

Farming For Answers

Scientist Raises Disease-Prone Pigs For Medical Testing

BY WENDY LEE

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MINNEAPOLIS — Entrepreneur Scott Fahrenkrug sees raising pigs as one hearty business.

And that's not because of the food they can produce.

Fahrenkrug, a University of Minnesota professor, is changing genes in pigs so they grow up with diabetes or heart disease. Through his Minneapolis-based business, Recombinetics, he plans to sell the pigs to companies and labs for research or to test medical devices and drugs.

Genetically altering animals is a controversial practice, drawing the ire of animal-rights groups and those who believe that scientists shouldn't meddle with biological states. But Fahrenkrug believes that his business, which started in late 2008, will help improve medicine and devices before they are used on humans.

"Frankly, it's a hard sell to make sick animals," said Fahrenkrug, who keeps the pigs in a contract facility in Wisconsin. "The fact is, we need animal research to come up with the therapies."

Fahrenkrug said companies already use mice and rats — and pigs, for that matter — for medical purposes. But he said his business model would broaden the scope of testing because the pigs he plans to sell would be of similar weight as humans. Recombinetics would create "mini-pigs" for some companies that would weigh in the range of 150 to 200 pounds.

"We're trying to make them closer to people," Fahrenkrug said.

Dr. J. Michael Gonzalez-Campoy, CEO and medical director of the Minnesota Center for Obesity, Metabolism and Endocrinology, said using animals with ailments that resemble diseases in humans could ultimately make the drugs safer to use in human testing.

Fahrenkrug has big plans for Recombinetics and its team of four employees. Along with selling diseased pigs, the com-



RICHARD TSONG-TAATARI/MINNEAPOLIS STAR TRIBUNE/MCT
Scott Fahrenkrug, CEO of Recombinetics, is photographed at the University of Minnesota in St. Paul, Minn., on Oct. 12. Fahrenkrug is changing genes in pigs so they grow up with diabetes or heart disease. Through his Minneapolis-based business, Recombinetics, he plans to sell the pigs to companies and labs for research or to test medical devices and drugs.

pany also will raise pigs for use in medical devices, such as heart valves. Fahrenkrug estimates that the market for selling large animals for preclinical testing is \$150 million a year.

Recombinetics wants to expand its technology for the agriculture industry and license it to companies. Fahrenkrug said his firm can eliminate certain genetic traits within cattle, such as inferior reproduction.

Recombinetics hopes to raise \$3.5 million by January. The biotech firm signed a letter of intent to explore the possibility of building a facility at Elk Run's biobusiness park in Pine Island, Minn., where it could house 50 to 100 female pigs. Next month, Recombinetics will have office space at BioCombinator in St. Paul, Minn.

"This is yet another milestone

achieved," Fahrenkrug said. "We're marching forward."

He hopes to be profitable within 18 months of opening the Elk Run swine facility, and he plans to sell his first pigs starting late next year. Fahrenkrug has spent the past few years fulfilling patents and writing grant proposals for the business, while working his day job at the University of Minnesota.

Fahrenkrug, 48, who grew up in Manitou Springs, Colo., said he was fascinated with science at an early age. He enjoyed looking under rocks as a kid and loved reading science fiction as teenager. "I've been a biologist since I was born," Fahrenkrug said.

Extension Specialists Discuss Uses For Nitrogen Stabilizers

BROOKINGS — As we move toward fall fertilization season and planning for spring 2012, the question of nitrogen (N) stabilizers comes up. Can we apply a material with our N fertilizer to protect it from loss? SDSU Extension Soils Specialist Ron Gelderman and SDSU Extension Field Specialist Mark Rosenberg address this question recently.

Nitrogen in the form of urea can be lost through ammonia volatilization when surface applied. Eventually all forms of nitrogen will convert to nitrate and are subject to leaching or denitrification losses. For growers to obtain a bigger bang for their applied N buck, different N materials and nitrogen additives may be used, but timing and placement is the key.

Nitrogen materials applied in the fall should be delayed until after soil temperatures are below 50 degrees. As of Oct. 16, soil temperatures at the 4-inch depth were still ranging from 51 to 57 degrees. In addition, N should be either incorporated with tillage or, with no-till, it should be injected into the soil. If this is not possible or practical, N applications should be delayed until late winter or early spring, and there is no snow cover. At these times conditions are usually cool and moist and do not favor ammonia volatilization.

If surface N applications need to be made later in the spring, a urease inhibitor should be considered with the application. For coarse textured soils in eastern South Dakota and medium textured soils in southeastern South Dakota, which have a profile full of water, growers should consider use of a nitrification inhibitor with spring N applications.

Effective urease and nitrification inhibitors are discussed in a new publication "Nitrogen Extenders and Additives for field crops" and can be found at <http://igrow.org/agronomy/corn>.

Cover Crops Provide Quality Fall Forage

BROOKINGS — In the fall, pasture forages reach full maturity and, in the process lose much of their nutritional value, says Justin Fruechte, forage specialist for Millborn Seeds.

"This time of year many pasture grasses have lost their nutritional value and are dry or dormant," Fruechte said.

Warner cattleman John Braun isn't too worried. In just a few weeks his cattle will be treated to a high quality, palatable feed source when he turns them out to graze on cover crops.

"The cattle like the cover crops and they definitely do better than maintain on them. They put body weight back on," said Braun, who operates a commercial cow/calf and finishing operation.

Cover crops are quality fall forage option because they remain palatable and protein rich long after the first freeze, explains Eric Mousel, cover crop and alfalfa specialist with Millborn Seeds.

"The right cover crop mixture can provide cattle with as much as 22 percent protein. Cover crops are also much more palatable than mature grasses because they do not produce nearly the amount of cellulose that grass does," Mousel said. "Cellulose takes a long time to break down in the rumen. As grasses mature this time of year the amount of cellulose in the stem increases, decreasing the available nutrients in the plant."

Braun began planting cover crops in prevented plant areas five years ago to help absorb additional moisture and prevent nitrogen leaching. The fact that cover crops provide his cattle

with inexpensive, high quality forage in the fall is an additional benefit he says.

"Feeding them on cover crops in the fall saves us money. If you figure that it costs about \$1 per head per day to feed a cow once she's off pasture, every day she's on a cover crop adds up," Braun said.

The pure economics of cover crops make it a fall grazing option more cattle producers should consider, says Mousel.

"They are such a good quality, low-cost feed. When cattle producers turn calves out on cover crops, they can expect to see weaned calves gain between 2 to 3 pounds per day," Mousel said.

On a 500-pound steer, Mousel calculates that cover crops add up to about a 25 cents cost of gain and a \$1.25 profit per pound of gain.

"That's huge," Mousel said. "Grazing cows on cover crops, is a savings of anywhere from 50 cents to \$1.50 per head per day."

When working with cattle producers considering cover crops as a fall forage option, Fruechte says bloat is one concern many have. Any cattle that have an abrupt change in their diet can become ill. Offering grass hay to include a higher percentage of dry matter in their diet or slowly introducing the cattle to the cover crop are both ways to minimize the risk.

To learn more about selecting the right cover crop mixture for your operation contact Justin Fruechte or Eric Mousel at 888-820-4007 or justinf@millbornseeds.com or ericm@millbornseeds.com.

New Field Specialists Usher In A New Era Of SDSU Extension

BROOKINGS — SDSU Extension has hired 44 Field Specialists who will work in eight Regional Extension Centers across South Dakota. During a news conference Thursday in Brookings, Barry Dunn, Dean of the South Dakota State University College of Agriculture and Director of SDSU Extension, announced the names of the new hires, and said a new era in SDSU Extension had begun. The Regional Extension Centers open next week.

"(Oct. 21) marks the end of one era in SDSU Extension. Next week, we welcome a new day in SDSU Extension based on the talents of new Field Specialists and the existing State Specialists, efficiencies found in Regional Centers, and information delivery through the iGrow learning platform," Dunn said. "As a result, SDSU Extension is stronger than ever. We remain deeply committed to serving South Dakotans and, in this new era, we will continue to provide them with the research and information they need to be competitive in today's economy."

The new era Dunn refers to came about in order to comply with state budget cuts set by the Legislature and Gov. Dugaard earlier this spring. "In managing under the new budget environment, SDSU Extension called on staff and stakeholders to help define what elements must be carried forward, and what elements can be retired," Dunn said. "As a result, next week we embark on the largest reorganization of SDSU Extension since its creation in 1914."

Dunn also unveiled a new logo for SDSU Extension. "We wanted a new look to reflect our new way of doing business," Dunn said.

IMPACTS

As a result of the reorganization, Dunn said SDSU Extension will live within the reduced fiscal boundaries of the 2012 state budget.

"Nothing was held back in this reorganization," Dunn said. "Complying with a 10 percent state budget cut is at the root of this entire restructuring. In everything we do, we are careful to be prudent with our dollars and absolutely conservative in our spending. In creating Regional Extension Centers, we relied primarily on surplus property. We recycled and reused existing equipment, while at the same time worked to assure the continued operation of county facilities that will house 4-H Youth Program Advisors."

The reorganization allowed SDSU Extension to reprioritize programs. Capstone programs now include; Competitive Livestock Systems, Competitive Cropping Systems, Food and Families, Communities and 4-H Youth.

"We notably increased support to 4-H and youth and priority programs," Dunn said.

SDSU Extension will increase its use of communications technology and has developed the iGrow teaching platform to deliver information over the internet. A new administrative structure increases communication between Field Specialists and SDSU academic departments.

"We want the people of South Dakota to know that we have wisely and prudently used financial and staff resources," Dunn said. "The new SDSU Extension system is strong, staffed with Field Specialists who will, for the first time, all be required to hold a master's degree or earn one in five years. We will be able to deliver programs that South Dakotans need."

THE PEOPLE

Karla Trautman, Associate Director of SDSU Extension, announced the

conclusion of searches to fill Field Specialist and Program Director positions.

"Looking across the board at all Field Specialist and 4-H Youth Program Advisor positions, there were more than 1,000 applicants. Our search processes strictly adhered to university hiring practices. Search committees reviewed all applications and forwarded lists of candidates that met qualifications," Trautman said.

Trautman announced the names of the 44 SDSU Extension Field Specialists, a position with expanded training requirements and duties. She also announced the appointment of three administrators.

Rosie Nold has been appointed Program Director for Agriculture and Natural Resources; David Olson has been appointed Program Director for Community Development; and Suzanne Stluka has been appointed Program Director for Food and Families. Offers have been extended for the Program Directors of 4-H and Youth Development; and Native American Programs.

Searches are currently underway to fill the 32 4-H Youth Program Advisor positions.

SDSU Extension and South Dakota counties share the cost of 4-H Youth Program Advisors.

All South Dakota counties participated in this program. When SDSU Extension negotiated new 4-H service agreements with all South Dakota counties in 2011, they were asked to consider the level of support they would choose to invest. Some counties, with higher youth populations, chose to have one advisor serve only their county. Other counties formed partnerships with neighboring counties and will share the 4-H Youth Program Advisor.

THE INFRASTRUCTURE

SDSU Extension Field Specialists will be housed in one of eight regional centers located in Aberdeen, Lemmon, Mitchell, Pierre, Rapid City, Sioux Falls, Watertown and Winner. The 4-H Youth Program Advisors will be located in counties.

To enhance access to information, SDSU Extension launched iGrow, a free online teaching platform.

"iGrow was designed to remove the factors of time and space from teaching," Dunn said. "It allows SDSU Extension to deliver information and resources to all South Dakotans 24-7. Any time they are interested, iGrow connects them to a robust variety of information, in one location — unlike SDSU Extension has been able to offer until this point."

THE TRANSITION

Monday is moving day for the new Field Specialists. On Oct. 24, Regional Centers will not be open for business as the new offices are made operational.

"But at the start of business Tuesday, the Regional Offices will be open and will continue to deliver Extension programs," Dunn said.

As SDSU Extension enters this new era, he says peers from Land Grant universities and Extension across the nation will be watching.

"The South Dakota model and process will be considered as other states follow our footsteps," Dunn said.

Dunn's announcement was followed by remarks from Walt Bones, South Dakota Secretary of Agriculture; Paula Hamilton, President of the State 4-H Leaders Association; and Myron Johnson, Codington County Commissioner.

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