Retinoic Acid Ex-ovo Case Study Vocabulary:

Birth defects – structural or functional abnormalities present at birth resulting in physical or mental disability. Causes include missing genetic information, exposure to harmful substances, changes in mechanical loading, etc.

Central Nervous System (CNS) – part of the nervous system responsible for processing stimulation data for all parts of body; consists of the brain and spinal column

Congenital Heart Defect (CHD)– a detrimental heart abnormality caused during development

Constituent – a component of which the overall tissue consists, eg. cells, collagen, glycoaminoglycans (sugar complexes)

Contradiction – a logical incompatibility between two ideas, statements, or propositions

Deficiency – lack of a particular quantity; often used in the context of nutrition

Deformation – the relative displacement of material body due to an applied mechanical force, i.e. bending of metal beam, compression of a rubber ball, etc. Tissues also deform in response to external and internal mechanical forces.

Difference between qualitative and quantitative observations

  Qualitative – an observation which expresses non-numerically measured features, such as a color or general shape. Used to gain intuition of system and describe trends.
  Quantitative – an observation which uses numerical measurements of features.Expresses the characteristics of features within a given unit system.

Environmental Factor – a condition or agent which causes defective growth of embryo. Environmental factors are specifically not the result of a defective genome, but may be involving mis-regulation of gene expression

Gestation – the carrying of developing embryos in wombs; characteristics of mammal reproduction

Histology – the study of biological tissues at the microscale. Reagents are administered to thin tissue cross-sections to stain the constituents with different colors, thereby enabling their identification

Lethal toxicity – a degree of harm caused by a substance which causes death
**Mechanical Properties** – attributes of object which define its resistance to deformation by physical forces, often referred to as the stiffness of the object

**Metabolism** – the process of breaking down chemical energy for consumption, i.e. digestion of food

**Metabolite** – any substance produced during the process of metabolism

**Mitigation** – to moderate in force or intensity; to alleviate

**Morbidity** – the proportion of sickness (or specific disease) in a particular geographical location

**Morphogenesis** – formation and differential growth of an organism during development

**Regulation of gene expression** – Our genetic code contains the information for making all proteins necessary for biological function. To maintain the correct type and amount of protein available for this function, the source genes need to be appropriately turned on and off. The process of activating and deactivating these genes is known a regulation of gene expression.

**Sham Control** – an experimental control is a faked operative intervention that omits the step thought to be therapeutically necessary, (i.e. administration of retinoic acid patch without any retinoic acid on it)

**Structural Remodeling** – process by which cells in a tissue recycle their surrounding matrix. This involves proliferation, addition and removal of ECM proteins, such as collagen, and maturation of the matrix, e.g. collagen cross-linking. Structural remodeling directly affects mechanical properties of tissue

**Retinoic Acid** – metabolite of vitamin A which plays in integral role is vitamin A’s regulation of gene expression by binding with DNA bound nuclear receptors(RxR,RaR)

**Teratogen** - Any agent that can disturb the development of an embryo or fetus. Teratogens may cause a birth defect in the child. Or a teratogen may halt the pregnancy outright. The classes of teratogens include radiation, maternal infections, chemicals, and drugs.

**Tissue** – an aggregate of cells in an organism that have similar structure and function