



# CALIFORNIA SCIENCE & ENGINEERING FAIR

## 2019 PROJECT SUMMARY

Name(s) <b>Dalton Robinson</b>	Project Number <b>S1221</b>
Project Title <b>Parasite Susceptibility in Icelandic Sheep: A Comparison of Offspring of Iceland-born Rams vs. American-born Rams</b>	
<b>Abstract</b> Society's preference for organic, naturally-raised, grass-fed meat, wool and cheese products requires that ruminant animals be humanely raised, which includes continuous access to grazing. This management system results in an increased exposure to parasitic worms present on pasture grasses, the most significant, due to its pathogenicity, is the roundworm, <i>Haemonchus contortus</i> . <i>Haemonchus contortus</i> is a lethal and common internal parasite of sheep that feeds on blood, leads to anemia and if untreated, results in the death of the sheep.	
<b>Methods</b> This project investigates the susceptibility to <i>Haemonchus</i> infection in two genetically distinct groups of lambs on a Mendocino County ranch using a quantitative measure of fecal egg counts. All lambs in this study are purebred Icelandic Sheep, either sired by an American-born ram (lambs conceived by natural mating), or sired by an Iceland-born ram (lambs conceived with the use of frozen imported semen.) It has long been suspected, but remains unknown, that offspring of rams born in Iceland may have a greater susceptibility to <i>Haemonchus</i> infection, because the parasite doesn't occur in Iceland, therefore there has been no selection pressure for <i>Haemonchus</i> parasite resistance. In the United States, <i>Haemonchus</i> is the most significant parasite of sheep and almost all American-born sheep are exposed to this parasite throughout their lives.	
<b>Results</b> Results of this study demonstrate that lambs sired by an Iceland-born ram suffered more ill effects of <i>Haemonchus contortus</i> and required more deworming to prevent illness and death. The FEC (fecal egg counts) of the lambs sired by an Iceland-born ram were lower than the FEC of the lambs with an American-born sire, indicating that the lambs sired by an Iceland-born ram were more susceptible to the ill effects of the parasite, even at a lower parasite loads.	
<b>Conclusions</b> Based on the data from this study, sheep breeders may need to change the way they monitor their sheep for parasites if they introduce direct descendants of Iceland-born rams into their flocks. Early detection and intervention can save the life of a parasitized lamb and help prevent other illnesses such as pneumonia that can occur when lambs are weakened by anemia caused by the <i>Haemonchus</i> parasite.	
<b>Summary Statement</b> Sheep breeders may need to change the way they monitor their flock for parasites if they introduce direct descendants of Iceland-born rams into their flocks.	
<b>Help Received</b> I collected fecal pellet samples and performed all FECs (fecal egg counts) after researching the test procedure on the internet. After recording all FECs, I received deworming records from the veterinarian and I correlated the deworming results with the FECs.	