PROJECT:

"Relationship between milk composition, metabolic profile, welfare status, and body condition score in dairy donkeys"

Prepared for: CNR Short Mobility Program 2014
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During my experience working with both colleagues (Dr. Cavallarin and Dr. Valle) and veterinary students from the Veterinary Science Department at the University of Turin, we have been actively involved in surveying dairy donkey farms. I arrived on May 28th and we surveyed our first farm together on the 30th. We will continue to work together on the study during my stay in Italy through June 26th. Once returning back to the US, I will continue to help and be available for consulting on data analysis as well as assist in preparing the findings to be shared with the scientific community via journal articles and or presentations at professional meetings.

Currently we have collected data from three different farms, Farm 1 in Langhe on May 30th, Farm 2 in Saluzzo on June 5th, and Farm 3 in Pamparato on June 10th and a fourth farm in Torro Canavese, will be surveyed on the 17th. Data has been collected that's related to four major research objectives for this study focused on dairy asses:

I. Relationship of metabolic status and milk composition
II. Correlation of Body Condition Score (BCS) to specific blood chemistry & hematocrit parameters
III. Explanation of BCS and variability in milk composition
IV. Monitor welfare status in dairy asses by evaluating animal based parameters

The following samples, scores and measurements have been collected or made at each dairy from lactating jennies (female donkeys); a single intravenous blood sample for blood chemistry and hematocrit analysis, assigned body condition scores, neck crest scores, anatomical measurements of the donkey's point of shoulder to point of hip length, body depth, neck width, crest width, neck length, poll to withers length, along with obtaining a milk sample for composition analysis. Each donkey was also examined for any abnormalities or appearances such as hoof or dental conditions or the presences of external parasites such as lice. Each farmer was also asked to body condition score each animal and then interviewed following the collection of all samples. The interview questions focused primarily on the care and management of the farmer's donkeys.

In general, we have noticed a difference in management and production schemes among dairies. The first donkey dairy allowed their donkeys to graze in the woods and all appeared to be in poor body condition with a heavy internal and external parasite infestation. Round worms were noticed in the manure and lice were seen on most of the jennies. The second farm hosted a group of very well fed donkeys that showed no signs of external or internal parasites. Most of the donkeys at this farm were on a scale of 1 to 5 in body condition scoring with 1 being emaciated and 5 being obese, were 3 to 4 in BCS. There were many donkeys with neck crest scores of 4 and 5 where the previous farm donkeys scored 1 to 2 on neck crest and commonly 2 for BCS. The donkeys at Farm 2 also produced a great deal of milk. The largest problem seen at this farm were some donkeys that needed their hooves trimmed.

The third farm we visited had over 120 head of purebred Ragusana donkeys including two jacks (stallions). The donkeys had been purchased in Sicily for approximately 2,000 euros each (according to one manager) and shipped eight hours on a boat and then 24 hours by van to the farm nestled deep in the mountains. The donkeys and a man in charge of milking the donkeys who knew each jenny (mare/female donkey) by name arrived in November. The donkeys were much larger and more uniformed than any of the other donkeys that had been tested.

Overall, the donkeys appeared to be in a general body condition score of 2 to 3 and ideally could be fatter. However, all of the donkeys were very calm and showed no signs of stress. They proved to be easy to handle and take samples from including blood, milk and measurements. Their hooves and teeth were in good shape and most had foals on their side. The major health and welfare concern noted at this farm, without further analysis of the blood and milk composition, was a heavy infestation of lice. The donkeys had been kept in the barn all winter and were just now being turned out to graze in the forest. One of the managers also spoke of difficulty in finding a good source of hay to feed the donkeys. The donkeys were currently consuming grass hay and concentrates. Once, the lice have been controlled, it's very likely the producers will see a positive change in body condition score. Donkeys are quite prone to having lice and this often lowers their overall body condition score but can easily be removed. Visiting this farm was very unique opportunity to work with such a large and uniformed herd of purebred animals with managers that were very interested in the study and helping improve all overall production and welfare of their donkeys.

The next steps in this project will include collecting the remaining data from dairy four on the 17th of June and then a comprehensive review of the data will take place beginning the 19th to try and make any correlations in milk production, BCS, blood chemistry and hematocrit data as well as other body measurements such as neck crest score that were taken during the study. In addition to collecting data for this study, I have also had the opportunity to assist a French intern from an Agrarian college who is working closely with Dr. Valle and Cavallarin on an extensive review of donkey nutrition, behavior, milk production and composition for publication for the scientific community to help serve as the first ever guide for nutritional needs for dairy donkeys.

Lastly, I would like to thank the CNR Short Term Mobility Program for this opportunity and hope that in the future I can host Dr. Cavallarin and Valle and/or their students in the US to learn more about donkeys as well as continue to collaborate on donkey research.

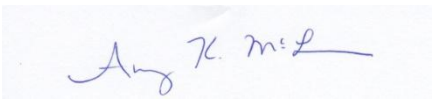

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Figure 1. Dairy Farm 1 notable low BCS and heavy internal and external parasite infestations..

Figure 2. Dairy Farm 2 taking neck measurements. This farm showed much higher donkey neck crest and body condition scores.

Figure 3. Farm 3 home to 120 purebred Ragusana donkeys very calm and stress free herd to work with but notable lice infestation.

Figure 4. Research team from left to right: Dr. Emanuela Valle (Veterinary Science Program, University of Turin), Fredericka Raspa (veterinarian student, collecting data for project), Dr. Amy McLean (Animal Science, North Carolina State University), Dr.Raffealla Barbero (Istituto Zooprofilattico Sperimentale), Laure Verdon (French intern) and Dr. Laura Cavallarin (ISPA CNR).