Puberty and sexual maturity

Puberty:

is the age in postnatal life when gonads produce gametes and sex hormones in sufficient quantities to enable an animal to reproduce.

It is not a sudden event, but a gradual process of maturation of the endocrine and reproductive systems enabling the animal for successful reproduction .

Puberty should not be considered **sexual maturity**. If animals are bred at puberty, a high percentage will have difficulty with parturition.

Sexual maturity occurs when the female become capable for insemination, pregnancy and normal parturition.

Hypothalamus plays a very important role in regulation of onset of puberty. The onset of puberty was dependent on many factors like genotype, nutrition, season, social, climate and disease.

The fundamental requirement for pubertal onset is the secretion of GnRH at the appropriate frequency and quantities to stimulate gonadotropin release by the anterior pituitary lobe. Gonadotropins will promote gametogeneseis, steroidogenesis and the development of reproductive tissues.

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

The reason for the 'silent' first oestrus of the pubertal animal is believed to be because the cen tral nervous system requir be primed with progesterone before it will respond and the animal will show behavioural signs of heat.

The first ovulatory cycle has been shown to be short in pubertal heifers (7.7 +/– 0.2 days), and the first corpus luteum (CL) not only has a shorter than normal life span but is also smaller in size. The subsequent interovulatory interval was normal.

External factors influencing the time of onset of puberty

The time of onset of puberty is determined by the individual's genotype, with smaller breeds of animal tending to be slightly more precocious. However, this inherent timing is influenced by a number of external factors.

Nutrition :

There is good evidence that in most domestic species, the age of puberty is closely related to body weight; therefore, it is not surprising that nutrition is an important factor.

Animals that are well fed with good growth rates reach puberty before those that are poorly fed with slow growth rates. However, unless the animal is severely malnourished, the onset of cyclical activity will eventually occur.

Season of the year :

In those species which are seasonal breeders, such as the ewe, mare and queen cat, the age at which puberty occurs will be influenced by the effect of season of the year. For instance, a filly born early in the year, i.e. January or February, may have her first oestrus in the May or June

of the following year, i.e. when she is 16 or 17 months old. A filly foal born late in the year, July or August, may not have her first oestrus until she is 21 or 22 months old. The same is true of ewes which, depending upon the time of year at which they are born, may reach puberty as early as 6 months or as late as 18 months old.

Proximity of the male:

Studies in sheep and pigs have shown that exposure to the male of the species will advance the timing of the onset of puberty.This so-called 'ram or boar effect' is probably mediated by pheromonal and other sensory cues influencing hypothalamic GnRH secretion.

Climate:

Anthropomorphic extrapolation has assumed that animals living in the tropics reach puberty at an earlier age than those in temperate climates. Studies carried out in Zambia have shown that in cattle this is not true.

Disease:

Any disease which can influence the growth rate, either directly or because of interference with feeding and utilisation of nutrients, will delay the onset of puberty**.**

Females of domestic species reach the age of puberty at the following times:

- mare: 1–2 years
- cow: 7–18 months
- ewe: 6–15 months
- doe or nanny goat: 4–8 months
- sow: 6–8 months
- bitch: 6–20 months
- queen cat: 7–12 months