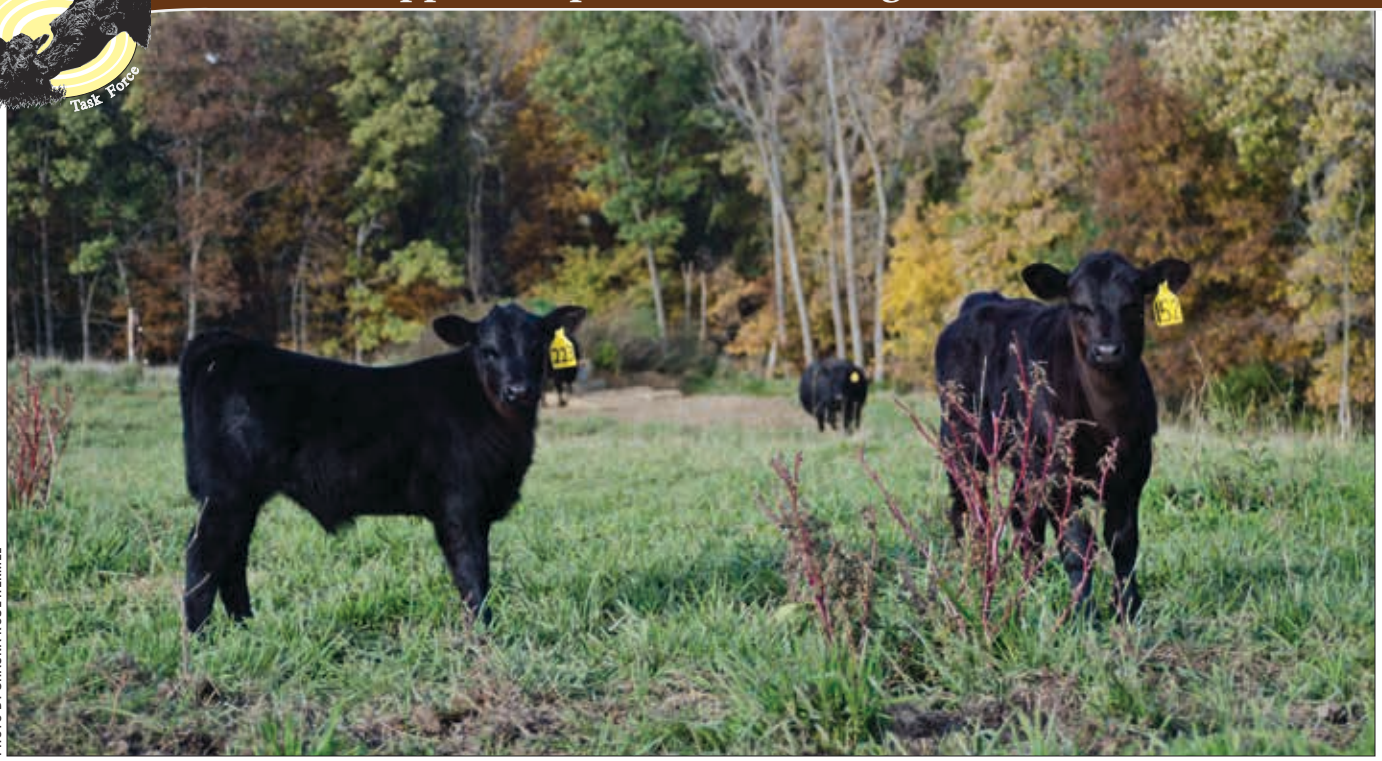

PHOTO BY SHAUNA ROSE HERMEL

Genotyping Embryos

Reproductive physiologist shares progress scientists have made in genotyping *in vitro*-produced embryos.

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

Spurred by the need for increased agricultural production with greater efficiency, the related need to produce more offspring from genetically and phenotypically superior cattle has led a worldwide increase in the number of *in vitro*-produced (IVP) embryos utilized in embryo transfer (ET). However, the production value of the resulting offspring remains unknown until the calf is born and a DNA test can be performed to assess the individual's genetic merit.

"There is a need to reduce the generation interval and develop a system for the genomic predilection of bovine *in vitro*-produced embryos prior to transfer," said California Polytechnic State University reproductive physiologist Fernando Campos-Chillon in a presentation to the Applied Reproductive Strategies in Beef Cattle (ARSBC) symposium in Davis, Calif.

Campos-Chillon discussed techniques involved in preimplantation genetic diagnosis (PGD), including embryo biopsy and associated challenges. He also discussed cryopreservation of IVP embryos and their viability after transfer.

According to Campos-Chillon, Piezo-assisted drilling (which he likened to a tiny jackhammer) and laser-assisted drilling are preferred IVP embryo biopsy techniques, resulting in high embryo survival rates as compared to alternative methods. A technical challenge to genotyping embryos remains due to the limited amounts of DNA obtained from biopsied cells.

►"Are we closer to efficient embryo genotyping? A bit, I think," said Fernando Campos-Chillon, California Polytechnic State University reproductive physiologist.

Campos-Chillon noted the relatively low tolerance to freezing of IVP embryos, due to high lipid content. He explained methods scientists have developed to increase the success of embryo cryopreservation.

"Are we closer to efficient embryo genotyping? A bit, I think," stated Campos-Chillon. "The good news is that the field of molecular biology advances at a fast pace, and the technologies most likely will become more sensitive and reliable."

In closing, Campos-Chillon cautioned the audience to remember that while evaluating DNA for eventual calculation of genomically enhanced EPDs, the role of epigenetic effects (external and environmental factors that may influence gene expression) and their correlation with genotype, phenotype and individual performance should be considered.

Campos-Chillon spoke during Tuesday's closing ARSBC session. For more information, visit the Newsroom at *www.appliedreprostrategies.com* to view his PowerPoint, read the proceedings or listen to his presentation.

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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.*