

'Test tube' calf: Food and fertility

A healthy 95-pound calf is the outcome of the first successful laboratory fertilization of a bovine egg by bovine sperm. While such procedures have been used for human conception (SN: 1/17/81, p. 38), previous animal successes have involved only a few litter-bearing animals, such as mice, with short gestation periods. Because the cow's reproductive system far more closely resembles the human system, further experiments with cows are expected to lead to more effective clinical procedures to initiate human pregnancies. More directly, the work with cows is expected to boost livestock production.

"I think that the facility to handle eggs and sperm *in vitro* in this way opens the door to overcoming human infertility. In animals we are not constrained by the same ethical problems and implications," says Benjamin G. Brackett of the University of Pennsylvania. But he adds, "Perhaps the greatest implication for human beings is in more efficient production of food for human consumption."

The cattle industry has already produced thousands of animals from proce-

dures in which an embryo is transferred 5 to 12 days after fertilization into a recipient cow less valuable genetically than the natural mother. Because with *in vitro* fertilization the natural mother would provide only the eggs, Brackett suggests that a normal egg might even be recovered from a cow that is infertile.

The procedure could also conserve the eggs and sperm of valuable animals by bringing a small number of sperm cells directly into contact with an egg. Currently with artificial insemination a valuable bull can sire 50,000 offspring a year. Brackett projects that with *in vitro* fertilization, one bull could sire millions of calves annually.

In the recent work, the egg was obtained from a hormonally treated Holstein cow and the sperm from Holstein semen provided by a breeders' cooperative. After 24 hours the egg showed signs of fertilization, and after 47 hours the then 4-cell embryo was surgically transferred into the oviduct of a recipient cow. After an uneventful gestation, a male calf was born 280 days later, at the New Bolton Center for Animal Research.



Lynne R. Klunder/Univ. of Penn./New Bolton Ctr.

Members of the research team include Brackett, Daniel Bousquet, Melinda L. Boice, William Donawick, James F. Evans and Michael A. Dressel. □

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