Embryo transfer results in healthy purebred Yellowstone bison calf

August 31 2012

CSU researchers have successfully reproduced a purebred bison calf at the Bronx Zoo by removing the embryo of a purebred Yellowstone bison that had been exposed to disease, washing it free of disease and implanting it safely into a healthy, commercial bison with ancestral cattle genes.

Yellowstone National Park has two of the last remaining large herds of pure-bred bison in North America, but moving them out of the park to

reproduce has been tough with public concerns over their widespread exposure to disease.

Now Colorado State University researchers have successfully reproduced a purebred bison calf at the Bronx Zoo by removing the embryo of a purebred Yellowstone bison that had been exposed to disease, washing it free of disease and implanting it safely into a healthy, commercial bison with ancestral cattle genes.

A healthy male purebred bison calf was born at the zoo on June 20 this year.

Ultimately, the science means that more purebred bison could be created using this embryo transfer approach and from this calf – and other Yellowstone bison - for zoos, wildlife parks and others around the world. The Bronx Zoo participated in the project as part of an effort to expand its bison herd.

In October, Colorado State University reproductive physiologist Dr. Jennifer Barfield and her team nonsurgically implanted the embryo from a Yellowstone bison cow maintained at the CSU Animal Population Health Institute's wildlife research facility in Fort Collins. The bison are quarantined because of their potential exposure to disease, which afflicts many births in the park.

Once Barfield "washed" the embryo and removed the threat of diseases such as brucellosis, the embryo was implanted in the uterus of a disease-free female bison. This surrogate bison cow was then transported along with 15 other bison donated by the American Prairie Reserve to the Bronx Zoo.

"The Bronx Zoo has been working for years to secure pure bison to establish a breeding herd that could supply animals for restoration

programs," said Dr. Pat Thomas, Wildlife Conservation Society vice president/Bronx Zoo general curator and associate director. "Dr. Barfield and her team have provided an innovative way to rescue these valuable genes and allow us to create this important herd."

"This science illustrates that we can engineer breeding of pure-bred bison to be disease-free despite the diseases that can afflict the bison population at Yellowstone," said Barfield, an assistant professor in the university's Department of Biomedical Sciences, part of the internationally known College of Veterinary Medicine and Biomedical Sciences. Barfield also worked with George Seidel, University Distinguished Professor, on the project.

"In Yellowstone, the bison do not have trouble reproducing," Barfield said. "It's the process of removing animals that have been exposed to disease from the park so that their valuable genetics can be incorporated into other herds or used to create new herds that is the problem. The Bronx Zoo has been a wonderful partner in this along with the American Prairie Reserve and the Animal and Plant Health Inspection Service of the USDA."

The American Prairie Reserve aims to create and manage a prairie-based wildlife reserve that - when combined with public lands devoted to wildlife - will protect a unique natural habitat, provide economic benefits and improve public enjoyment of prairie landscape.

"This is a great achievement to add to our list of accomplishments at the Animal Reproduction and Biotechnology Laboratory," said Thomas "Tod" Hansen, director of the lab at Colorado State. "We can use these genetics so they can go into other herds. The project will serve as a model for mitigating diseases, particularly brucellosis in genetically valuable bison."

Provided by Colorado State University

Citation: Embryo transfer results in healthy purebred Yellowstone bison calf (2012, August 31) retrieved 24 April 2024 from
https://phys.org/news/2012-08-embryo-results-healthy-purebred-yellowstone.html

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