

Definitions and Concepts for Edexcel Biology GCSE

Topic 7: Animal Control, Coordination and Homeostasis

Definitions in **bold** are for higher tier only

Definitions marked by '*' are for separate sciences only

Adrenal glands - Endocrine glands located above the kidneys that produce adrenaline.

Adrenaline - A hormone produced by the adrenal glands that is involved in the 'fight or flight' response. It increases heart rate, blood pressure, blood flow to muscles and blood glucose levels.

***Anti-diuretic hormone (ADH)** - A hormone secreted by the pituitary gland that increases the collecting duct's permeability to water, allowing more water to be reabsorbed into the blood.

Assisted Reproductive Technology (ART) - A fertility treatment in which a woman's eggs are handled outside of the body.

Barrier method - A type of contraception that prevents the sperm and egg meeting, e.g. condoms, diaphragms.

Body mass index (BMI) - A value based on height and mass used to categorise an individual as underweight, normal weight, overweight or obese. It is calculated using:

$$\text{BMI} = \frac{\text{mass (kg)}}{(\text{height (m)})^2}$$

***Bowman's capsule** - The cup-like structure at the start of a nephron that surrounds the glomerulus. Small molecules, water and ions are forced into the Bowman's capsule during filtration.

Clomifene - A drug prescribed to women who do not ovulate regularly. It stimulates the secretion of more FSH and LH, triggering egg production and ovulation.

***Collecting duct** - The final section of the nephron in which water is selectively reabsorbed and urine is sent to the ureter. **Its permeability to water is altered by ADH.**

Combined pill - A contraceptive taken orally that contains both oestrogen and progesterone.

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Contraception - A method or device used to prevent pregnancy.

Contraceptive injection - An injection that releases progesterone into the bloodstream to prevent pregnancy.

Contraceptive patch - A patch that releases both oestrogen and progesterone into the bloodstream through the skin to prevent pregnancy.

Corpus luteum - A temporary endocrine structure, formed from the remains of the follicle, that secretes progesterone.

***Dermis** - The layer of tissue below the epidermis. It contains temperature-sensitive receptors (that provide information about the external temperature) and sweat glands.

Diabetes - A condition where the homeostatic control of blood glucose levels stops working.

***Dialysis** - A medical procedure that artificially filters the blood of patients with kidney failure. It relies on a partially permeable membrane between the patient's blood and dialysis fluid.

Effector - An organ, tissue, or cell that produces a response to a stimulus.

Endocrine gland - Glands of the endocrine system that secrete hormones directly into the bloodstream.

Endocrine system - A network of glands that produce and secrete hormones into the bloodstream.

***Epidermis** - The outer layer of the skin. It contains temperature-sensitive receptors that provide information about the external temperature.

Fight or flight response - A physiological reaction that occurs in response to stress where the body prepares to confront danger or flee from it.

***Filtration** - The removal of small molecules, water and ions from the blood in the glomerulus of the kidney at high pressure.

Follicle-stimulating hormone (FSH) - A hormone secreted by the pituitary gland that binds to follicle cells, stimulating them to mature and secrete oestrogen.

***Glomerulus** - A bundle of capillaries located in the capsule of a nephron adapted for the filtration of blood.

Glucagon - A hormone secreted by the pancreas when blood glucose concentration is too low. It causes the breakdown of glycogen to glucose in the liver.

Glycogen - A store of glucose in the liver and muscle tissues.

Homeostasis - The maintenance of a stable internal environment in the body despite fluctuations in internal and external conditions.



Hormone - A cell signalling molecule produced by endocrine glands and released into the blood. It travels to a target organ and binds to receptors on effectors, initiating a response.

***Hypothalamus** - A structure in the brain that contains the thermoregulatory centre. It coordinates information from the receptors and sends instructions to the effectors.

Insulin - A hormone secreted by the pancreas when blood glucose concentration is too high. It causes liver and muscle cells to increase their uptake of glucose and the conversion of glucose to glycogen in the liver.

In vitro fertilisation (IVF) - The fertilisation of an egg using sperm outside of the body. The zygote is allowed to grow and the resulting embryo is transferred to the uterus.

***Kidney** - One of a pair of organs in the abdomen that has a role in osmoregulation and nitrogenous excretion.

Luteinising hormone (LH) - A hormone secreted by the pituitary gland that initiates ovulation and stimulates the development of the remains of the follicle into a corpus luteum.

Menstrual cycle - The monthly cycle in women that involves the development of the uterus lining, ovulation, maintenance of the uterus lining and its shedding.

Menstruation - The shedding of the uterus lining that begins at day 1 of the menstrual cycle.

Metabolic rate - The rate at which biochemical reactions occur in cells.

Mini-pill - An oral contraceptive that contains progesterone only.

Negative feedback - A corrective mechanism that allows only small shifts from a set point, reversing a change in conditions.

***Nephron** - The functional unit of the kidney.

Oestrogen - A female sex hormone released by the ovaries that causes the growth and repair of the uterus lining. **High levels of oestrogen stimulate a surge in LH production.**

***Osmoregulation** - The maintenance of constant water levels in the body fluids of an organism.

Ovaries - A pair of endocrine glands in females that secrete oestrogen into the bloodstream.

Ovulation - When an ovary releases an egg at around day 14 of the menstrual cycle.

Pancreas - An endocrine gland situated behind the stomach that produces insulin.

Pituitary gland - An endocrine gland that produces hormones which control other glands (e.g. adrenal glands). Often described as the 'master gland'.

Progesterone - A female sex hormone secreted by the corpus luteum that maintains the uterus lining. **It also inhibits FSH and LH release.**



Receptor - A specialised structure that detects a specific type of stimulus.

***Renal arteries** - Blood vessels that carry oxygenated blood to the kidneys.

***Renal veins** - Blood vessels that drain the kidneys.

***Selective reabsorption** - The selective reuptake of useful substances (all sugars, some water and some ions) into the blood. This takes place along the nephron.

***Shivering** - The involuntary contraction of muscles which generates heat from respiration.

Testes - A pair of endocrine glands in males which secrete testosterone into the bloodstream.

***Thermoregulation** - The maintenance of core body temperature.

***Thermoregulatory centre** - An area of the hypothalamus that regulates body temperature. It contains receptors sensitive to blood temperature.

Thyroid gland - An endocrine gland located in the neck that produces thyroxine.

Thyrotropin-releasing hormone (TRH) - A hormone secreted by the hypothalamus when blood thyroxine levels are lower than normal. It stimulates the pituitary gland to release TSH.

Thyrotropin-stimulating hormone (TSH) - A hormone secreted by the pituitary gland that stimulates the thyroid gland to release thyroxine.

Thyroxine - A hormone secreted by the thyroid gland that controls metabolic rate, heart rate and temperature.

***Transplant** - A medical procedure in which an organ or tissue in an individual is replaced.

Type 1 diabetes - A type of diabetes in which the pancreas fails to produce enough insulin. It is controlled using daily insulin injections, limiting refined sugar intake and getting regular exercise.

Type 2 diabetes - A type of diabetes in which a person develops insulin resistance or doesn't produce enough insulin. It is often due to obesity and is controlled by eating a balanced diet and getting regular exercise.

***Urea** - A chemical produced from the breakdown of excess amino acids in the liver.

***Ureter** - A tube that takes urine to the bladder from the kidneys.

***Urethra** - A tube that releases urine from the bladder, out of the body.

***Urinary system** - The body's drainage system that removes waste materials. It consists of the kidneys, the ureters, the bladder and the urethra.

***Urine** - The waste product of the kidney that contains urea, excess water and excess ions.



***Vasoconstriction** - Constriction of blood vessels near the surface of the skin. Less blood flows close to the skin surface, decreasing heat loss to the surroundings.

***Vasodilation** - Dilation of blood vessels near the surface of the skin. This allows blood to flow closer to the skin surface, increasing heat loss to the surroundings.

Waist-to-hip ratio - The ratio of the circumference of the waist to the circumference of the hips. It can be used to indicate abdominal obesity and is calculated using:

$$\text{waist-to-hip ratio} = \frac{\text{waist circumference (cm)}}{\text{hip circumference (cm)}}$$

