

Non-esterified fatty acids in early luteal bovine oviduct fluid mirror plasma concentrations

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Oviduct fluid (OF) provides the environment for the early embryo when it is at its most sensitive. Earlier research characterized OF, but information on its lipid composition is scarce. Specifically, non-esterified fatty acids (NEFAs) are highly relevant, as they are typically upregulated during lipolytic disorders and were shown to hamper *in vitro* embryo development. Therefore, using a novel *ex vivo* approach, we investigated whether and to which extent plasma NEFAs are reflected in OF.

Plasma and OF from 49 Belgian Blue cows in the early luteal phase were sampled. Blood samples were obtained during exsanguination, and OF was collected using a method combining flushing and application of mechanical pressure. A tracer molecule, amaranth, was used to correct for differences in OF dilution, and post sampling glycolysis was inhibited with sodium fluoride. Plasma and OF NEFA concentrations were photometrically analysed. Data were expressed as mean \pm SD, and analysed using Pearson correlation and paired student's t-testing. Plasma and OF NEFA concentrations were 0.31 \pm 0.14 and 0.29 \pm 0.19mmol/l, respectively. Plasma and OF NEFAs were not significantly different ($P=0.13$), however, there was a trend for positive correlation (Pearson correlation coefficient=0.56; $P=0.07$). Results indicate that NEFAs occur in OF at concentrations seen in plasma of healthy cattle. Furthermore, data suggest that elevated plasma NEFAs may alter the embryonic environment in the oviduct during maternal lipolytic disorders, which may contribute to the pathology of sub- and infertility.