



**CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY**

Name(s) <p align="center">Grace H. Jardon</p>	Project Number <p align="right">38082</p>
Project Title <p align="center">Epidemiology and Treatment of Spinose Ear Ticks on a California Dairy</p>	
<p align="center">Abstract</p> <p>Objectives/Goals The objective of these studies is to determine potential control methods for spinose ear ticks on dairies. The studies include observations on when the animals become infested, where the adult ticks live, and in vitro and in vivo analysis of treatment options.</p> <p>Methods/Materials Four separate experiments were conducted: 1) Nymph stage ticks harvested from the ears of cows were subjected to one of three treatments (Control, Mineral Oil, and CyLence Ultra ear tag piece). The ticks were observed periodically and recorded as dead or alive. 2) In order to determine where adult ticks are living (and thus laying eggs and supplying the next generation of ticks), one-liter bedding samples from four locations in 30 freestalls were sifted through a 4.75 mm screen. 3) In order to describe the pattern of infestation, primiparous animals in the fresh pen were examined for ticks. 4) Ear tags were inserted in the ears of fifty primiparous animals before calving. Cows were examined at 28-54 days after calving.</p> <p>Results 1) All oil treated ticks, 74% of ear tag treated ticks, and 8% of control ticks were dead by 24 hours. The ear tag treatment incapacitated the ticks immediately. 2) Adult ticks were found in 20% of the samples in the undisturbed area in the front of the stall. No ticks were found in the other three freestall areas. 3) Only 8% of the animals had ticks in the first week of lactation. By the third week 96% of the animals had ticks. Animals on this dairy freshen with no ticks but by several weeks are close to 100% infested. This information implies that the reservoir for adults/eggs/larvae is in the freestalls. 4) The treated cows had no ticks and 25% of the control cows had ticks.</p> <p>Conclusions/Discussion The contribution of this study is threefold. First, approved ear tags and mineral oil are effective treatments for the infested cows. Second, by identifying the location of the adult ticks, a more effective system for disrupting the tick lifecycle can be implemented through raking and freestall modification. Third, Efforts to control the ticks can be concentrated in the milking herd as the animals become infested after calving.</p>	
<p>Summary Statement</p> <p>I determined the reservoir of adult spinose ear ticks is in the undisturbed bedding in the front of the stalls, animals calve without ticks and become infested within 3 weeks, and CyLence Ultra ear tags are an effective method of control.</p>	
<p>Help Received</p> <p>Dairyman: Animals and help. David Kattes (Tarleton SU) and Alec Gerry (UC Riverside): Helped understanding ticks. Mike Overton (Elanco): Statistics. Rick Peyton (Valley Vets): Introduced issue. Phillip Jardon (Elanco): Equipment and guidance. Brett Davis (Bayer): Ear tags.</p>	