for incorporation into their database.**

We will be needing the birth weight data for every goat that has been on the ranch for a fair comparison. We will also be needing the goat's birthday to be able to compare the data for every year. Another piece of data we will be using for our database is every goat's gender to allow the database to make a separate graph for female and male goats. The database will be making separate graphs for females and males as a way to see if there are any trend differences or similarities between the male and female goats. We will also be needing the vigor score of the goats. We will need the vigor score for our personal research topic. Our personal research topic is trying to find a correlation between the vigor scores and weight gain of the goats. We would like to see if the vigor score can impact how fast the goats gain weight. We would also like to see if it can impact the weight itself. We are going to see if the vigor score has a correlation with if they are sold, and have healthy kids. We are also gonna see if In terms of the death rates data, we would be needing the data of whether they died prematurely and when they did.

2. **What questions they will explore with the data.**

The questions that can be explored with the data is which traits and stats have a significant association with vigor. Whether that's death rates, weight gain, growth rate, healthy births, and whether they are likely to be sold or not. Some or maybe all of these may have no significant association with vigor but in the case they do they'll know. This can let them see whether or not a kid with higher/lower vigor will be less or more likely affected in certain areas. With the growth weight curve they can ask whether a kid is growing at the right pace and if not figure out why that is. Looking through the kid's traits and seeing if something in the database shows this cause. If not then they can do a physical check on the kid. So if a question like "Is goat '1234' gaining weight"? A value will show the goat's weight curve and compare it to the average weight curve. If vigor scores show association with other traits then any question about vigor will show what the goat's vigor score shows. Whether that's likeliness to be sold, death rate, likeliness to give healthy kids, or its average weight gain.

3. **How the data could help them identify sustainability problems, and opportunities to propose positive change.**

It is fairly well known now that goats have been proven to be more sustainable than other livestock, especially compared to cows. They require less water and less land. Additionally, they can just be left to graze, so farmers don't need to worry about feeding them very often. Goats have also been used to clear invasive species of plants such as kudzu in the southern United States. The data that we are using for our projects

includes average weight gain. This can be used to estimate how much food the goats are eating. The “hungriest” goats can be picked out to be used for clearing overgrown areas. Goats have also been used to stop wildfires in advance in California. They can create a buffer without any plant life so the fire doesn’t have any fuel to burn. Humans already do this. Outsourcing it to goats lets humans do more to fight wildfires and stops them quicker.

The main sustainability drawback with goats is that they produce more methane than even cows, on average. It is hard to control how much methane a goat produces, but with the data we have, we know how many goats are on the farm, so we can at least keep a rough estimate. A study done in 2021 calculated that goats produce roughly 3.8 - 5.5 kg of methane for every kilogram the goat weighs. Since we also have the data for how much each goat weighs, a rough calculation can be made. It is important to keep things like methane output in mind since greenhouse gas emissions have such a big impact on the environment.

Works Cited

Curtis, Paige. “Is Eating Goat Meat Green?” Sierra, Sierra Club, 29 Sept. 2022, www.sierraclub.org/sierra/eating-goat-meat-green.

4. **An overview of the sustainability issue you will be exploring, offering background on the problem, why it persists, the various stakeholders affected by the problem, and ethical issues presented by the problem.**

The sustainability issue we will be exploring is wildfires. Wildfires are started mostly by humans. Any small spark or heat source can start a deadly long lasting fire. The rest of the time it is started naturally like through lightning bolts. The reason the fires last so long is because of the weather causing plantlife to become dry and brittle. Having constant dry weather makes it easier for the fire to spread and help the fuel around it easily ignite. While wildfires have been around for a long time; the increasing heat of global warming only makes it occur more frequently. Silvies Valley Ranch is already well aware of this problem as their use of goats is partially for this reason. As stated in the previous question, goats are used to clear out this unsuitable and dry vegetation. The only problem is their higher methane output (compared to cows).

5. **Choose two representative user interactions with your completed project. Write a detailed textual use case for each.**

Use Case 1: Compare average birth weights

Steps:

1. System prompts user to enter a year. User can input 2 years at a time.
2. System verifies that the database has both years on record.
3. System prompts the user to see what statistic (mean, median) the user wants information for.
4. System outputs the values for each year.

Use Case 2: Correlation between the vigor score and significant associative traits

Steps:

1. System prompts user to enter a vigor score
2. System checks to see if the database has information regarding the vigor score entered
3. Ask the user which traits they would like to know about
4. Return a graph of the trait the user entered