



Puberty and Sexual Maturity

Puberty is defined as the age at which the female or male gonads become capable of releasing the gametes (Oocytes or Spermatozoa).

Puberty in females is defined as the age at the first expressed estrus with ovulation.

It should not be considered sexual maturity.

If animals are bred at puberty, a high percentage will have difficulty with parturition.

Sexual maturity

The female become capable for insemination and pregnancy.

Puberty occurs when gonadotropins (FSH and LH) are produced at high enough levels to initiate follicle growth, oocyte maturation, and ovulation.

When they approach adult levels, they stimulate resumption of oocyte maturation and ovulation occurs.

Age at puberty is affected by both genetic and environmental factors.

Genetic factors can be seen by comparing or breeds within a species.

Average age at puberty is:

7 to 18 months for cows (**Maturity: 30 months**)

4 to 5 months for does (**Maturity: 6-8 months**)

7 to 10 months for ewes (**Maturity: 12-18 months**)

12 to 24 months for mares (**Maturity: 36 months**)

A number of environmental factors have a pronounced effect on age at puberty.

In general, any factor which slows growth rate, thus preventing expression of full genetic potential, will delay puberty.

High environmental temperature delays puberty.

Age at puberty in sheep and goats is affected by months of birth because it affects their age at the onset of their breeding season.

For example, ewes born in January will be older at puberty than those born in March.

Other environmental factors that might delay puberty include poor health and poor sanitation in rearing facilities. While adverse environments delay puberty and reduce the mature size of animals, weight at puberty is not greatly affected.

Feeding above recommended levels will result in earlier puberty.



Seasonality

Most wild species have a breeding season that is initiated at a time when the environment will allow for the best survival of the young at their birth.

These patterns have developed through natural selection over many generations.

Patterns of seasonal breeding range from species that have one period of estrus each year (Monoestrous) to species that have a series of estrous cycles limited to a portion of year (seasonally polyestrous).

In temperate climates many species are seasonal breeders.

Sheep, goats and horses are examples of them.

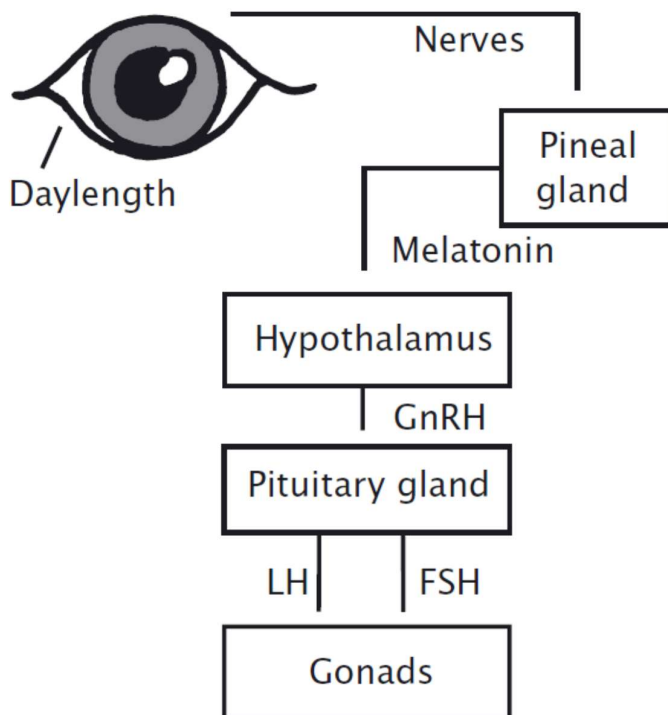
This means that periods of sexual activity (the estrous season) are alternated with periods of sexual inactivity (the anestrus season).

In sheep, sexual activity starts when the day length shortens (short-day breeders), and in horses sexual activity starts when day length increases (long-day breeders).

The difference in breeding season between species is connected with the differences in gestation length.

In temperate and cold climates the result is that both horses and sheep give birth to their young in spring, a period with sufficient food, giving them the best chance of survival.

The pineal gland is the main regulatory organ in seasonality. Via the eyes and complex neural connections day length is registered in the pineal gland.



The pineal gland produces indoleamines of which melatonin is the most important.

Melatonin is produced and secreted during the night (dark).

When days become shorter the exposure of the animal to melatonin increases. This has a stimulating effect on the GnRH secretion by the hypothalamus in short-day breeders like sheep.

In long-day breeders (horse) the increased exposure to melatonin during long nights (short days) inhibits the GnRH release by the hypothalamus. In this way the day length differences are recognized and translated into signals that turn on or turn off sexual activity.

