

Reproduction in Animals



Reproduction

Reproduction is the biological process by which organisms produce offspring, ensuring species survival. It occurs in two forms:

Modes of Reproduction

- ➔ **Sexual Reproduction:** Involves two parents, with male and female gametes combining to form offspring that inherit traits from both.
Example: Human reproduction.
- ➔ **Asexual Reproduction:** Involves a single parent, producing genetically identical offspring.
Example: *Hydra* reproducing by budding.

Dolly — The First Cloned Mammal

- ➔ First mammal cloned from an adult body cell
- ➔ **Born:** 5th July 1996 at Roslin Institute, Edinburgh, Scotland
- ➔ **Announced:** 22nd February 1997
- ➔ **Died:** 14th February 2003 (aged 6)
- ➔ **Lead Scientist:** Sir Ian Wilmut

How was Dolly formed?

- ➔ **Technique:** Somatic Cell Nuclear Transfer (SCNT)
- ➔ **Step 1** - Mammary gland cell taken from Finn Dorset white sheep (DNA donor)
- ➔ **Step 2** - Nucleus removed from egg cell of Scottish Blackface sheep (enucleated egg)
- ➔ **Step 3** - Both cells fused using mild electric shock
- ➔ **Step 4** - Fused cell developed into embryo in laboratory
- ➔ **Step 5** - Embryo implanted into surrogate mother's uterus
- ➔ **Step 6** - Surrogate mother gave birth to Dolly - genetically identical to DNA donor

Human Reproductive System

Male Reproductive System

- ➔ **Testes:** Produce sperm and testosterone.
- ➔ **Sperm Ducts:** Transport sperm.
- ➔ **Penis:** Transfers sperm.
- ➔ **Testosterone:** Regulates sperm production and male secondary sexual traits.

Sperm:

- ➔ Male gamete, produced in testes.
- ➔ Consists of a head (genetic material), middle piece (mitochondria for energy), and tail (for movement).
- ➔ Can swim, aiding fertilization.

Female Reproductive System

- ➔ **Ovaries:** Produce eggs and hormones.
- ➔ **Fallopian Tubes:** Transport eggs to the uterus.
- ➔ **Uterus:** Supports embryo development.

Oestrogen: Regulates reproductive organ development, menstrual cycle, and secondary sexual traits.

Ovum (Egg Cell):

- ➔ Produced in ovaries.
- ➔ Larger than sperm, non-motile.
- ➔ Moves to the uterus via fallopian tubes.

Fertilisation

- ➔ Sperm fuses with an egg in the fallopian tube, forming a **zygote**.
- ➔ The zygote undergoes cell division and develops into an **embryo**.
- ➔ Ensures genetic inheritance and variation.
- ➔ Types of fertilisation:
 - **Internal fertilisation:** Fusions take place inside the female's body. E.g., Human, cow, dog etc.
 - **External fertilisation:** Fusion takes place outside the female's body. E.g., Aquatic animals like fish, starfish etc.

Development of Embryo

- ➔ Embryo get implanted in the wall of uterus for later development.
- ➔ It gradually develops body parts and identified as **foetus**.

Viviparous and Oviparous animals

Viviparous animals: Give birth to young ones. E.g., Humans.

Oviparous animals: lay eggs which later develop into young ones. E.g., Hens, fish, frogs.

Types of Asexual Reproduction

- ➔ **Fission:** A single-celled organism splits into two identical cells.
 - **Example:** *Amoeba* (binary fission).
 - **Multiple fission:** One parent cell produces many daughter cells.
- ➔ **Budding:** A small growth (bud) forms on the parent and develops into a new organism.
 - **Example:** Yeast (attached buds), *Hydra* (detached buds).