Acclimation & Acclimatization to hot environment

- **Acclimation & Acclimatization for heat & hot environment show similar changes & hence considered together.**
- **When skin heat receptors feel heat they lead to reflex responses which include**

i) Dilatation of cutaneous blood vessels to increase blood flow in the skin so that heat is given away.

ii) Sweating increases.

iii) If Sweat glands are absent (birds) then evaporation from respiratory surface rises.

- **All these processes cause evaporation of water & hence cooling.**
- **In man in cool air 1 litre water/day is evaporated from body surface.**
- **Rise by 1^0 C rises water evaporation at a rate 20 ml/hr.**

- **Donkeys & camels live in desert environment where ta is high.**
- **In them to save water sweating start late or at higher temp.**
- **It starts between 31-35^{0}C temp.**
- **As a result the organism has to tolerate hyperthermia.**

- **The stimulus for sweating is different in different animals.**
- **In some exposure to sun causes sweating.**
- **In female sheep sweating is stimulated when mammary glands are heated,**
- **In male sheep sweating is stimulated when scrotal sac skin is heated.**
- **In general sweating causes evaporative heat loss.**

- **However birds don’t have sweat gland & hence they show evaporation from respiratory surface , for which they show-**

Ex. : Gullar flutter – Pigeon, Storks
Panting – hawk, pigeon etc.
Fluffing of feathers – Ostrich, Pigeon, sparrows.
Dusting of feathers or dust bath – sparrow, ostrich.
This is how they try to achieve cooling.

- **Desert birds soar high in the air & enjoy cool air currents.**

- **A bird ‘Bobby’ spreads the wings & keeps legs under shadow so that cooling is achieved.**

- **Stork urinates on the leg or shows panting & this stops when it enters water.**

- **In mammals respiratory surface evaporation is raised.**
- **In cows pulmonary evaporation rises 3 fold when temp. rises to 68^0F to 111^0F.**
- **Dogs & cats show panting.**
- **In goats horns play important role in cooling.**

- **If horns are covered by woollen cap the goat dies because of rised brain temp.**

- **In human beings, also when a person is heat acclimated certain physiological modifications are seen.**

- **capacity of sweating is doubled.**
- **sweating starts earlier.**
- **sweat contains less salt.**
- **efficiency of cardio vascular system rises.**