

ANIMAL COORDINATION, CONTROL & HOMEOSTASIS

1. **Hormones:** secreted from endocrine gland & transported through bloodstream

pituitary gland: Master gland – acts on other glands directing them to secrete hormone

TSH – thyroid stimulating hormone: thyroid gland

ADH – antidiuretic hormone: kidney

FSH – follicle stimulating hormone: ovaries

Growth hormone: all tissues

Thyroid gland

Regulates metabolic

thyroxine: heart

Pancreas

Insulin: liver

glucagon: muscle

Adrenal glands

Prepares body for flight/fight response

adrenaline: respiratory/circulatory

Ovaries

oestrogen: ovaries / uterus / pituitary gland

progesterone: uterus

Testes

Controls puberty & sperm production

testosterone: reproductive system

2. **Adrenaline** – produced by adrenal glands to prepare body for fight/flight

Heart: adrenaline binds to specific receptor cells in heart, causes it to contract: more frequently: increases heart rate
with more force: increases blood pressure

Liver: adrenaline binds to receptors in liver – causes conversion of glycogen → glucose: increases blood sugar levels – source of energy for rapid contractions

Blood vessels: To muscles/brain: widen – increased blood flow – cells receive more oxygen/glucose – increased respiration – work faster
To other organs: narrow – increases blood pressure

Lungs: Airways widen – more oxygen intake – increases respiration rate

3. **Thyroxine** – controls metabolic rate – negative feedback

Low thyroxine level: **Hypothalamus TRH** → **pituitary TSH** → **Thyroid gland thyroxine**

Negative feedback: receptors in brain detect increases in level: inhibits release of TSH which inhibits the release of thyroxine

People who produce too much thyroxine: oxygen/food products react quickly – release energy faster: higher heart/metabolic rate – radiate heat

4. **Menstrual Cycle**

Stage 1: Day 1-4

Uterus lining breaks down

Stage 2: Day 4-14

Uterus lining repairs – until thick spongy layer full of blood vessels is ready for fertilised egg to implant there

Stage 3: Day 14

Ovulation: egg develops & released from ovary

Stage 4: Day 14-28

Lining maintained

No fertilised egg landed on uterus wall: spongy lining starts to break down – cycle restarts

5. **Menstrual cycle hormones**

FSH – follicle-stimulating hormone

Released by: pituitary

Causes: eggs to mature in ovary

Ovary to release oestrogen

Oestrogen

Released by: ovaries

Causes: lining of uterus to grow/thicken

Pituitary to release LH

Inhibits FSH

LH – luteinising hormone

Released by: pituitary

Stimulates: ovulation – mature egg release

egg follicle remains develop into corpus luteum – secretes progesterone

Progesterone

Released by: corpus luteum – after ovulation

Causes: maintenance of uterus lining

Inhibits **FSH & LH** release

Low level: menstruation

Pregnant: level stays high to maintain uterus lining