

Genetic Gain Full Throttle

Accelerating genetic improvement through technology.

Story & photos by **Troy Smith**, field editor

Thanks to the cumulative effects of technologies, the coupling of assisted reproduction tools with genomic selection will enable the beef industry to make genetic gain two to eight times faster. So said Mark Allan, director of marketing and genomics for Trans Ova Genetics, in a presentation to the Applied Reproductive Strategies in Beef Cattle (ARSBC) symposium hosted Aug. 17-18, in Davis, Calif. Allan said rapid gains will be accomplished by reducing the generation interval through genetic evaluation and screening of *in vitro*-fertilized embryos used in embryo transfer (ET) programs.

Allan reviewed the evolution of reproductive technologies, which started with early application of artificial insemination (AI) in the 1950s and advanced to ET in the 1970s. *In vitro* fertilization (IVF) and cloning were implemented in the 1990s, and gender-selected semen in the 2000s. Allan explained that one of the fastest-growing applications of combined assisted reproduction tools is the use of sexed semen with IVF embryos.

“IVF provides embryo production on open, pregnant, subfertile and prepubertal

females, and it’s the best place to use sexed semen,” opined Allan. “You can get more than one calf per year out of those really good cows and heifers — of the sex you desire most.”

Reviewing the IVF process, Allan described how a donor female’s oocytes (eggs) can be retrieved, fertilized and cultured in the laboratory, and resulting embryos transferred to recipient females within eight days. While genomic testing allows for genetic evaluation of both donor females and sires at a young age, generation interval could be reduced and genetic gain advanced more quickly if IVF embryos could be tested for genetic merit prior to embryo transfer. That is coming, explained Allan, through preimplantation genetic diagnosis of IVF embryos and the subsequent screening and transfer of selected IVF embryos.

“It’s coming,” said Allan, “and the opportunity is huge for application in the commercial sector, as well as in nucleus (seedstock) herds.”

Allan spoke during Tuesday’s closing session. For more information, visit the Newsroom at www.appliedreprostrategies.com



► Referring to assisted reproductive technologies, Mark Allan, director of marketing and genomics for Trans Ova Genetics, said, “the opportunity is huge for application in the commercial sector, as well as in nucleus (seedstock) herds.”

to view his PowerPoint, read the proceedings or listen to the presentation.



Editor’s Note: Troy Smith is a freelance writer and cattleman from Sargent, Neb. Comprehensive coverage of the symposium is available online at www.appliedreprostrategies.com. Compiled by the Angus Journal editorial team, the site is made possible through sponsorship by the Beef Reproduction Task Force.

Fig. 1: *In vitro* fertilization timeline

