

## **Beef Cattle Health and Management 2009**

**Project:** 807 Assessing factors influencing the relationship between face flies (*Musca autumnalis* DeGeer) and *Paraiotonchium autumnale* (Nickle).

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**Objective:** *Paraiotonchium autumnale* (TYLENCHIDA:SPHAERULARIIDAE) are nematode parasites of *M. autumnalis* (DIPTERA:MUSCIDAE) that occur naturally in cattle pastures in Northern California. The parasites are not uncommon, but seem to have little effect on fly population densities. Understanding how infected and healthy flies are distributed in the field can aid in evaluating the impact of *P. autumnale*. If infection by *P. autumnale* reduces flight performance of *M. autumnalis* in fields, then we would expect parasitized flies to be more patchily distributed than healthy flies. We hypothesize parasitism by *P. autumnale* will negatively affect *M. autumnalis* flight performance, and this cost can affect spatial distribution of infected and healthy flies. Preliminary flight tests measured wing beat frequency and flight duration of infected and healthy flies. Because we cannot determine infection status by observation, flies were dissected upon death and nematode infection was assessed. Field studies were conducted in Davis, CA and Browns Valley, CA to compare the spatial pattern of parasitized versus healthy flies from dung pats. A handheld Global Positioning System marked the location of collection points as dung pats were collected in transects. Pupae from these pats were individually reared to adulthood. In this work, we ask, essentially, whether this parasite is spatially self-limiting.

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**Project:** 809 Integrating DNA information into Beef Cattle Production Systems Integrated Grant

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**Objective:** A large investment has been made in developing DNA-based tools for the beef cattle industry. Although DNA markers provide an opportunity for increased genetic gain and provide new management opportunities, their use does not provide a guaranteed return on investment. The overall objective of this project is to evaluate different DNA-enabled approaches for achieving genetic improvement on commercial beef ranches. The research objective will be to compare the current means of genetic prediction, which is the use of breed-based Expected Progeny Differences (bEPDs), with whole-genome scan genetic predictions (molecular breeding values, MBVs), and “commercial ranch” genetic evaluations (rEPDs) of herd bulls based on the performance of their offspring under field conditions. The costs and benefits associated with the application of these different DNA-based technologies on commercial beef operations

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***Project:* 809 Integrating DNA information into Beef Cattle Production Systems Integrated Grant - Continued**

will be analyzed. The extension objectives of this project will be twofold. The first objective will be an intensive educational program for the ranch cooperators participating on this project. This will include the interpretation of the new DNA-enabled information developed during this project and measurement of any responsive changes that occur in their management and genetic programs during the course of the four year project. The second objective will be to develop and deliver educational materials to a national audience on the integration of DNA information into beef cattle selection programs.