Answer Key: Formative Assessment 2: The Thyroid

1: What is the stimulus for Thyroxine production and where is it detected?

(2 marks)

*Stimulus: low levels of thyroid hormone in the blood (0.5), low metabolic rate (0.5)*

*Detected by hypothalamus (1)*

2: After the stimulus is detected, describe the sequence of events in the body that leads to secretion of Thyroxine.

(12 marks)

*After the stimulus is detected, the hypothalamus (1) produces Thyrotropin Releasing Factor (1) which travels through the blood vessels (1) of the infundibulum (1) to the Anterior Pituitary (1)*

*TRF stimulates (1) the AP to produce Thyroid Stimulating Hormone (1) which is released into the systemic circulation (1)*

*The thyroid has specific receptors for TSH, so it can bind (1). TSH stimulates (1) the Thyroid (1) to produce Thyroxine (1)*

3: One symptom of Hypothyroidism is cold intolerance. Explain why this is the case.

(6 marks)

*Thyroxine regulates metabolic rate (1). One aspect of metabolism is heat production (1). If not enough thyroxine is produced (1), metabolic rate will drop (1), so less heat will be produced (1). Therefore the person with Hypothyroidism will feel cold. (1)*

4: A patient is tested for thyroid disease, and is discovered to have TSH levels far lower than normal.

1. Does this patient have hyperthyroidism or hypothyroidism?

(1 mark)

*Hyperthyroidism*

1. Explain why the TSH levels are so low.

(6 marks)

*In hyperthyroidism, too much thyroxine is produced (1). This is detected by the hypothalamus (1) and Anterior Pituitary (1), which cease production of TRF and TSH (1) in an effort to reduce Thyroxine production (1) via negative feedback (1)*