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News Release

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Bird breeds at risk may benefit from chicken cell study

Rare bird breeds that are at risk could be saved from extinction thanks to new research.

Researchers have devised a better formula for growing primordial germ cells – the cells that give rise to sperm and eggs – from chickens.

The technique could be used to freeze stocks of these specialised cells from rare chicken breeds, so that they can be brought back to life in the event of extinction.

It will allow researchers to create a biobank to preserve rare breeds for future generations.

The findings from the University of Edinburgh's Roslin Institute could also aid efforts to generate chickens that are more resilient to disease using advanced new gene-editing techniques.

Chickens are one of the most important agricultural species with more than 59 billion bred each year for meat and egg production.

There are hundreds of chicken breeds but many face dying out in favour of more lucrative commercial breeds that dominate the livestock industry.

Experts are keen to preserve rare breeds because they may carry useful genetic information that makes them resistant to existing – and future – diseases. These genes could be bred into farmed chickens to improve their resilience to disease.

Rare chicken breeds may also carry genes that enable them to thrive in different environments. Breeding these genes into commercial breeds could help farmers improve the productivity of their stock in the face of a changing climate.

Unlike cells from mammalian livestock species, eggs from birds cannot be preserved by freezing.

Primordial germ cells are a type of stem cell found in the very early embryo. They give rise to germ cells, which produce semen and eggs.

The Roslin team has identified the factors that are needed to grow primordial germ cells from chickens in the laboratory, without the need for blood products. The new approach is more reliable than previous methods and has a lower risk of passing on disease.

The study is published in the journal *Stem Cell Reports*. It was funded by the Biotechnology and Biological Sciences Research Council.

Dr Mike McGrew, Group Leader at The Roslin Institute, University of Edinburgh, said: “This research marks a major step forward in our ability to preserve rare bird breeds.

“It also opens the door to using gene-editing techniques in birds, which could help us to produce birds with greater disease resistance. It is a significant advance in our quest to safeguard the food chain in the face of a changing climate.”

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