Afghanistan PEACE Project Introduces Technology to Assess Dietary Composition for Free-Ranging Livestock

One of the components of the Afghanistan PEACE project is to introduce a technology, known as Near Infrared Spectrometry (NIRS) technology, which allows for the rapid assessment of nutritional quality of rangeland vegetation in Afghanistan. The benefit of using NIRS technology is that software associated with it enables predictions of percent crude protein and digestible organic matter in forages consumed by grazers using Afghanistan’s rangelands, at a significantly lower cost than using traditional methods would. This nutritional information is essential for the proper use and management of Afghanistan’s rangelands, and to better understand how to improve livestock production. The PEACE project is currently working with the Ministry of Agriculture, Irrigation and Livestock (MAIL) Department of Animal Health and Production (AHP) to implement the use of this technology and its associated software.

NIRS technology works by exposing fecal samples to wavelengths of light in the near infrared light spectrum. Absorption is then recorded into what is commonly referred to as a spectral profile. The composite of spectral profiles are then statistically analyzed in combination with chemical results from the analysis of diets administered during a controlled feeding trial, to derive a predictive equation. To fully understand how the method works requires a strong statistical background. On the other hand, learning how to scan samples and obtain and interpret results using the associated software is actually quite easy. Some other advantages of using NIRS technology for assessing dietary composition are that it is more reliable and faster than traditional methods, such as chemical analyses.

Prior to nutritional profiling, diet:fecal pair studies are required for the different ruminants used by herders in Afghanistan. To date, 3 feeding trials have been completed. Two were with Karakal and Turkhi sheep and one with a mixed goat breed common to Kuchi herds. Two of the trials were conducted at the MAIL Central Veterinary Institute facility at Daruleman, and one at the Kabul University Department of Animal Sciences Animal Research Facility. Currently, one MAIL Department of Animal Health and Production staff member is assigned to the NIRS component of the PEACE project. The MAIL Department of Animal Health and Production has also agreed to install this technology in a nutritional laboratory that is scheduled for completion in the spring of 2009. Once complete, this lab is expected to be able to perform both chemical and near infrared analyses for a variety of applications related to nutritional profiling.
Training in the uses and applications of NIRS technology took place in October 2008 during a 3-day workshop. The intention of the training was for a NIRS expert from Texas A&M University to introduce this technology to organizations involved in improving Afghanistan's livestock economy, including the health, extension, nutrition, and production sectors.

The participants represented members of the Kabul University Departments of Veterinary Science and Agriculture, the Dutch Committee for Afghanistan (DCA), Agha Khan Foundation, Emergency Horticulture and Livestock Project (HLP), Mercy Corps, the EU Animal Health Development Program, and the MAIL-Department of Animal Health and Production. During the training, participants learned of the everyday application of this technology in both the human and livestock sector.

Opportunities here in Afghanistan specific to the livestock sector were also reviewed in addition to its use in nutritional profiling. These included its potential for cashmere grading, dairy (e.g. milk, cheese, yogurt) quality control, forage analyses, feed supplement analyses and development. Currently, the PEACE Project has one NIRS in the country and this will be based at the MAIL-AHP Nutrition Lab at the Central Veterinary Institute.