

## A focus on fatty eggs and fertility

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A new study of fat levels in oocytes (immature ova or eggs) has the potential to transform IVF practice, benefiting the dairy industry, and women seeking assisted reproductive treatment too.

The three year study, published in the journal *Biology of Reproduction*, established that high levels of fat in the oocytes of high milk-yield dairy cows, impacted both egg and [embryo development](#) negatively, reducing overall success rates of fertility. Treating these fatty oocytes with the drug salubrinal, reversed these negative outcomes.

Lead author on the paper, Dr Mel McDowall, senior researcher at the Centre for Nanoscale BioPhotonics (CNBP) and the University of Adelaide's Robinson Research Institute, believes that the findings have the potential to revolutionize the IVF industry.

"What we've shown is that fatty eggs affect the fertility process negatively. These eggs behave differently when they contain higher levels of fat - that they exhibit a particular stress, reduce the health of the eggs and subsequent embryo development. We've been able to block that stress mechanism, in this instance with salubrinal, to improve egg quality and to get the embryo back to within normal quality parameters."

Dr McDowall believes that the study can help stem the decline of high milk-yield cattle fertility rates - a decline of approximately 20% over the past 20 years.

"In Australia a 1% decrease in Holstein cattle fertility equates to

approximately \$5m in lost revenue per year. Our new approach, as part of a structured IVF process, has the potential to give the Australian dairy sector a real boost," said Dr McDowall.

Dr Rebecca Robker, from the University of Adelaide's Robinson Research Institute and a senior author on the study, noted that the research also offered a potential new approach for [women](#) undertaking IVF.

"What we know is that obese women (with BMIs over 30) also have fatty oocytes and this can be a key cause of infertility. The use of an agent such as salubrinal could potentially benefit large numbers of women seeking IVF treatment in the future."

Concluded Dr McDowall, "Our research is aimed at improving reproductive outcomes for all, whether it be the 9% of women in Australia experiencing fertility issues, or the dairy cow in the field."

**More information:** M. L. Sutton-McDowall et al. Non-Esterified Fatty Acid-Induced Endoplasmic Reticulum Stress in Cattle Cumulus Oocyte Complexes Alters Cell Metabolism and Developmental Competence, *Biology of Reproduction* (2015). [DOI: 10.1095/biolreprod.115.131862](https://doi.org/10.1095/biolreprod.115.131862)

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