

Collaboration Brings Colonial Sheep Collection to Colorado

What do the Agricultural Research Service (ARS), George Washington's Mount Vernon home, and Colonial Williamsburg, Virginia, have in common? Here's a hint: The answer has four legs and a woolly tail.

Both the Mount Vernon Ladies' Association, which operates Washington's estate, and the Colonial Williamsburg Foundation, which operates Colonial Williamsburg, maintain flocks of heirloom sheep. The rare and unique genetic traits of these sheep are being preserved by ARS scientists with the National Animal Germplasm Program (NAGP) in Fort Collins, Colorado.

Sheep have lived in the United States since colonial times, but most of the breeds that thrived in those days have been replaced by others that are better suited to modern production. Descendants from a few of those colonial flocks have survived, however, and NAGP has singled out two rare breeds—Hog Island and Leicester Longwool—for genetic preservation.

NAGP facilities house genetic materials—or germplasm—for sheep, cattle, chickens, pigs, aquatic animal species, and other livestock. The animal collection contains more than 516,000 samples, many donated by livestock producers throughout the United States.

“A lot of livestock genetic resources are privately owned, yet their preservation is a public good,” says NAGP geneticist Harvey Blackburn. “To conserve these materials, collaboration and interaction with the owner is key.”

The collaboration on sheep genetic resources began in 2006, when Blackburn and his colleagues decided to expand the NAGP sheep germplasm collection to include more rare breeds. They contacted producers and hobbyists around the country and collected blood samples from 700 sheep representing 28 breeds, both commercial and rare.

The scientists analyzed those samples and found that several of the rare breeds were genetically distinct, including Hog Island and Leicester Longwool. This means they have unique genetic traits that could be useful for researchers and breeders.

Both Hog Island and Leicester Longwool sheep descended from breeds raised during the colonial era, before the advent of modern breeding techniques. They are smaller than modern breeds, with less meat and coarser wool—but they have characteristics that newer breeds may lack. For example, the Hog Island sheep, which survived for years on an uninhabited island off the Virginia coast, are particularly hardy.

Hog Island sheep numbers have decreased significantly since colonial times. Today, fewer than 200 registered Hog Island sheep remain, 54 of which currently live at Mount Vernon. In December 2008, Blackburn—in collaboration with the American Livestock Breeds Conservancy (ALBC) and Virginia State University—

collected and cryopreserved 253 semen samples from 10 Hog Island rams for the NAGP collection.

Whether the breed lived on the Mount Vernon estate while it belonged to George Washington is unknown, says Mount Vernon livestock supervisor Lisa Pregent. Washington's documents never mention the breed by name, but the Hog Island sheep probably have more in common with his flocks than with modern commercial breeds.

The same can be said of the Leicester Longwools living in Colonial Williamsburg. The once popular breed fell out of favor as newer breeds with more desirable meat characteristics rose to prominence. The last U.S. representatives probably died out in the 1920s or 1930s, according to Elaine Shirley, manager of rare breeds for the Colonial Williamsburg Foundation. In 1990, Shirley and her colleagues helped establish a new population of Leicester Longwools in the United States with sheep from Australia.

Though NAGP has not yet acquired germplasm from the Leicester Longwool flock in Colonial Williamsburg, they did obtain 92 blood samples from the flock, with the help of Virginia State University professor Stephan Wildeus.

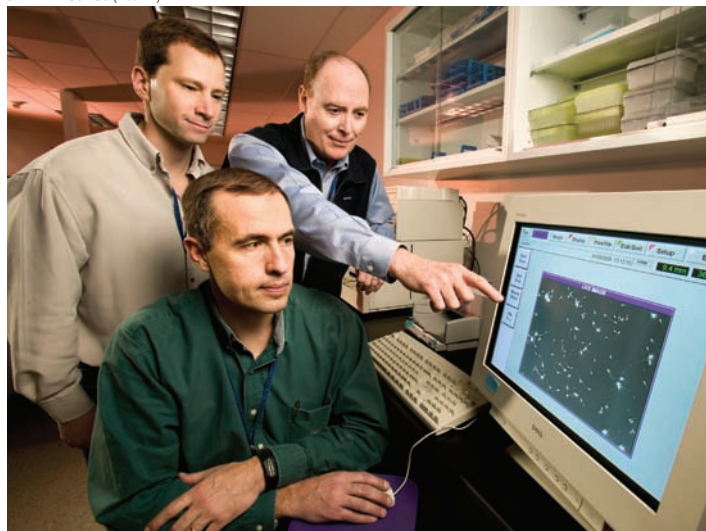
A Hog Island sheep at Mount Vernon.



STEPHEN AUSMUS (D1356-8)



Each year, Mount Vernon provides thousands of visitors with an important view of early-American agriculture. The estate's Hog Island sheep flock is an example of how sheep may have looked in George Washington's time and provides an important gene pool for present-day sheep breeders.



Computer-assisted sperm analysis facilitates evaluation of Hog Island ram samples by technician Scott Spiller (left), physiologist Phil Purdy (center), and geneticist Harvey Blackburn.

These rare breeds have regional and historical value, but conserving them is particularly important because of their genetic uniqueness.

“The more genetic diversity you have, the more ability you have to weather whatever storm might come,” Shirley notes.

Collection, Collaboration, and Conservation

Gathering blood and semen samples from these two breeds required the efforts of a diverse collection of people and organizations. While NAGP is a world leader in animal germplasm preservation, it has relied on assistance to build its large collection.

“Each collaborator brings to the table unique contributions,” Blackburn says.

The sheep germplasm collection was initially set in motion by ALBC, a nonprofit organization established in 1977 with the goal of protecting more than 150 historic breeds of livestock.

The conservancy has been in close contact with NAGP since the program was established in 1999 and has transferred the contents of its own genebank, established in the 1980s, to the national collection. These genetic materials include more than a dozen endangered breeds of livestock.



The impetus for the most recent germplasm collection was concern about the genetic heritage of the Hog Island sheep, says Don Bixby, ALBC’s technical program manager.

“When the feral sheep were removed from the island in the 1970s, they were removed from the selection pressure that had made them so adaptable to the harsh environment,” Bixby says.

Because of this, ALBC was anxious to preserve the sheep’s genetic materials before their new environments began to influence the traits that made the breed so unique, including hardiness, foraging skill, and reproductive efficiency. The conservancy put Blackburn in touch with James Rees, executive director of the Mount Vernon estate, who was delighted to hear that the Hog Island sheep had been singled out for their historic value.

The partnership has allowed each organization to benefit from the knowledge, skills, and equipment of their colleagues.

“The collaboration has been quite wonderful,” Bixby says. “We had the network and the knowledge of where these sheep were, but not the resources or the technical expertise to have a significant collection.”

Blackburn agrees that partnership was an essential part of the process.

“Here at NAGP, we have resources and a skilled staff. But working with other organizations has allowed us to accomplish many things that would have been impossible if we’d been limited to our own materials and expertise,” he says. “This collaboration has drawn together a large group of people to preserve part of our nation’s agricultural history.”—By **Laura McGinnis, ARS.**

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