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Project Proposal and Specifications

Goats have proved to be a viable addition to the ecosystem and our food palates. Their diet consists of hay, grass, weeds, etc. Compared to cows, the goats are less work since they would be able to consume anything on the fields. Additionally, compared to cow meat, goat meat is a healthier alternative. One ranch that is raising a herd of goats is the Retreat at Silvies Valley Ranch. To aid the ranch in their work, the following will provide a detailed description on the program used to calculate the growth curve for the entire herd at any given time and determine if the length between the date of birth and vaccination date have an impact on the goats' growth rates and ages when sold.

To calculate and answer both research questions, there will be various data collected. The following information is necessary to answer the topics provided: birth date and weight, vaccination dates and weights, sales date and weight and the weight of any given goat at any given time. From the data, we would be able to derive the growth rate of the entire herd at any specific time given the data of each goat. Understanding the growth rate of the herd would give the rancher useful insight into how well the herd is growing and see any possible benefits of selling the goats at a certain point in their lifespan. It is especially beneficial to know the growth rate at any given time to catch any dips and any hazards or harm that are causing the decline of the herd's growth. Additionally, we would be able to compare the survival and growth of a goat

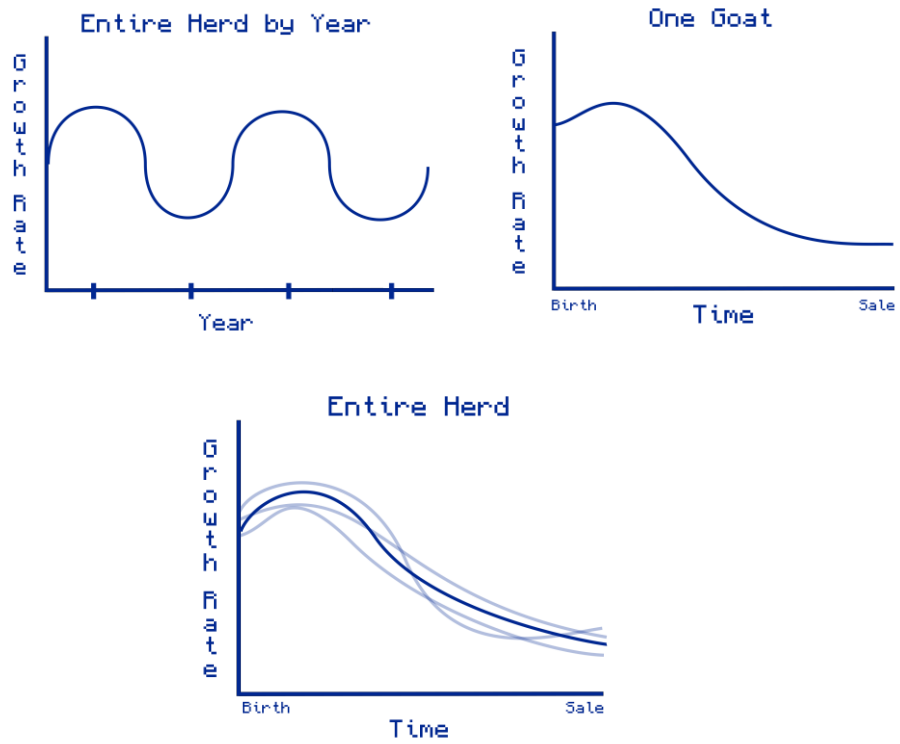
based on how long it took to get their vaccines since birth. In the long term, the rancher would be able to know when the best times are to vaccinate their yearlings to maximize their growth and health; it would provide the ranchers with the ability to monitor if any periods exist where the yearlings are especially vulnerable and less likely to survive if vaccinated a certain time after birth.

The sustainability issue that we will be exploring involves the irreparable harm that catastrophic wildfires can do to the ecosystem because of an environment created by brushy forage. Because of its nature, brushy forage can proliferate until all the grasses and other trees around it get pushed out of the way and degrades the watershed, leading to increased chances of wildfires occurring. As a result, rangelands, forests, farms, and other agricultural areas and regions can be severely affected by this issue in terms of destroyed habitats for animals and crops for harvesting. In addition, since wildfire smoke contains a mixture of various hazardous air pollutants, this contaminates the air and impacts the climate by releasing large amounts of carbon dioxide and other greenhouse gases into the atmosphere, impacting climate change. In response to this issue, the Silvies Valley Ranch has been developing a breed of American Range Goats that are able to economically harvest the brushy forage, decreasing the rates at which wildfires occur in the environment.

The end goal of this program will allow users to interact with and retrieve valuable information on the correlation between goat vaccinations and growth rates. The user will be allowed to access to the several vaccines used on the goats and see their effects. After being prompted to select which vaccines they would like to view, the user will then have the option of viewing the effects of said vaccine for the entire herd or a single goat. If the user selects the

entire herd, they can choose to view all goats' lifespans at once (i.e., the goats' date of birth aligned), or to view the entire herd's growth rates chronologically. The user chooses to view by lifespan. Our program will calculate the goat's average daily gain and create a graph that displays the ADG over their lives, along with a marker to indicate when the goat was vaccinated with that particular vaccine. We would also display sales or deaths of goats on this graph.

Another potential user interaction would be that after selecting the desired vaccines and to view the entire herd, the user decided to view the herd chronologically. The user would then be prompted to enter a date range. Our program would calculate an average growth curve for the entire herd over this period using the ADG, also displaying markers for when goats were vaccinated. This would help the rancher observe any trends in the data and see if any ill effects are going unnoticed due to the timing of the vaccines.



Here are some examples of potential graphs our program would be able to generate. With this information, the ranchers at Silvies Valley would have valuable insight into the health of the herds and be able to make decisions on whether to change any aspects of their cultivation process. It would aid them greatly in potential minimizing health problems and time to reach sale weight, and maintaining the health quality of their goats.