



## The role of hormones in regulating vital processes in animals/ A Review Article

Zahraa Radhi Shadhan<sup>1</sup>, Shaima D.Salman<sup>2</sup>, Estabraq M Ati<sup>3</sup> & Dr.Reyam Naji Ajmi<sup>4</sup>

<sup>1,2,3,4</sup>Department of Biology Science, Mustansiriyah University, POX 46079, Iraq-Baghdad.  
Email: [zahraa.r.sh@uomustansiriyah.edu.iq](mailto:zahraa.r.sh@uomustansiriyah.edu.iq), [shaim\\_salman@uomustansiriyah.edu.iq](mailto:shaim_salman@uomustansiriyah.edu.iq),  
[reyam80a@yahoo.com](mailto:reyam80a@yahoo.com)

**Abstract:** Hormones play a vital role in animal life processes. It is produced by the endocrine glands and it circulates through the blood. This has a profound effect on the animals as a Whole. There are animals that depend on alone just to survive. Animal growth, metabolic actions, fertility, and behaviors are controlled by Hormone. Therefore, the article will help us explain how hormones cause changes in the behaviour, growth, and metabolism of animals. Selective hormones have a focus in our study: Mammary gland hormone, thyroid hormone, and sex hormone. This will aim to understand how on those hormones influence animal organism activities, such as body function and growth. This research paper hypothesizes that hormone levels will remain constant in healthy animals. Hormones can be managed, but there have side effects if animals are not kept at the correct hormone level. It is important to continuously investigate how hormones regulate and maintain important functions in animals and effects of hormone imbalances on animal health.

**Keywords:** Regulation of physiological processes, Hormone balance, Development and maturation

### 1-INTRODUCTION

Hormones are used by animal bodies to control a variety of biological processes. Endocrine glands secrete substances into the bloodstream that target particular cells and organs [1] They assist in controlling different bodily functions, such as metabolism, growth, reproduction, adaptation to the environment, and dealing with stress. As stated by [2], the main types of hormones are categorized into two groups: protein hormones and peptide hormones. Glucagon and insulin are examples of such hormones, with their primary role being the regulation of blood sugar levels. Steroid hormones such as testosterone, estrogen, and cortisol are essential for controlling growth, reproduction, and reactions to stress. Amino hormones like thyroxine and adrenaline impact temperature, heart rate, and metabolism. Hormones are essential in the following key processes: 1. Regulation of metabolism: Hormones are essential for controlling metabolic processes, such as converting food into energy for cell production and maintenance. One illustration of this concept is the coordination between glucagon and insulin in controlling blood glucose levels. When blood sugar is low, glucagon tells the liver to release glucose, while insulin helps cells absorb the glucose for energy or storage. The child was not allowed to eat any cookies before dinner. GH, which is made by the pituitary gland, is essential in stimulating protein and tissue formation, making it a key hormone in growth and development processes. The thyroid gland secretes the hormone



T4.

## **1-2 Disruption of hormones within the body**

Based on citation [3], a person might display symptoms due to an imbalance in hormones. Hormonal imbalance can be caused by unexpected weight changes, excessive sweating, sleep issues, dry skin or rash, changes in blood pressure and heart rate, osteoporosis, fluctuations in blood sugar levels, increased thirst, fatigue, infertility, and blurred vision.

## **1-3 Health issues associated with hormones as stated in [5].**

Significantly high or low hormone levels can cause a range of problems in the body, such as:

Diabetes Type 1 and Type 2 result from unstable blood sugar levels, causing elevated blood sugar in people with diabetes. There are two forms of diabetes: Type 1, commonly referred to as juvenile diabetes, and Type 2.

2- Hyperthyroidism may arise because of different causes, including autoimmune conditions that lead the immune system to erroneously attack the thyroid gland. This causes an excess production of thyroid hormones, resulting in various complications within the body.

3- Cushing syndrome: Excessive cortisol levels in the body, often caused by factors such as adrenal gland tumors, lead to this condition. Various factors, including thyroid surgery or radiation exposure, cause 4-hypothyroidism by decreasing thyroid hormone production and causing health complications. Addison's disease is defined as the inadequate production of cortisol and aldosterone by the adrenal gland, which may result from damage to the gland.

## **1-4 Ways to adjust to the surroundings**

Hormones play a crucial role in aiding animals to adapt to sudden and continuous environmental changes. This includes adapting to temperature fluctuations, availability of food and water, seasonal changes, and facing unforeseen dangers. Fluctuations in temperature: The release of adrenaline and noradrenaline by the adrenal glands in response to emergencies and stress can elevate heart rate and enhance blood flow to the muscles, enabling a heightened ability to either flee or engage in combat [7]. Two thyroid hormones, T<sub>3</sub> and T<sub>4</sub>, help regulate the body's metabolism, contributing to heat production and maintaining internal body temperature in cold weather. During times of body overheating, these hormones can help reduce the metabolic rate to decrease the generation of internal heat [8]. Adjusting to the presence of food and water: Insulin and glucagon cooperate to control blood sugar levels to ensure the body has enough energy for vital functions. Glucagon releases glucose from the liver when food is scarce, whereas insulin stores excess energy. Aldosterone, secreted by the adrenal gland, helps regulate the body's water and salt



balance by prompting the kidneys to retain sodium and water, keeping blood volume and pressure stable during dehydration[9].

### **Seasonal fluctuations based on [10]:**

The pineal gland produces melatonin, which is affected by light, increasing its production during darkness. It plays a role in regulating seasonal and daily biological rhythms, helping animals adapt to variations in daylight length and seasons. Cortisol assists the body in adjusting to environmental changes by increasing blood sugar levels and speeding up the breakdown of proteins and fats to supply the necessary energy.

Based on [11], sudden risks exposure can be exposure Adrenaline and nor adrenaline increase the immediate response to emergencies by increasing heart rate and muscle strength and improving blood flow to vital areas, enabling animals to escape or defend themselves.

### **1-5 Problem Review include according [12]:**

1. Hormonal processes play a vital role in regulating numerous biological functions in animals, including growth, metabolism, reproduction, and stress responses. However, there are still certain elements regarding the influence of hormones on these functions that are not entirely clear. The specific mechanisms by which hormones manage these processes, as well as their interactions with environmental and genetic factors, remain incompletely understood.

Hormonal imbalances can cause many health problems in animals, including infertility, uncontrolled diseases, and deficiencies of some nutrients. Despite more knowledge about how individual hormones behave, scientists still do not know the exact effects changes in hormone levels generally lead to important processes of the body or how these changes may affect overall health. Perhaps, current research of environmental science also has major shortcomings in understanding how shifts to the environment (for example pollution and anthropogenic generated climate change), thereby affecting animal hormone systems. More research is needed to assess the impacts on hormone control and therefore animal health and biological functions from environmental stressors [13]. Furthermore, it is essential to develop the research models so that there is more clarity on how hormones influence physiological functions in other animals. Further sophisticated and reliable measurements are necessary to lead to more precise experimental evidence, because existing models may not reflect the full complexity of hormonal interactions [14].

### **1-6 Solutions:**

The suggested ways to enhance the hormonal balance of animals such as: providing food supplements containing hormones or using hormonal drugs, and practicing environment management measures comprising building models for reducing environmental pollution at all levels that affect hormonal systems with particular emphasis on air and water quality. teaching the medical and scientific community about how hormone balance works and the treatment of hormonal imbalances. Developing better models for



hormone studies which utilize new technologies to produce more accurate results regulating to reduce harm from animal health or the environment, or using research results to inform policy on animals or the environment.

### 3- Conclusion:

Animals need hormones to regulate their essential processes. Key systems for maintenance are at the interface of interactions among hormones. For instance, it is important to have a delicate interplay between pituitary hormones and sex hormones for reproduction to be successful, and insulin must be counterbalanced by glucagon in order to control blood sugar. Hormones in the animal kingdom are essential for maintaining important processes. Understanding the roles of these molecules and how they interact helps us to learn more about how biology works. This information also provides a foundation for developing new medical treatments for diseases that result from hormone imbalances. More is needed to understand the role of hormones in behavior and health.

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