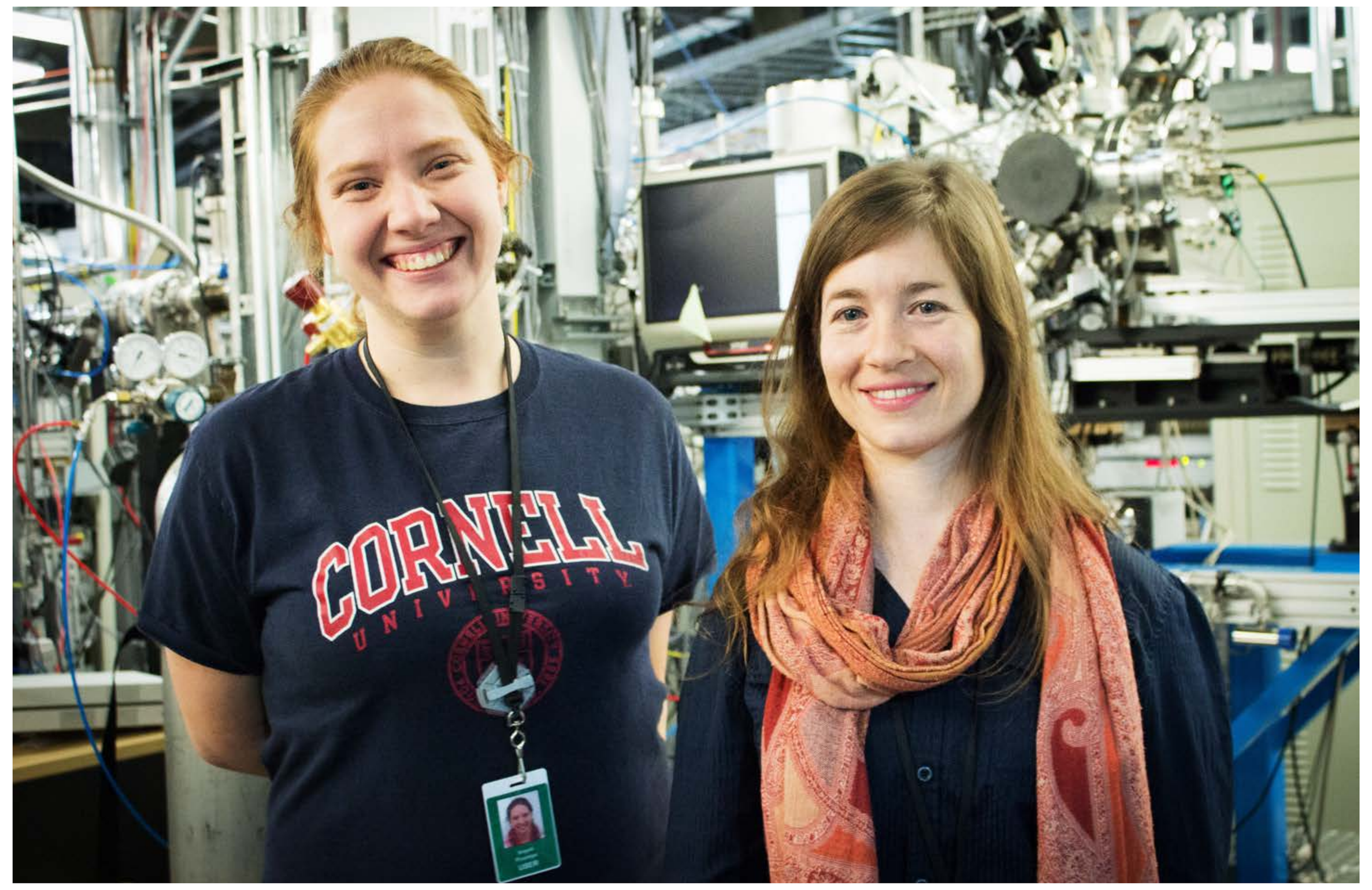
HELPING FARMERS

SCIENTISTS DISCOVER THAT CHARCOAL TRAPS AMMONIA POLLUTION

Cornell University scientists, along with collaborators, have shown that charcoal can absorb large quantities of nitrogen from the air pollutant ammonia, resulting in the potential to create slow-release fertilizers with more nitrogen than most animal manures or other natural soil amendments. Ammonia is common in fertilizers but is a highly reactive gas and an indirect contributor to climate change. Charcoal, in contrast, is a natural material that can retain and supply essential nutrients to plants. The study identified charcoal's ability to capture nitrogen from airborne ammonia, which paves the way to creating a slow-release fertilizer for field and greenhouse crop production.

DOI:10.3389/fpls.2015.005



PROTECTING CHICKENS FROM HEART DISEASE

The health and welfare of broiler chickens may be improved by the research conducted by University of Saskatchewan scientists. Broiler chickens are raised for meat and are genetically selected to grow fast, but this leads to health issues like heart disease. Heart pump failure is a major welfare issue for the broiler chicken industry and leads to economic losses of 1 billion annually. Using Mid-IR the researchers were able to identify misfolded and damaged proteins that build up in the chickens' heart. This protein buildup may be linked to how broiler chickens' genes respond to nutrition and environment.

DOI: 10.1080/03079457.2020.1757620.

FINDING THE FERTILIZER SWEET SPOT

Farmers walk a fine line when it comes to adding phosphorus fertilizer to their fields. If they don't use enough, they risk lower yields. If they add too much, the excess can be lost to runoff and lead to potentially toxic algae blooms in nearby lakes. Researchers moved science one step closer to finding the "sweet spot" for phosphorus fertilizer use. Using the CLS, the team gathered highly detailed information about how fertilizing with nitrogen and phosphorus changes the chemistry of soils and the availability of phosphorus for crops.

DOI: 10.1016/j.geoderma.2021.115274

MAKING TRACTORS DANCE

Recognizing that soil compaction is a yield killer for producers in intensively farmed areas of Canada and the world, Adam Gillespie from the University of Guelph is comparing various approaches to spreading out tractor weight in the field. Using the BMIT beamline, he is able to visualize and compare the chemistry and structures in soil to assess the impact of heavy farm equipment. It is a way of looking at soil health from an economic viewpoint rather than just an environmental perspective.

https://www.facebook.com/CanLightSource/videos/404752070669458/

MAXIMIZING SASKATCHEWAN CROP GROWTH

Saskatchewan soil is among the most nutrient-rich in the world. Researchers from the University of Saskatchewan used the CLS to better understand how phosphorus behaves in prairie soil and which type should be used in fertilizers for optimum growth. The study showed that retention of phosphorus in soil varied depending on the landscape conditions and fertilizer type. This research furthers our understanding of how to retain phosphorus in prairie soil and how to improve crop growth in Saskatchewan.

DOI: 10.2136/sssaj2012.0146

GROUND-BREAKING SOIL RESEARCH

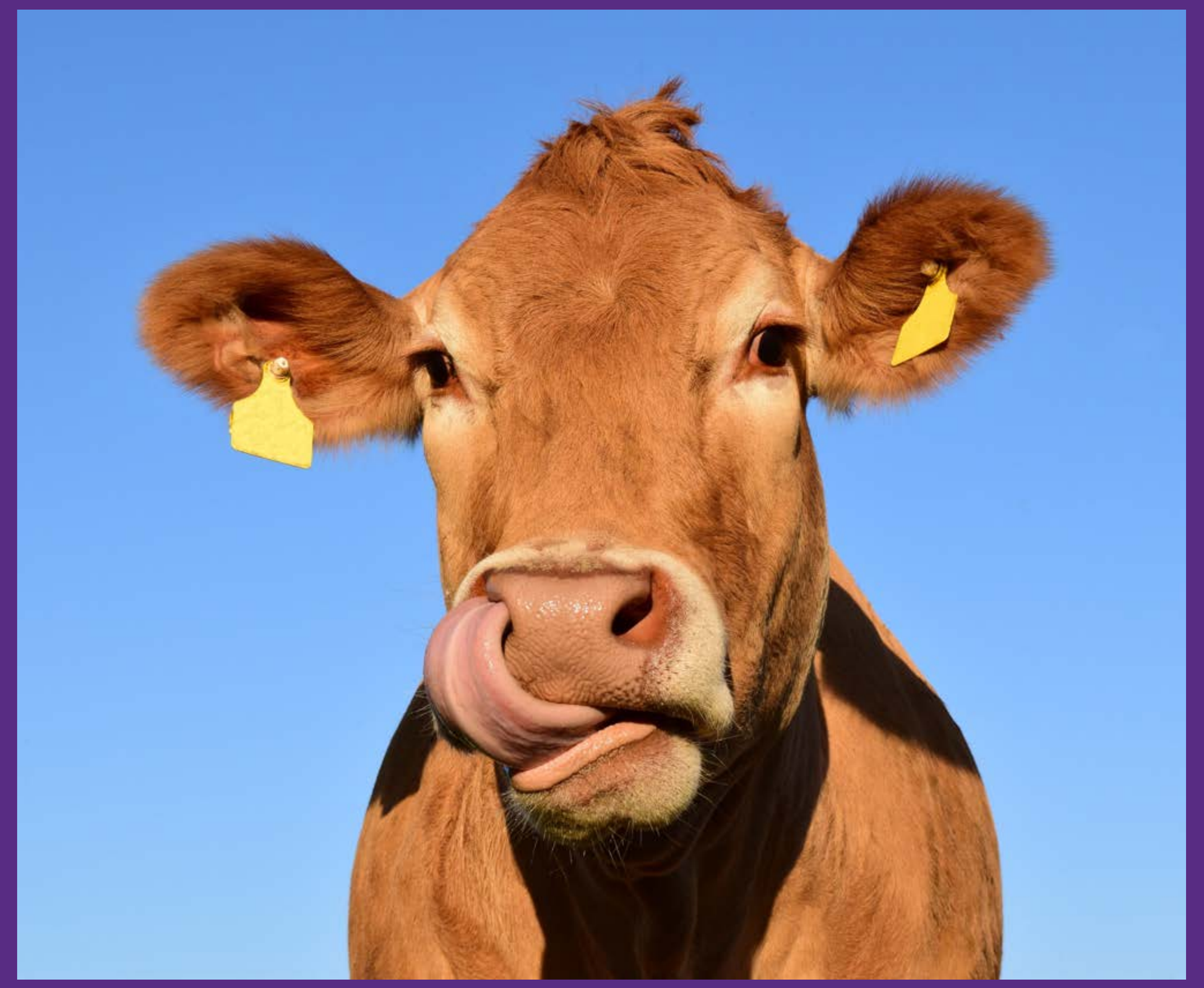
Researchers from the University of Saskatchewan collected and analyzed soil from across the prairies — including samples from one of the researcher's own farm. Using chemical analysis and synchrotron techniques on the HXMA and VLS-PGM beamlines at the CLS, the team looked at soil micronutrients in soil samples from Saskatchewan, Alberta and Manitoba. The study, which offers recommendations for improving fertilizer use and increasing crop yields for farmers, builds on previous studies they have completed as collaborators at the CLS.

DOI: 10.1139/CJSS-2020-0162

SUSHI FOR COWS

Cattle on the Prairies are hundreds of kilometres from the coast and yet it's possible that seaweed could make its way into their diet as an additive. Seaweed is a sustainable feedstock. It grows rapidly, and doesn't require arable land or fresh water to grow, so scientists at Agriculture and Agi-Food Canada's Lethbridge Research and Development Centre, want to use the rare sugars like seaweed glycans to promote specific bacteria growth that has beneficial properties in the intestines of cattle. If more livestock feed came from seaweed, less would have to be produced from traditional crops, such as corn.

DOI: 10.1038/s41467-018-03366-x



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