GENERAL ANIMAL MEDICINE COURSE BY: PROF MOHAMED GHANEM

ABNORMAL TEMPERATURE

- Fever
- Hyperthermia
- Hypothermia

FEVER (PYREXIA)

- Rise of core body temperature above normal limit independent to the effect of the ambient conditions.
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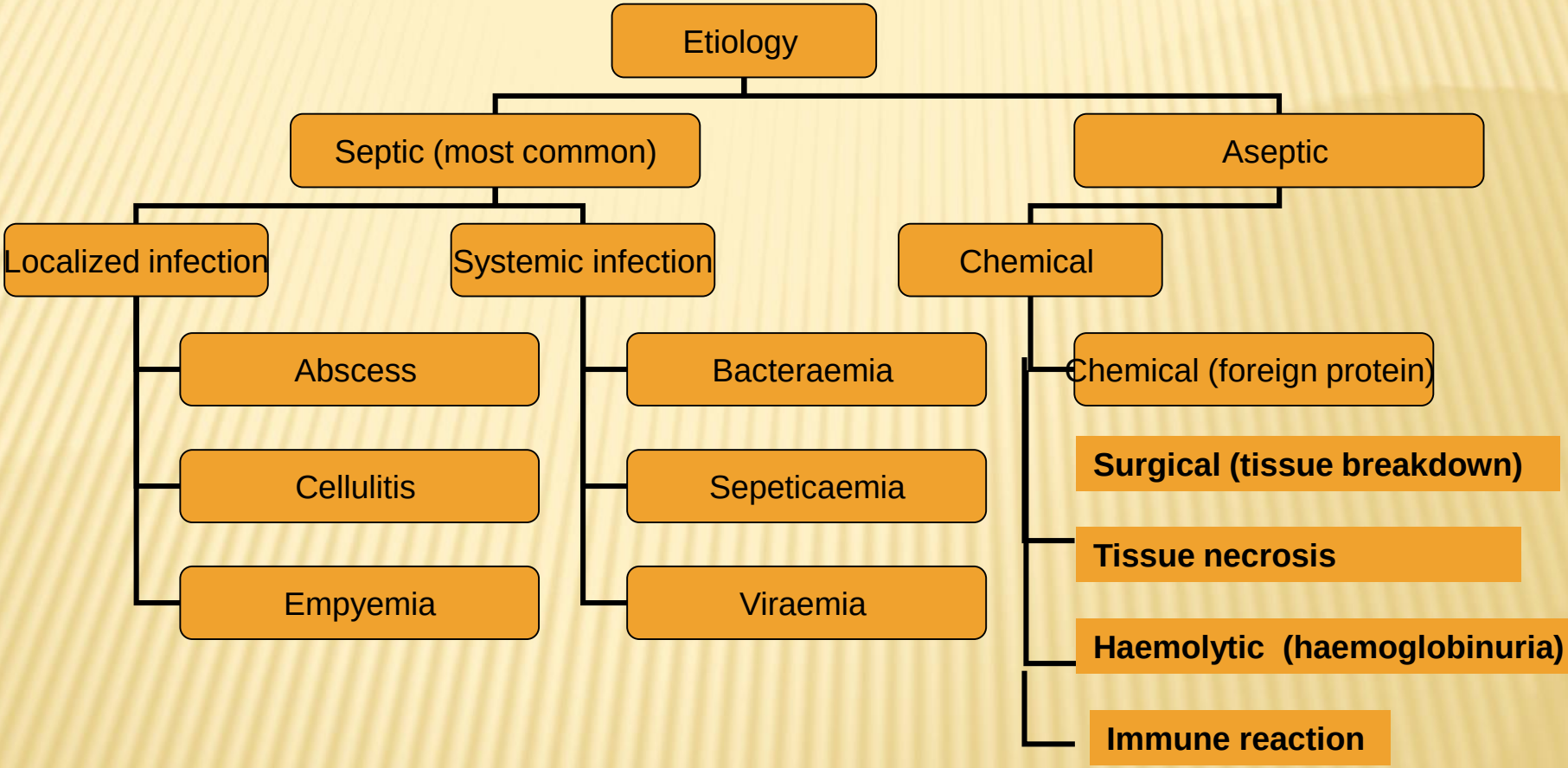
The normal temperature of different animals:

Animals	Range °C	Average	Animal	Range °C	Average
Horse (adult)	37.2 - 38	37.6	Camel	35 – 38.6	36.8
Foal	37.5 -38.5	38	Pig (adult)	37.8 -38.9	38.3
ox	37.8 – 39.2	38.5	Piglet	38.9 - 40	38.4
Calf	38.5 – 39.8	39.2	Small dog	38.6 -39.2	38.9
Sheep	38.9 - 40	39.5	Large dog	37.5 – 38.6	38
Goat	38.6 – 40.2	39.5	Guinea pig	37.5 – 39.4	38.4
Rabbit	39.9 – 40.5	39.8			
Cat	37.8 – 39.2	38.5			

ETIOLOGY OF FEVER



PATHOGENESIS OF FEVER

- Fever may be provoked by many stimuli. Most often, they are bacteria and their endotoxins, viruses, protozoa, immune reactions,
- These substances are commonly called exogenic pyrogens. Cells stimulated by exogenic pyrogens to produce cytokines called endogenic pyrogens.
- Endogenic pyrogens centrally affect the thermosensitive neurons in the hypothalamus increase the production of heat and decrease in heat loss
- The most important endogenic pyrogens are interleukins IL-1, IL-6 and the tumour necrosis factor- (TNF-) produced especially by monocytes and macrophages but also by endothelial cells

- Interleukin-1 initiates fever by increasing the synthesis of prostaglandins, especially PG E2 in the anterior hypothalamus.
- This raises the thermostatic set point and induces the mechanism of heat conservation and heat production until the blood and core temp. are elevated to match the hypothalamic set point.
- Therefore, antipyretics containing prostaglandin synthetase inhibitor lower fever by blocking the PG synthesis

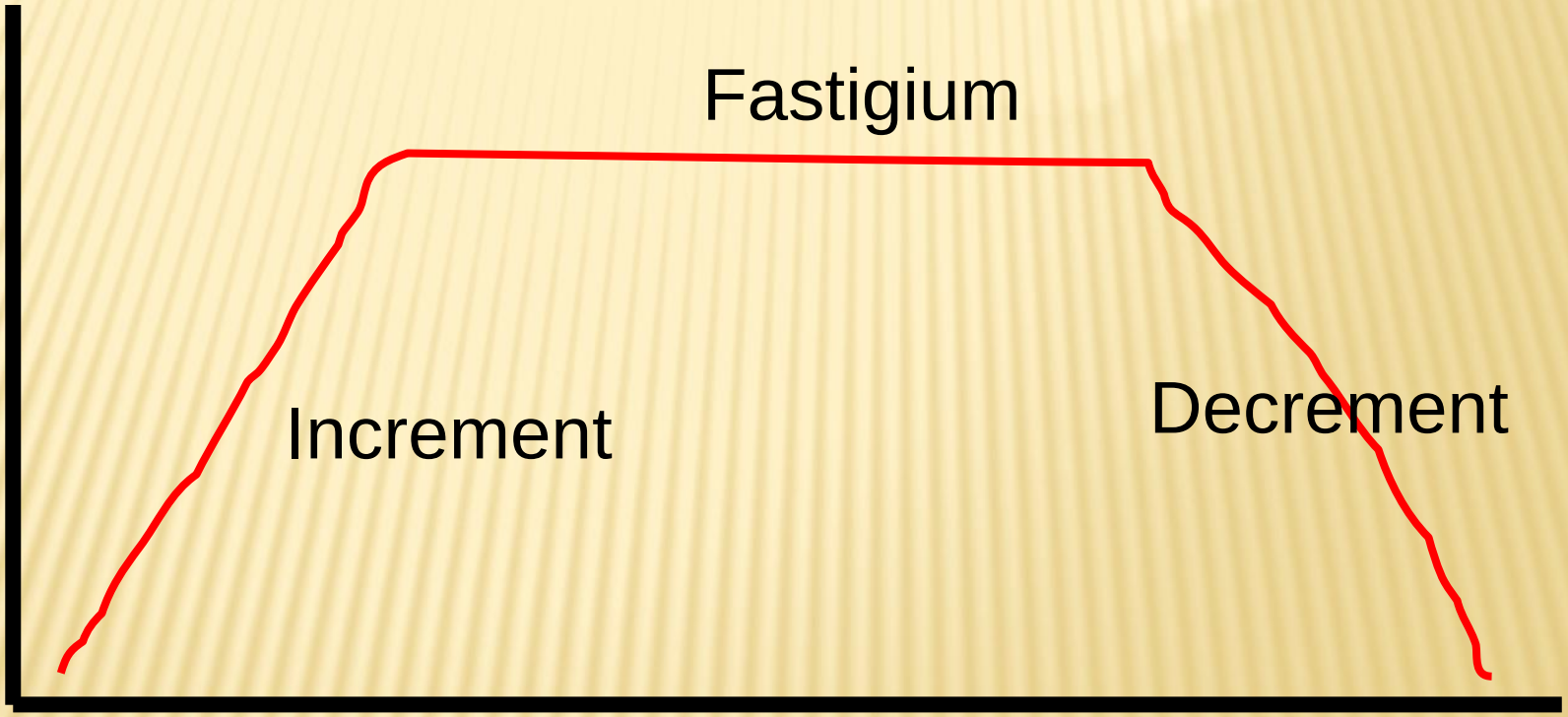
STAGES OF FEVER

- 1- increment stage
  - Cutaneous vasoconstriction
  - Absence of sweating
  - Cold skin and extremities
  - Reduced respiration
  - Muscle shivering
  - Reduced respiration
  - Oliguria
  - Rectal temperature is elevated

- 2- Fastigium stage (state of constant temperature)
  - The period of heat increment raises temperature to the new thermostatic level
  - Cutaneous vasodilation to dissipate heat
  - Severe sweating
  - Diuresis (increased urine production)
  - Decreased ruminal motility
  - Increased metabolism and tissue wasting

- 3- Decrement stage:
  - Excess heat is dissipated via
    - Vasodilatation
    - Sweating
    - Muscle falccidity
- If toxaemia is present, the ability of the tissues to respond to heat production or conservation may be lost and hypothermia may occur before death

STAGES OF FEVER



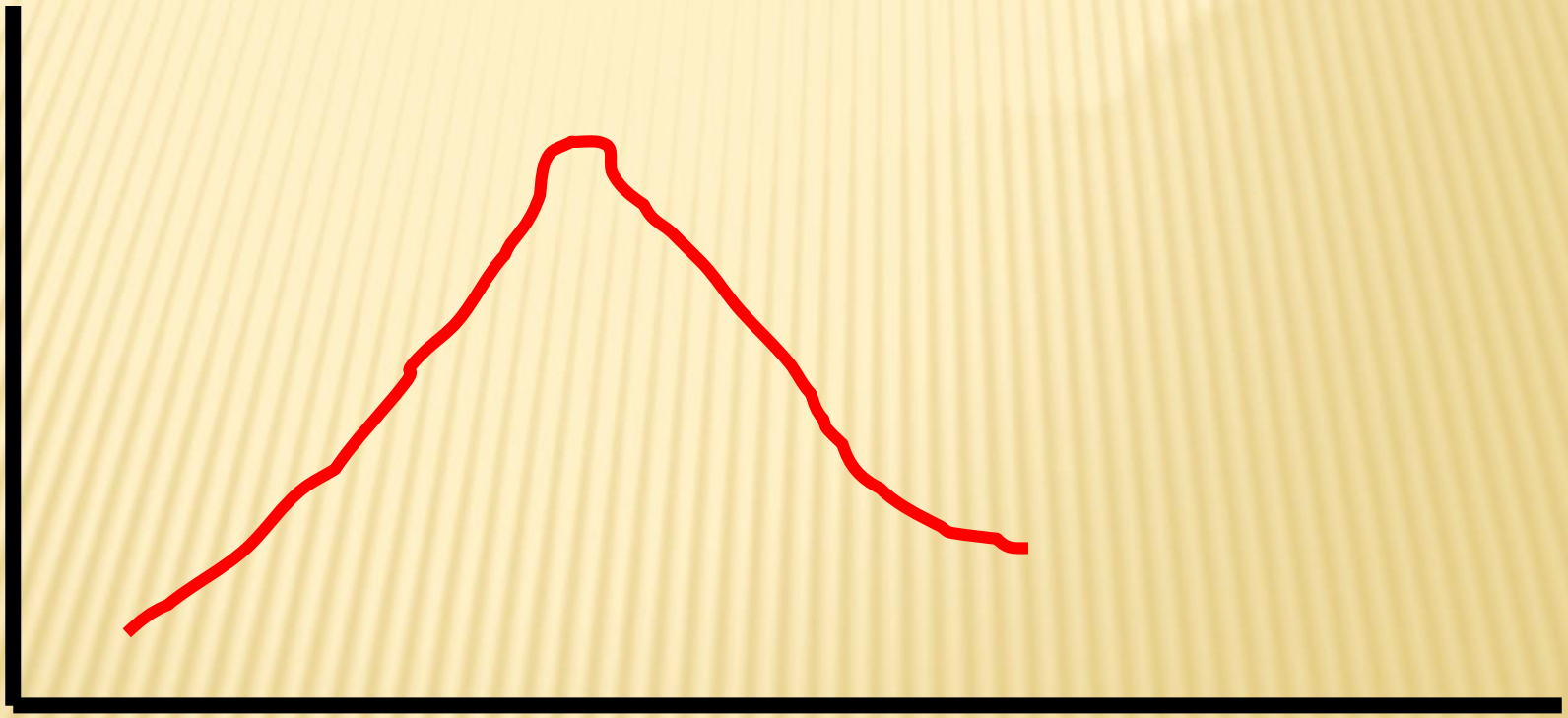
CLINICAL FINDINGS OF FEVER

- Elevation of body temperature
- Increased heart rate with diminution of pulse amplitude
- Hyperpnea (increased respiratory rate)
- Increased thirst
- Oliguria (reduced amount of urine) with sometimes albuminuria
- Scanty faeces
- Anorexia
- Depression and muscle weakness

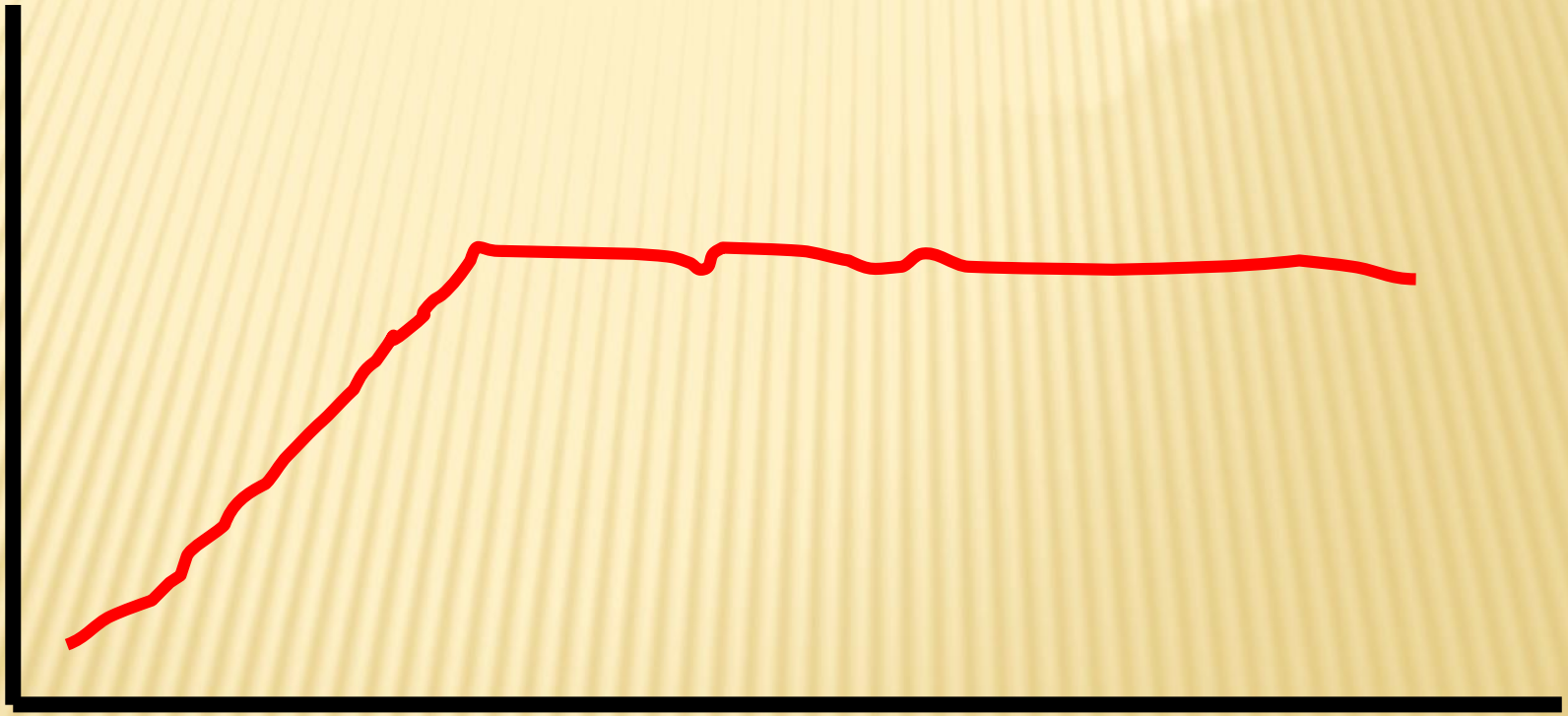
FORMS OF FEVER

- Transient : fever for short periods (hours)
- Continuous or sustained: without diurnal variations
- Remittent: with diurnal variation
- Intermittent when fever peaks last for 2-3 days and interspersed with normal period
- Recurrent fever: peaks of fever for about 6 days interspersed with equal period of normal temp.
- Atypical: when temperature variations are irregular

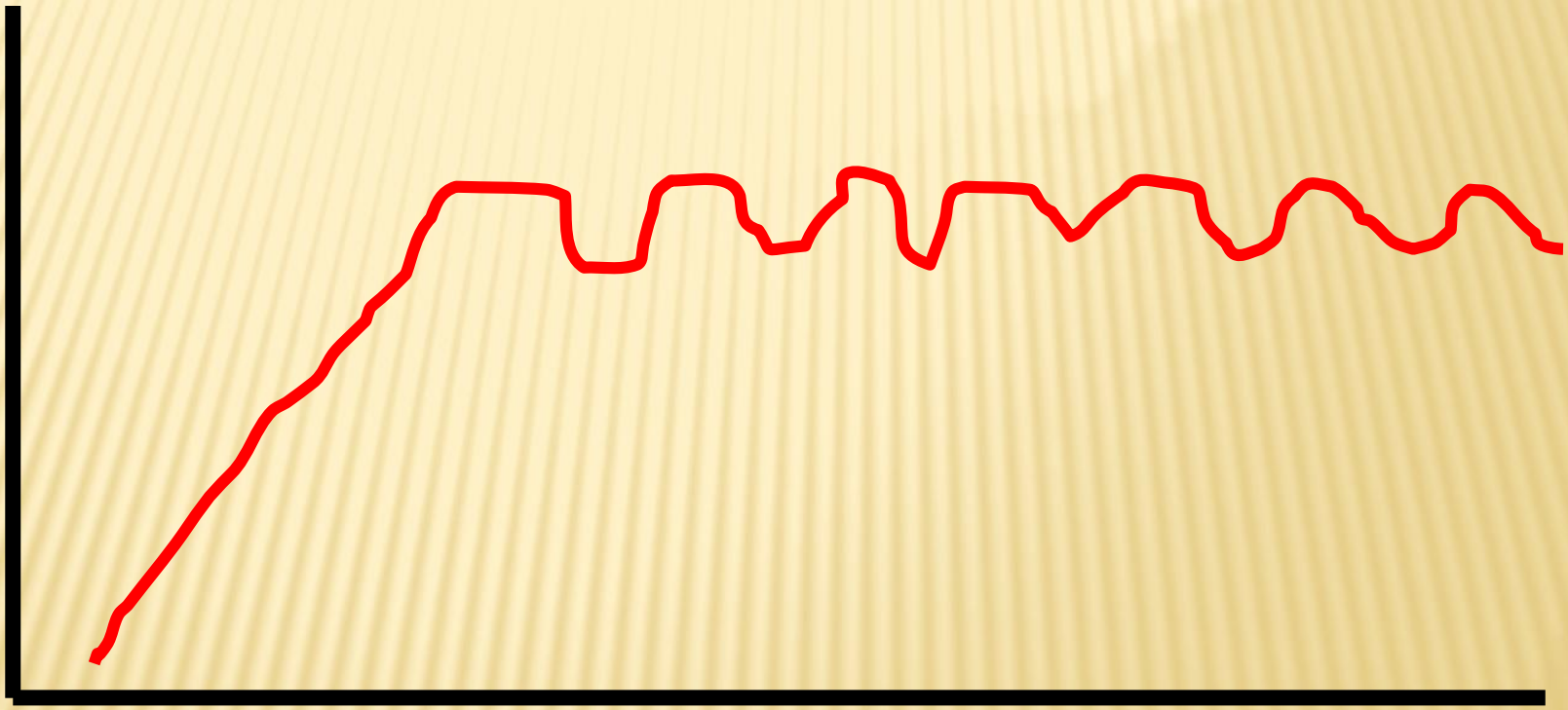
TRANSIENT FEVER OR SIMPLE FEVER



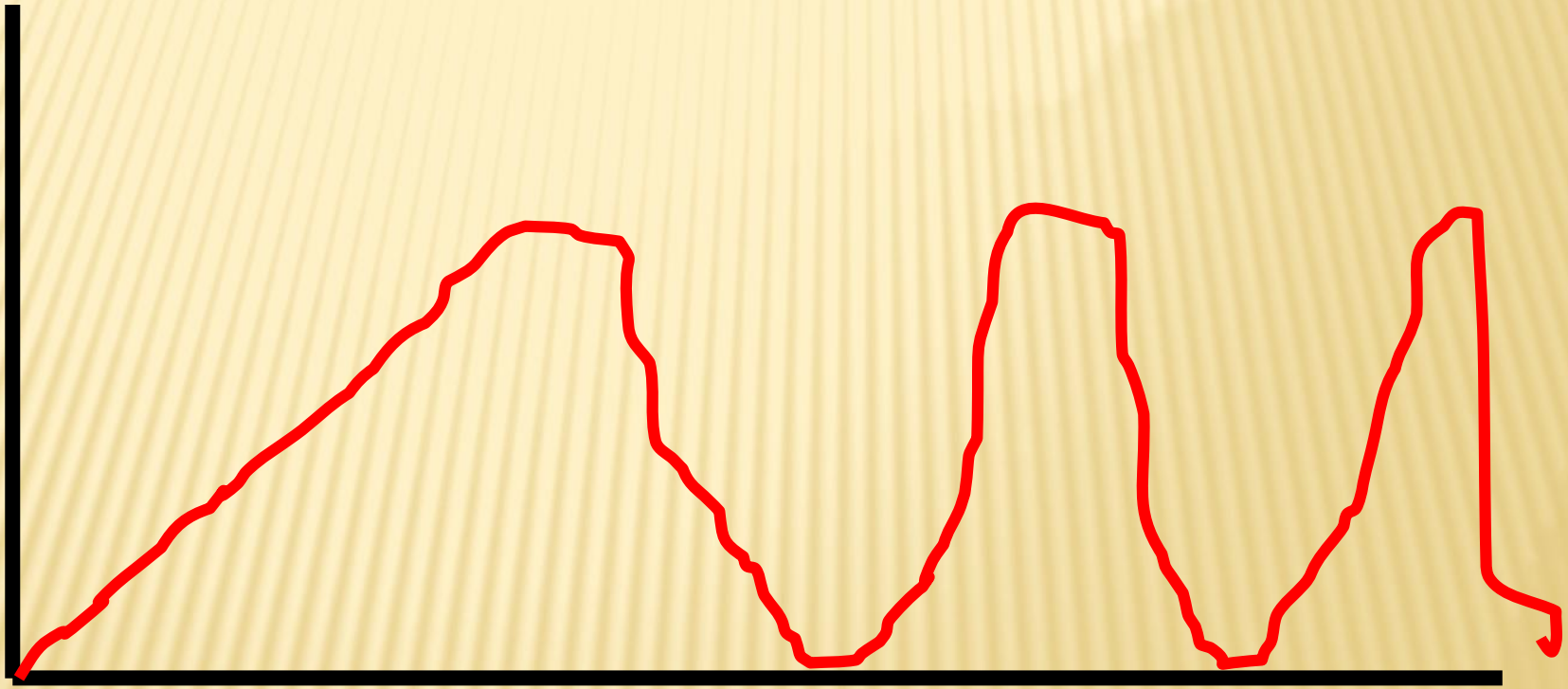
CONTINUOUS OR SUSTAINED



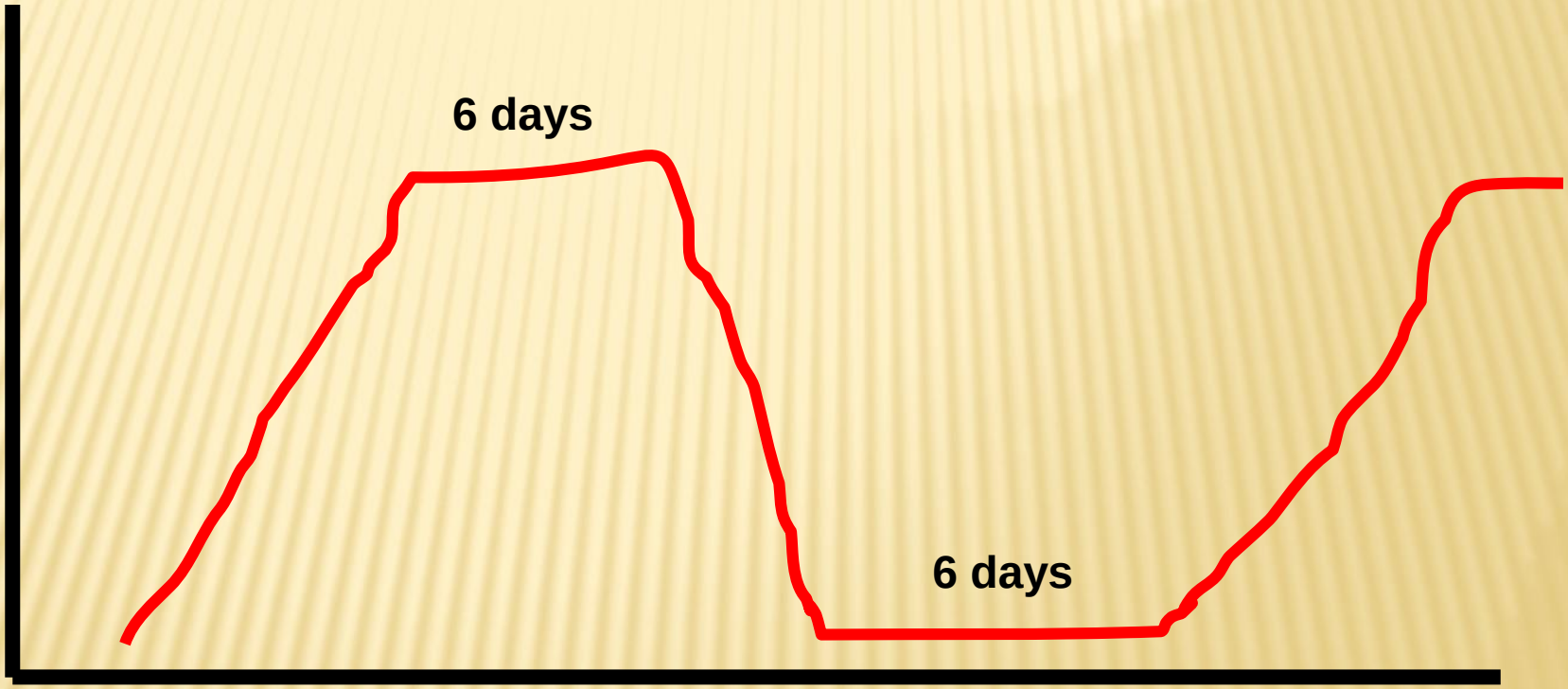
REMITTENT FEVER



INTERMITTENT FEVER

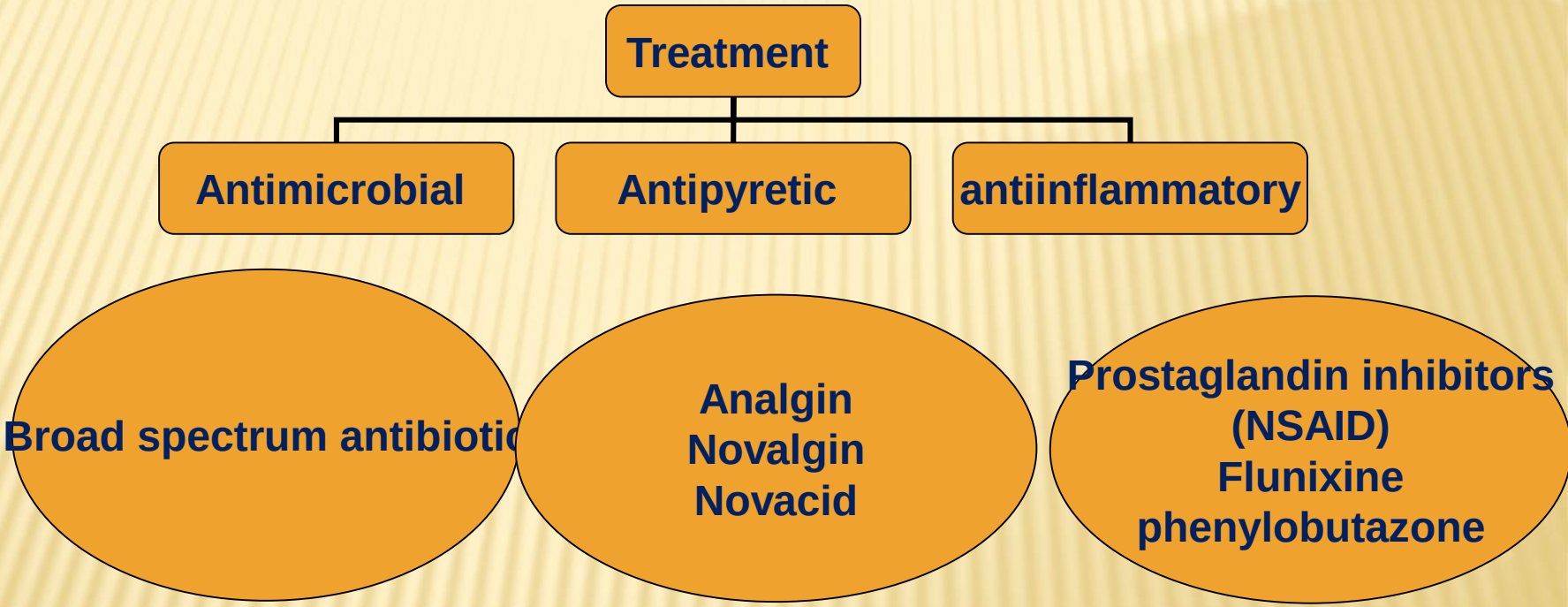


RECURRENT FEVER



ATYPICAL FEVER (VARIATIONS ARE IRREGULAR)

TREATMENT OF FEVER



Questions

EXERCISE-INDUCED BOVINE STRESS SYNDROME

- walking 3.6 km in 2 h. Blood samples and measurements of respiratory rate, ambient temperature and rectal temperature were taken immediately before exercise, and at 0.5, 1.0, 1.5 and 2.0 h during the exercise and 24 h later.
- Clinical and blood constituent data were subjected to standard analysis of variance and repeated measures analysis.
- In the field study, affected cattle were observed to show abnormally anxious and hyperactive behaviour. This behaviour was exhibited by affected cattle during the experimental exercise program where it was shown to be accompanied by hyperthermia and hyperventilation.
- The experimental study showed that affected cattle developed metabolic acidosis and became hyperglycaemic.
- Their plasma creatine kinase activity remained markedly increased at 24 h after exercise but other clinical and blood constituent variables had returned to normal values. CONCLUSION: The clinical and biochemical changes detected in affected cattle were consistent with exercise-induced malignant hyperthermia.

- Blood samples were collected from unstressed cattle and from cattle undergoing handling stress, transport stress and slaughter. The blood was analysed for ACTH, cortisol, thyroxine stimulating hormone, tri-iodothyronine (T3) and catecholamine concentrations, and for haematocrit, total plasma protein, plasma lipid, lactate and glucose concentrations. Compared to control values handling significantly increased T3, cortisol, lipid and lactate concentrations. Compared to handling, transport stress was associated with increased catecholamines and lactate concentrations, a decreased cortisol concentration and similar concentrations of T3, lipid and glucose. Compared to transport, slaughter resulted in high catecholamines, lactate and glucose, and low T3, cortisol and lipid levels. It is concluded that the response to stress has two phases, a hypothalamic-adrenal cortex phase which is associated with perceived environmental stress such as noise, and a sympathetic-adrenal-medulla phase which is associated with neurogenic stress such as transport or specifically the massive sympathetic discharge caused by stunning. Combinations of stresses produce a mixed response.