Diet supplementation alters oocyte lipid content and developmental competence in mares

Giovana Catandi \textsuperscript{a}, Stokes J \textsuperscript{a}, Maclellan L \textsuperscript{a}, Broeckling C \textsuperscript{b}, Carnevale E \textsuperscript{a}

\textsuperscript{a} College of Veterinary Medicine and Biomedical Sciences, Colorado State University (CSU), Fort Collins, CO 80523, USA
\textsuperscript{b} Proteomics and Metabolomics Facility, CSU

Materials and Methods

Study 1:
- Oocytes were collected from preovulatory follicles after induction of follicular maturation from mares aged 16-22 years (n=9) before (PRE) and after ≥ 8 weeks (POST) of supplementation with a Complex Nutrient Blend (CNB) of commercially available feed additives\textsuperscript{a}, including minerals, vitamins, L-carnitine, omega-3 fatty acids, pre- and pro-biotics.
- Denuded oocytes were assessed for triglyceride (TG) composition by liquid chromatography–mass spectrometry (LC-MS).

Study 2:
- Oocytes were collected from mares aged 18-24 years (n=5/group) after ≥ 8 weeks of supplementation with CNB or with an equicaloric grain control diet (GRN, 450g corn, oats and barley, and 60ml of corn oil daily).
- Oocytes were injected with frozen-thawed sperm from a stallion. After ICSI (D0) Cleavage was assessed at D1-2 and blastocyst formation at D7-8.

Results

Study 1: Total TG abundance was lower (P=0.005) in oocytes collected after (POST) versus before (PRE) supplementation with CNB.

Study 2: Cleavage rates were similar (P=0.2); however, more (P=0.03) sperm-injected oocytes developed into blastocysts for CNB (n=15) than GRN (n=19).

Conclusions
- Dietary supplementation of a complex nutrient blend to older mares resulted in reduced abundance of TG in oocytes and improved developmental potential.
- The extent that diet supplementation improves oocyte competence by altering the lipid profile is still to be determined.

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