LA-UR 12-20405

Licensable Technologies

Preservation of Sheep Genetic Resources

Applications:

- Animal husbandry (improved breeding techniques)

Benefits:

- Define genetic nature of the breeds of sheep in indigenous environment
- Identify opportunities for protection and preservation of local indigenous breeds
- Develop genomic database for future selection of rare breeds for further research and commercial use

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Summary:

Preservation and rational use of genetic resources of farm animals is an issue of global concern. It is important to not only actively research and preserve the cultured animal species, such as sheep, but also to study indigenous species and breeds evolved on the basis of natural selection. Sheep husbandry is one of the traditional branches of animal husbandry in Kyrgyzstan. The local sheep with high degree of adaptability to the environment have been bred on the Kyrgyz territory for centuries.

The work proposed to be completed by LANL and the Kyrgyzstan Institute of Biotechnology will provide a basis for defining genetic nature of the breeds of sheep in Kyrgyzstan, and will identify opportunities for protection and preservation of local indigenous breeds. The proposed project tasks are the following:

- Identify regions of rare sheep breeds in Kyrgyzstan; select and establish groups of sheep for research
- Conduct morphological and immunological research of animal blood to define marker systems
- Identify indigenous breeds on the basis of DNA technologies in order to find similarities and differences between select species in the region
- Employ cryopreservation methodologies for the collection of gametes and embryos to establish cryo-banks
- Create a digital database of sheep gene pool of the Kyrgyz Republic

Studies of genetic structure of valuable species that are disappearing and of sheep flocks that have been bred in extreme conditions of mountainous ecosystems of Tien-Shan region require the use of morphological methodologies to identify pheno-genotypes of animals. This research should also employ a number of biochemical and immunological techniques, as well as marker-testing and computer modeling for the characterization of collected data.

Remarkable adaptability of some of the indigenous sheep breeds served as a basis for producing cultured breeds on the territory of Kyrgyzstan. These breeds are resistant to a number of infectious and invasive diseases. The use of local breeds in newly established small farming communities has proven extremely useful.

The ultimate goal of this project is to develop the Genome Database for future selection of rare breeds for further research and commercial use.

LANL is currently seeking a commercialization partner to help develop this project.

Development Stage:

LANL and Institute of Biotechnology in Kyrgyzstan are at the initial stages of proposal development.

Patent Status:

No patents have been filed yet for the new work proposed under this project.

Licensing Status:

LANL is currently seeking a commercialization partner to help develop this project. Available for licensing once project is developed.

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04/12