

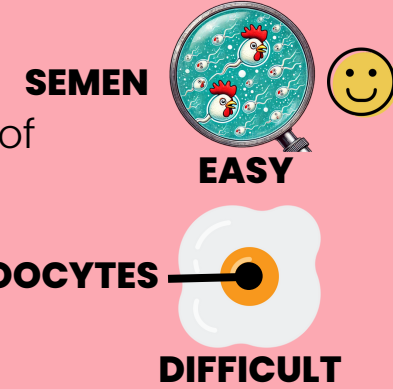
THE POWER OF PGCs/GGCs: A BREAKTHROUGH FOR FEMALE POULTRY CONSERVATION

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DO YOU KNOW HOW DIFFICULT CHICKEN CONSERVATION CAN BE?

- Rooster semen is easy to freeze.
- The conservation of hen oocytes is extremely difficult and not currently practiced



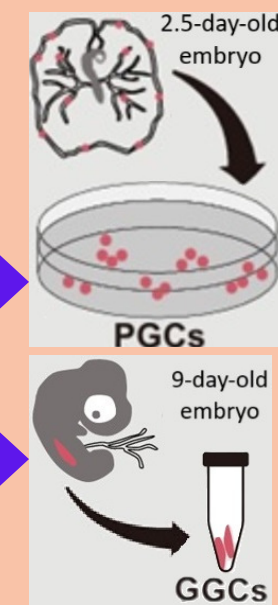
BUT THERE IS AN ALTERNATIVE FOR HENS!

- Preserving their Primordial Germ Cells (PGCs) or Gonadal Germ Cells (GGCs)!



WHAT ARE PGCs AND GGCs?

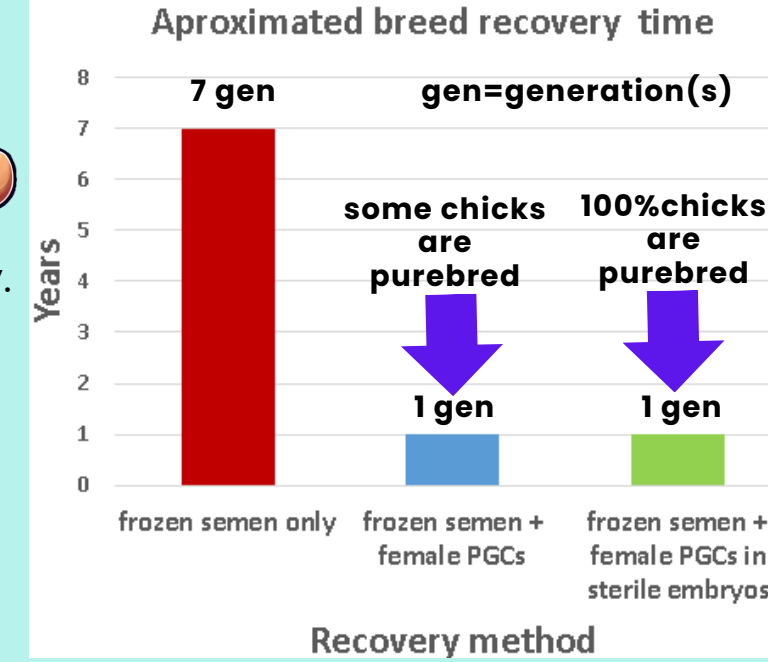
- PGCs and GGCs are embryonic cells that later develop into sperm or oocytes
- PGCs are present in the blood of 2.5-day-old chick embryos.
- GGCs are present in the testis or ovaries of 9-day old chick embryos.



Note: A chick takes 21 days to fully develop

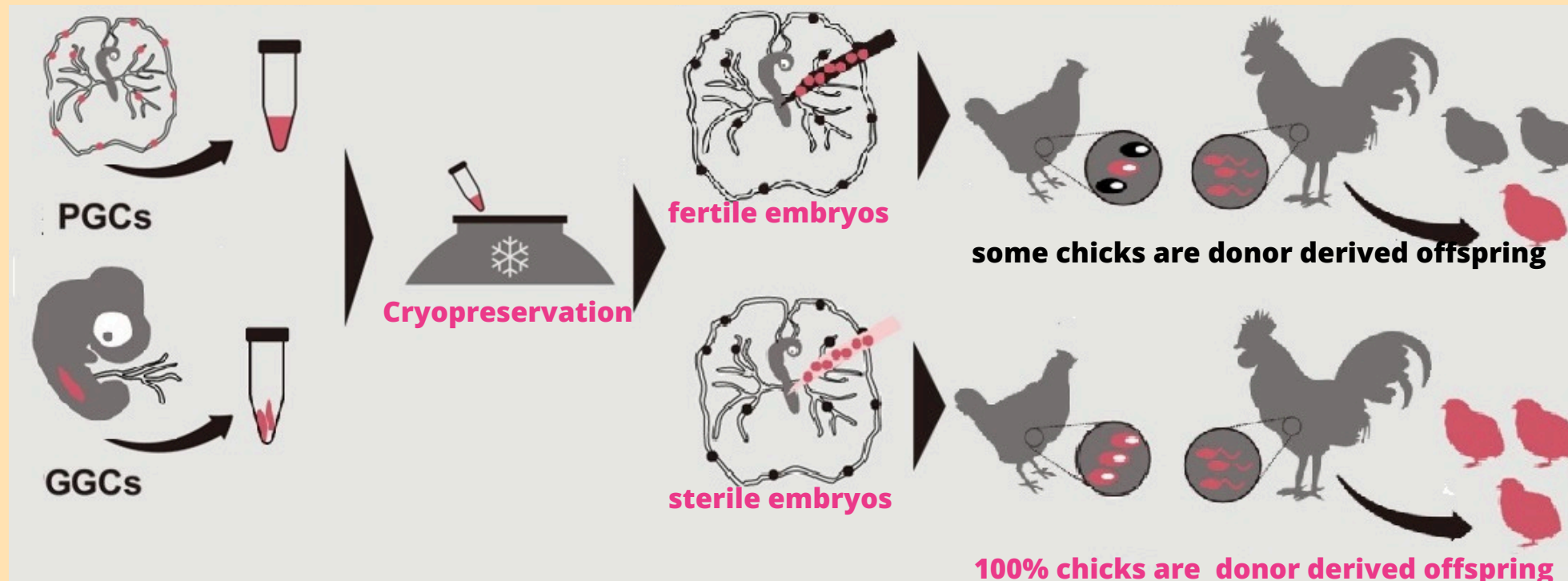
WHY PRESERVE PGCs/GGCs?

- ✓ To preserve hen reproductive cells.
- ✓ Faster breed recovery.
- ✓ To preserve rare chicken breeds without needing to keep large female flocks alive.



HOW DOES IT WORK?

- Scientists collect PGCs/GGCs from donor female chicken embryos and freeze them.
- Later, these cells are placed into embryos of a different breed, which grow into hens.
- These hens lay eggs from the donor and their own.



Adapted from Ichikawa, K., & McGrew, M. J. (2024). Innovations in poultry reproduction using cryopreserved avian germ cells. *Reproduction in Domestic Animals*, 59, e14591. <https://doi.org/10.1111/rda.14591>

- If we fertilize these eggs with semen from a rooster of the donor breed, some chicks will be purebred (of the donor) –even though they were laid by a different breed of hen!. The donor breed is thus recovered!

A DIFFICULT CHOICE, BUT A MEANINGFUL ONE

- PGCs and GGCs are only accessible in early embryonic stages and the embryo cannot survive.
- By selecting only necessary donor embryos and following ethical guidelines, this sacrifice ensures the long-term survival of entire breeds or even species.



Note: If we use sterile surrogate embryos that do not produce their own PGCs/GGCs, 100% of the first-generation offspring will be purebred from the donor

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