

Study reveals top traits of different sheep breeds

August 9 2013



Columbia rams. Credit: Phil Purdy

In western states, where almost half of U.S. sheep are produced, the Suffolk ram is commonly used as the "terminal sire"—an animal with the best genetics to sire lambs for meat production. However, concerns about the ability of Suffolk-sired lambs to survive from birth to weaning, and then to harvest, raised some doubts about the Suffolk's value as a terminal sire.

Western producers are challenged by diverse management systems and production environments. Therefore, they need a comprehensive evaluation to help identify terminal-sire [breeds](#) best suited for their operations.

Scientists at the Agricultural Research Service's U.S. Sheep Experiment Station (USSES) near Dubois, Idaho, examined four breeds used to produce market [lambs](#). The team, which included scientists from Virginia Tech, Ohio State University, and the ARS Roman L. Hruska U.S. Meat Animal Research Center (USMARC) in Clay Center, Nebraska, studied critical performance traits of lambs sired by rams of Columbia, Suffolk, and Texel breeds and by a composite breed developed at USMARC. Scientists evaluated lamb survival from birth to [weaning](#); growth before and after weaning; changes in [body composition](#), such as fat and muscle relationships; efficiency of growth; and carcass merit and value.

From birth to weaning

"Our objective was to evaluate U.S. sire breeds side by side in an extensive rangeland production system," says ARS geneticist Tim Leeds. "Does breed of ram affect whether a ewe will become pregnant, how many lambs a ewe will produce, and performance of the progeny from birth until weaning?"

Scientists first determined the effects of ram breed on ewe reproduction, lamb survival, and lamb growth through weaning. They mated approximately 20 rams per breed to 574 Rambouillet ewes over a 3-year period. More than 1,800 lambs, produced from almost 1,000 matings, were subsequently evaluated.

"Breed of sire affected lamb growth from birth to weaning, but not survival," Leeds says. "As suspected, Suffolk-sired lambs were larger at

birth, so they grew faster—gaining 3 to 6 pounds more before weaning—and their survival was as good as or better than that of the other cross-bred lambs."

Suffolk gains in other traits

After weaning, lambs were fed a high-energy diet in a feedlot and weighed weekly. Ultrasound measurements were taken every 2 weeks to determine fatness and muscle development during the feeding period.

"Suffolk-sired lambs had the most rapid gains, were 10 to 16 pounds heavier, and had the most desirable leanness at the end of the postweaning feedlot trial," says David Notter, professor emeritus in the Department of Animal and Poultry Sciences at Virginia Polytechnic Institute and State University. "They were equal or superior to lambs sired by the other breeds in growth, fat depth, and loin muscle area."



Technician Tracy Northcutt uses diagnostic ultrasound to determine fat level and muscle development of lambs. Credit: Michelle Mousel

"Columbia-sired lambs had the least amount of back fat and the smallest loin muscle area compared with lambs produced by the other breeds," adds USSES geneticist Michelle Mousel. "Producers want to see larger loin muscle. But Columbia's leanness could be an advantage for consumers."

Breeds were also examined for feed efficiency, which refers to how well lambs convert feed into growth, says USSES geneticist David Kirschten.

"Suffolk-sired lambs were the most efficient during the study,"

Kirschten says. "They required between 5 and 8 percent less feed per unit of growth during 90 days in the feedlot than the other three breed crosses. Columbia-sired lambs required more than 15 pounds of additional feed compared with lambs from the other sire breeds at comparable body weights and rates of gain."

After lambs had reached prescribed market weights, carcass value and organ weight were evaluated with the help of Ohio State University scientists, who harvested animals and cut meat into marketable products.

"Because Suffolk-sired lambs were heavier at birth, weaning, and at completion of the feedlot trial, they also had heavier carcass weights, more kidney fat, and larger loin muscle area, although pound for pound, Texel-sired lambs were as well muscled as the Suffolk-sired lambs," Mousel adds.

Going head to head

Even though Suffolk-sired lambs were a cut above the three other crossbred groups for most traits, the other sire breeds still may have something to offer, according to scientists. Each sire breed has its own distinctive characteristics. For example, Texel-sired rams can be used to produce heavily muscled lambs that are ready for market at younger ages than Suffolk-sired lambs. Columbia-sired lambs may be marketed at older ages than Texel-sired lambs, without becoming too fat. USMARC composite-sired lambs may be ready for market at an intermediate age, size, and degree of fatness and muscling.

"Producers can use information from this study to help select sire breeds that will complement their production systems and improve the market value of lambs," Mousel says. "The take-home message is to know what weaning and market weights you want, what to feed your lambs, what type of environment they're reared in, and what breed of ewe you are

going to use."



Suffolk rams. Credit: Phil Purdy

"Because the Columbia didn't do nearly as well as the Suffolk, Columbia breeders may need to adjust their selection criteria, focusing more on growth and muscling if they wish to compete with the Suffolk as a specialty terminal-sire breed," Notter says. "But producers also value the dual-purpose capability and wool quality of the Columbia and may prefer to use it as both a maternal and sire breed."

The USMARC composite, developed as a genetic resource rather than a terminal-sire breed, has been surpassed by purebreds in terms of performance potential, Notter says. But it may have some use in stressful production environments that favor a lamb with intermediate growth potential that can be marketed at an intermediate weight.

"The Texel has a role to play typically if animals are harvested at lighter weights or under less intensive feeding," he says. "It might also have value in developing germplasm for future use."

Potential for new breeds

Scientists are developing new germplasm resources based on crosses among the Suffolk, Columbia, and Texel breeds. They hope to capture the growth traits of Suffolk, muscling traits of Texel and Suffolk, and fleece traits of Columbia and incorporate those traits into a higher performance terminal-sire breed that produces large, heavily muscled, efficiently growing lambs with all-white pelts.

"All-white pelts, which are used to produce high-quality apparel, are usually more valuable than pelts with dark colored fibers," says recently retired USSES research leader Greg Lewis.

"We can use breed diversity in terminal crossbreeding systems to improve production efficiency," Lewis says. "The recent data can be used to select terminal-sire breeds to accomplish specific production and marketing objectives and to develop composite genetic lines that incorporate the most favorable traits of different breeds. Composite genetic-sire lines that are suitable for challenging rangeland production systems have the potential to compensate for deficiencies in the current breeds."

More information: "Breed Matters: Selecting Rams for Rangeland

Production" was published in the August 2013 issue of *Agricultural Research* magazine. www.ars.usda.gov/is/AR/archive/aug13/

Provided by Agricultural Research Service

Citation: Study reveals top traits of different sheep breeds (2013, August 9) retrieved 20 March 2024 from <https://phys.org/news/2013-08-reveals-traits-sheep.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--