

# Birds require multiple sperm to penetrate eggs to ensure normal embryo development

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A first-year Penn State College of Information Sciences and Technology doctoral student spent four months observing birds in an effort to learn what it would mean to design technologies from a more-than-human perspective. Her autoethnographic study contributes to addressing the challenging research problem of how to operationalize posthuman concepts into practice for human-computer interaction. House finchnigel. Credit: Wikimedia Commons

Birds require multiple sperm to penetrate eggs to ensure normal embryo development

- One sperm is not enough to ensure normal embryo development in [birds](#)
- Female birds can control the number of sperm that make it to the egg

Unlike humans, birds require multiple sperm to penetrate an egg to enable their chicks to develop normally.

A new study by scientists at the University of Sheffield revealed there is a functional role for 'extra' sperm in the early stages of embryo development.

This is very different to humans and other mammals where the entry of more than one sperm into an egg is lethal.

Researchers also discovered female birds are able to regulate the number of sperm that make it to the egg, ensuring that sufficient sperm are available for fertilisation - particularly when the numbers of inseminated sperm are limited.

The study, led by Dr Nicola Hemmings from the University's Department of Animal and Plant Sciences, gives an insight into the biological significance of polyspermy which is a major puzzle in reproductive biology.

It has been a long-standing question in the natural world whether the extra sperm that enter a bird's egg have any role to play in fertilisation or early embryo development.

The pioneering research shows that when very few sperm penetrate a

bird's egg, the embryo is unlikely to survive.

Dr Hemmings explained: "Our research shows that, in contrast to humans and other mammals, one sperm is not enough to ensure normal [embryo development](#) in birds.

"When just a single sperm enters the bird egg, fertilisation may occur normally, but the resulting embryo will probably die at a very early stage. This is surprising because when more than one sperm enters the human or mammalian egg - a process we call polyspermy - the egg is destroyed.

"Polyspermy has generally been considered to be bad for reproduction, but our results suggest that, in certain animal groups, polyspermy may in fact be necessary."

The research is published today (Wednesday 28 October 2015) in the journal *Proceedings of the Royal Society B*.

Dr Hemmings added: "These findings provide an exciting expansion of our view of the sperm's role in fertilisation. It is fascinating to speculate how the 'extra' [sperm](#) contribute to the early stages of [embryo formation](#) and development."

**More information:** Polyspermy in birds: sperm numbers and embryo survival, [rspb.royalsocietypublishing.org/.../1098/rspb.2015.1682](http://rspb.royalsocietypublishing.org/doi/10.1098/rspb.2015.1682)

Provided by University of Sheffield

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