Effects of restricted dietary intake on protein expression of oviductal glycoprotein 1 (OVGP1) in the oviductal ampulla of beef cows

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Introduction

In vitro production of embryos (**IVP**) results in poor pregnancy rates, with 10 to 40% of embryos transferred surviving to term.[1,2] Inclusion of oviductal fluid (OF) in the culture media improves success of IVP and pregnancy rates, but factors that influence OF composition are not well investigated.[3] Therefore, we examined the effects of restricted maternal dietary intake on expression of oviductal glycoprotein 1 (**OVGP1**; or oviductin), a highly conserved glycoprotein involved in fertilization and early embryo cleavage.

Materials & Methods

Multiparous nonpregnant beef cows were randomly assigned to one of 2 dietary intakes (n=9 per group) designed to maintain (control [**CON**]) or lose (−0.7 kg/d, negative [**NEG**]) BW for a 9-wk feeding period. Over the last 13 d of the dietary intake treatment, cows were exposed to the Co-Synch + CIDR estrous synchronization protocol and slaughtered 3 d later. At slaughter, cross sections of the oviductal ampulla adjacent to the ovary containing the corpus luteum were fixed in formalin, embedded in paraffin, sectioned, and stained using a primary antibody against OVGP1 and a fluorescently-labeled secondary antibody. Intensity of immunofluorescent staining for OVGP1 was quantified by image analysis, and differences between intake groups analyzed by t-test.

Results

Change (final – initial) in BCS and BW were greater for the NEG compared with CON cows (BCS: -1.06 vs. -0. 50, $P < 0.03$; and BW: -40.8 vs. -3.6 kg, $P < 0.0001$).

The OVGP1 glycoprotein was expressed in the luminal epithelium of the ampulla (**Figure 1**), and site of expression did not differ between NEG and CON intake groups (data not shown). Intensity of staining also did not differ ($P > 0.30$) between NEG and CON intake groups (7.110 vs. 7.153 arbitrary intensity units; SEM = 0.059).

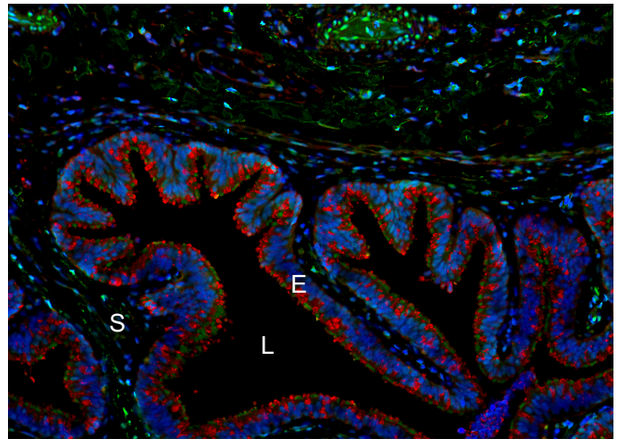

Figure 1. Immunofluorescent staining for OVGP1 protein (reddish) in cow oviductal ampulla. Bluish staining = DAPI (nuclei) and greenish is autofluorescence. L = lumen; E = epithelium; S = stroma. Micrograph taken at 200X.

Conclusion

We conclude that restriction of maternal nutrient intake for 9 weeks did not influence protein expression of OVGP1, a major oviductal glycoprotein.

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References Cited

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