

Breeding Cows that Climb Hills to Benefit Land & Ranchers

Sustainable Agriculture Fact Sheet

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Commodity: Beef Cattle

Need: Improve land use and stocking rates

States: All Western states

Background: Throughout the West, ranchers graze cattle on rugged land, both publically and privately owned. Properly managed, cattle provide ecological benefits to natural areas and help control invasive weeds, but over-grazing can damage riparian areas and affect downstream water quality.

The Problem: Ranchers and land managers base stocking levels – the numbers of cows per acre – on the availability of forage in easy-to-reach areas including sensitive riparian areas where cows can stay close to water. This limits the number of cows per acre a rancher can graze, and leaves a lot of available forage untouched on steeper slopes and hillsides. If ranchers could stock their land with more hill-climbing cows, they could increase stocking rates as much as 30 percent while improving the rangeland. But there was no way to know if a bull or cow will produce hill-climbing calves.

The Research: New Mexico State University Range Science Professor Derek Bailey is changing that. With funding from Western SARE, he and other researchers are looking at the genetics of behavior – specifically to identify the genes linked to hill-climbing. Their goal is to develop an inexpensive screening test that allows ranchers to select stock with a genetic disposition to wander and climb the way they can already use genetics to select for production traits like growth rate or size.

“It’s brand new to identify genetic markers linked to animal behavior,” said Juan Medrano, a UC Davis animal geneticist collaborating on the project. “This could have a huge impact on food security and rangeland management.”

To gather the data, Bailey’s team has been tagging cattle on ranches across the West with global positioning system collars and tracking their every move for months at a time. They also draw blood from each cow, to identify genetic commonalities among the hill-climbers. The key is getting a huge amount of data, identifying specific genes shared by the hill-climbers, and making sure that the hill-climbing trait doesn’t also correlate with any unwanted traits like smaller size or worse temperament.

The Impact: The team is still analyzing the data, but believes the screening test is possible and hasn’t seen evidence that the hill-climbing trait comes with significant downsides. The broader impact of this research is that it’s opening a whole new arena of study into the genetics of animal behavior, which could have significant benefits for animal welfare in agriculture.

The Challenges Ahead: The land-use challenges that gave rise to this research will continue, as will the kind of animal-welfare concerns in agriculture that have already led to regulated or legislated changes in the poultry and pork industries. Scientifically breeding for behavior may be critical for producers to meet these challenges in the future.

Links:

Feature article: <http://www.westernsare.org/Learning-Center/From-the-Field/Researchers-Say-Hill-Climbing-Cows-May-Bring-Big-Benefits-for-Western-Ranchers>

Project reports: https://projects.sare.org/sare_project/sw15-015/

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