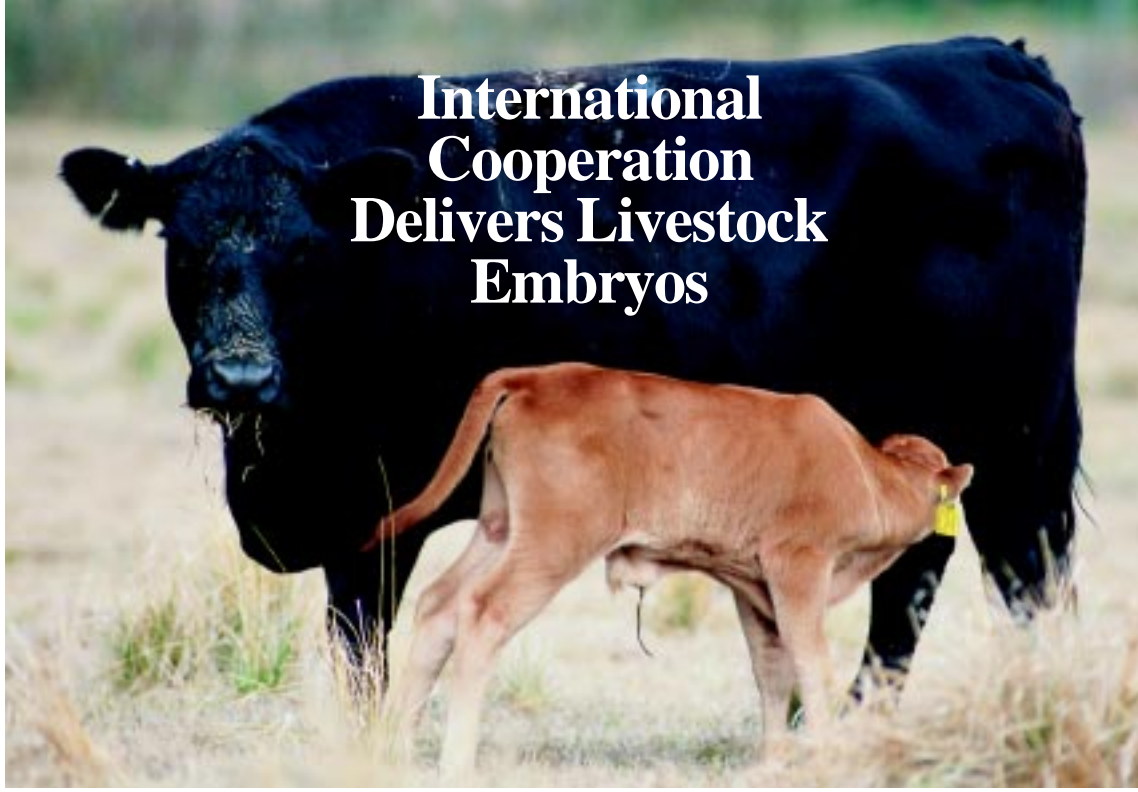


International Cooperation Delivers Livestock Embryos

SCOTT BAUER (K7609-1)



Angus surrogate mother nurses her Romosinuano embryo transfer calf. Initially, scientists are investigating the influence of surrogate breed on Romosinuano calf traits such as length of gestation and birth and weaning weights.

Five years of research were on the line, and Agricultural Research Service physiologist Chad Chase was nervous. A Venezuelan national guardsman said he needed to inspect Chase's canister of cryo-preserved Romosinuano cattle embryos before the scientist could board a flight back to Florida. Inspection would mean death for the embryos.

Chase, a Venezuelan colleague, and a veterinarian with USDA's Animal and Plant Health Inspection Service tried to explain this, but the guard was firm.

The veterinarian had put special seals on the canisters to prove they would not bring disease into the United States. And he'd told ARS' Chad Chase that if the seals were broken, the embryos would have to be destroyed.

The travelers decided to put off their flight—until the next day.

But the next day was worse. The guard on duty then wanted to use an X-ray as an alternative to opening the canister. The X-ray could deform the embryos. Unfortunately, Chase

couldn't argue; he was told to proceed to the boarding gate.

His colleague, Venezuelan professor Jorge Beltran of the University of Central Venezuela at Maracay, stayed behind, calmly explaining the situation to the guard and producing documentation to prove the "Vapor-Shippers" held cattle, not contraband. Finally, the guard relented.

Today, 67 Romosinuano calves with a big future enjoy life at the ARS Subtropical Agricultural Research Station in Brooksville, Florida. They owe their lives in part to the professor's ability to keep cool under pressure.

"I was very persistent. I think that's what saved us," says Beltran, who heads his university's cattle breeding and genetics program. "The final call for boarding came and they were still held up at the gate, but I just kept talking. I think that's what finally made the guard give up."

"I was relieved when I saw the canisters with their seals unbroken at air cargo pickup in Miami," says Chase. It wasn't the first time, he says, that he had relied on Beltran to

solve problems. The professor had laid much of the groundwork for getting the embryos to the United States.

"To me, it was exciting to see so many people working on this collaborative USDA project. We all worked together; there were no stars," says Beltran. "It opens new opportunities in cooperative research."

The Romosinuano project was the brainchild of animal scientists Andrew C. Hammond and Timothy A. Olson. Hammond heads the Brooksville lab where Chase works, and Olson is a professor of animal breeding at the University of Florida at Gainesville. They made the initial visits to Costa Rica and Venezuela to evaluate the breed's potential.

Their plan was to give the Southeast an animal with improved temperament, good heat and pest tolerance, and early maturation. Brahman cattle, often favored in the Southeast, offer heat and disease tolerance, but their temperament and meat quality vary. They also raise a farmer's overhead by taking longer to reproduce.

Beltran had done a sabbatical with Olson and Hammond. And he knew

Romosinuano breeder Carlos Rodriguez, also from Venezuela, which made him a natural contact.

"It's the breeders and ranchers we need to thank," says Chase. "Caracollo Carrero, president of ASOROMO, the Romosinuano breeders' association in Venezuela, and his colleagues, Carlos Rodriguez, Luis Mantilla, and Valmore Sanchez—they made this possible; they encouraged us."

And encouragement was needed. Romosinuanos are native to Colombia, but civil strife there had halved the number of animals surviving since 1987. Many survivors were sent to Venezuela. But getting embryos from there also required disease control.

In Venezuela, there were nearly 500 purebred Romosinuanos owned by five breeders. But there was something else there, too: foot-and-mouth disease, a virus that causes painful sores on livestock's feet and mouths, making them stop eating and sometimes killing them. Controlling even a modest U.S. outbreak could cost more than \$50 million, according to APHIS.

Foot-and mouth disease has been eradicated in the United States. The last outbreak was in 1929. Congress, in 1950, made it unlawful to possess live foot-and-mouth virus on the U.S. mainland—even in the form of vaccines. Study of the disease here is restricted to USDA's Foreign Animal Disease Laboratory at Plum Island, New York.

Importing embryos from countries where the virus was endemic was illegal before 1991. But APHIS designed special protocols for legal, disease-free importation of bovine embryos. Agency veterinarians tested donor animals' body fluids, such as blood and the uterine fluid expelled when embryos were collected.

To further guard against infection, APHIS required all embryo transfer equipment to come from the United States. Meeting this mandate proved challenging when airline embargoes caused shipping delays.

Chase and his team also gave the embryos a special washing treatment required by law to guard against infection. After washing, the leftover solution was tested for traces of foot-and-mouth virus.

SCOTT BAUER (7612-17)



Senopol surrogate mother with Romosinuano embryo transfer calf. A tropically adapted breed from the Caribbean, Senopols are increasingly popular throughout warmer U.S. regions.

APHIS veterinarian David Vogt also inspected the Venezuelan university's facility. It is in a valley isolated by mountains, so no other cattle herds could come in contact with the parent animals. The self-contained center has barns, laboratories, and a housing complex for the scientists.

Why all the effort? This project is probably the only chance U.S. researchers will have to fully evaluate this breed. Foot-and-mouth-disease-free Costa Rica has Romosinuanos. In fact, Chase and his colleagues have raised a herd from Costa Rican embryos collected by University of Missouri researchers in 1990 and 1992. But these animals aren't pure Romosinuanos, so they don't tell

much about Romosinuanos' true potential.

A purebred Colombian Romosinuano, however, must be paid for with lots of planning and discussion. Many scientists, both in the United States and Venezuela, brought their expertise to the project. Ron Randel, a researcher with Texas A&M University, served as a consultant. Geneticist Larry V. Cundiff from ARS' Roman L. Hruska U.S. Meat Animal Research Center in Clay Center, Nebraska, accompanied Chase and Olson to help pick the Romosinuano parents. A total of eight Romosinuano families were included in the project to ensure genetic diversity of the U.S. Romosinuano herd.

Chase says credit also goes to embryo transfer specialists, Jim Griffin of Reproductive Technology International in Plant City, Florida, and to Clifton Murphy, a veterinarian from the University of Missouri who flew to Venezuela to meet Chase and collect the embryos. Reproductive physiologists Juan Troconiz and Pedro Bastidas from the University of Central Venezuela in Maracay also cooperated, he says.

"That's what scared me about the national guardsman at the airport," says Beltran. "So many people gave so much to make this project a success, and just one person could have undone everything."

"We did have some difficult situations, but ultimately we were successful," says Chase. "It's been a fantastic group effort." —By **Jill Lee, ARS.**

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