Chapter- 9 Reproduction in Animals





Sexual Reproduction

Reproduction is a process in which an organism reproduces its same kind. The offspring produced are similar to the parents. Reproduction is essential for the continuation of a species.

Reproduction in animals takes place by two modes



Sexual Reproduction

Sexual reproduction involves the participation of male and female reproductive system. Like plants, animals also produce male and female gametes which fuse to form a zygote. This zygote then develops into a baby.

Male Reproductive Organs

The male reproductive organs include

- > A pair of testes
- Ejaculatory duct
- Seminal vesicle
- > Epididymis
- > Penis

The testes produce the male gametes called **sperms**. These are produces in millions. The sperm is a single cell with all cellular components. A single sperm is divided into, the head, middle piece and the tail. These sperms are motile and require a lot of energy for their



passage. They have several mitochondria. These mito generate energy.

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Female Reproductive Organs

It includes

- > A pair of ovaries
- Oviducts or the fallopian tubes
- ➢ Uterus

Like the testes in males the ovary produces female gametes called **ova or eggs**. In human beings, unlike male, the female produces a single matured egg into the oviduct by one of the ovaries every month. If it fuses with the sperm it becomes a zygote and if it doesn't fuses, it dies after one day.



Female reproductive organs



Fertilisation

The male gamete that is the sperm and the female gamete that is the ovum fuse to form a zygote. This process is called as fertilisation. The zygote is a single cell formed by the fusion of one sperm and ovum.

The zygote then divides and develops into an embryo which later forms the foetus. The foetus has characteristics of both male as well as female parent.

Types of fertilisation

Fertilisation may occur inside the body of an organism or outside.

Internal fertilisation

In mammals like cow, dog and humans the fertilization is internal that is the eggs are fertilized within the female reproductive tract. The sperm needs fluid to swim to the egg. The chances of fertilisation are much greater since the gametes are closer together when released.

External fertilisation

In frogs, fishes and starfish the eggs are released outside the body. The female lays hundreds of eggs. In frogs these are coated with a layer of jelly which protects it. The sperms are motile, they swim and reach the egg and fertilizes it forming a zygote. This type of fertilization is called as external fertilisation.

Development of Embryo

Fertilisation results in the formation of zygote which begins to develop into an embryo. The zygote divides repeatedly to give rise to a ball of cells. The cells then begin to form groups that develop into different tissues and organs of the body. This developing structure is termed an embryo. The embryo gets embedded in the wall of the uterus for further development. The



embryo continues to develop in the uterus.

Development of Embryo



It gradually develops the body parts such as hands, legs, head, eyes, ears, etc. The stage of the embryo in which all the body parts can be identified is called a **foetus**. When the development of the foetus is complete, the mother gives birth to the baby.

Viviparous and Oviparous Animals

In hens the fertilisation is internal but there is difference in the development of the embryo. The hen lays eggs unlike humans and cows. The eggs of the hen are shielded with a hard shell that protects it. After providing enough warmth by the hens the chick grows completely and the egg hatches. Such animals are called as **oviparous**.

Mammals like cows and humans which give birth to their young ones are called as viviparous. The foetus in mammals develops on the uterus wall. Such animals are called as viviparous.

Young Ones to Adults

The transformation of the larva into an adult through drastic changes is called **metamorphosis**. There are three distinct stages in the life cycle of a frog, that is,

Egg \rightarrow Tadpole (larva) \rightarrow Young frog \rightarrow Adult



Metamorphosis in Frog

Invitro Fertilisation

When the sperm is not able to reach egg for fertilization, another technique is used where the fertilization is done under experimental conditions. Doctors collect freshly released egg and sperms and keep them together for a few hours for *IVF* or *in vitro fertilization*. In case fertilization occurs, the zygote is allowed to develop for about a week and then it is placed in the mother's uterus. Complete development takes place in the uterus and the baby is born like any other baby. Babies born through this technique are called test-tube babies.



Asexual Reproduction

Reproduction which involves only a single parent is called asexual reproduction.

Budding in Hydra

Hydra produces small bulges from the sides of its body. These bulges grow as buds and separate from the parent body. Since new individuals develop from the buds in hydra, this type of asexual reproduction is called budding.

Binary fission in Amoeba

The amoeba which is a single celled organism divides by another method called binary fission. The nucleus of an amoeba cell divides into two nuclei after which the cytoplasm divides into two, each part receiving a nucleus. Finally, two amoebae are produced from one parent amoeba.



Budding in Hydra



Binary fission in Amoeba



Cloning

Cloning is the production of an exact copy of a cell, any other living part, or a complete organism. The first organism that was produced by cloning was a sheep named dolly.

During the process of cloning Dolly, a cell was collected from the mammary gland of a female Finn Dorsett sheep. An egg was obtained from a Scottish blackface ewe. The nucleus was removed from the egg. Then, the nucleus of the mammary gland cell from the Finn Dorsett sheep was inserted into the egg of the Scottish blackface ewe whose nucleus had been removed. The egg thus produced was implanted into the Scottish blackface ewe. Development of this egg followed normally and finally Dolly was born. Dolly was identical to the Finn Dorsett sheep from which the nucleus was taken.



