

CALIFORNIA STATE SCIENCE FAIR 2002 PROJECT SUMMARY

Name(s)

Melissa L. Morrison

Project Number

22242

Project Title

How Can Genetics Stamp Out Scrapie?

Abstract

Objectives/Goals

The purpose of this project is to see if we can genetically eliminate scrapie from the United States within ten years by knowing the DNA of your sheep flock.

Methods/Materials

First we drew 2cc of blood from my 5 ewes. We then packaged up the blood and tent it to Gene Check in Fort Collins, Colorado. After they tested the blood, they sent us the results. We then identified which sheep and their offspring were resistant to scrapie and which could possibly not be resistant. 5. The offspring that were identified as possibly not being resistant will be tested should we consider keeping them for breeding stock.

5 ewes; 1 syringe for each ewe; 1 blood tube for each ewe; 1 blood sample from each of the ewes- 2cc; testing equipment from Gene Check in Fort Collins, Quorado.

Results

Our ram, Wattonville 15, is genetically resistant from scrapie being RR. All of his offspring will be resistant to scrapie, either being RR or QR depending on the ewo. All of our ewes are also resistant to scrapie but are QR, and can possibly pass on the non-resistant gene if bred to a QR ram. This year we bred three ewes, Dolly, 614 and Roxanne, to Wattonville 15. All of his offspring will not have to be tested to insure that they are resistant to scrapie. From our junnett square, we know that all of their offspring are either RR or QR, both being resistant to scrapie. Two ewes were bred to a ram, Kryptonite, which is believed to be QR. Since our ewes are also QR, our punnett square shows us that we have 25% chance of being QQ, 50% chance of being QR and 25% chance of being RR.

Conclusions/Discussion

Based on our test, combined with a monitored breeding program, we can eradicate scrapie genetically. In selecting breeding animals, both rams and ewes, we will first locate sheep that are resistant to scrapie. Our first choice in rams will be an RR ram. This would guarantee all of his offspring are resistant. If th€ ram is a good ram but is QR, then we will test all of his offspring that we are considering keeping for breeding purposes. Should that offspring be QQ, we will not keep it for breeding no matter what the quality of the offspring. Over the next ten years, we will gradually only keep breeding animals that are RR genetically. In conclusion, if everyone followed this breeding program, we would be able to eradicate scrapie from the United States.

Summary Statement

My project is to determine if we can eradicate scrapie from the United States by knowing only the genetics of your sheep flock.

Help Received

My mom helped me paste papers to my project board. My dad drew the blood from my five ewes under the instruction of our veterinian, Dr.Colburn. Gene Check tested the blood from my sheep. Dr. Colburn provided me with the syringes and blood tubes.