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**MATRIC NUMBER: 15/MHS04/005**

**COURSE CODE: NTD 206**

**COURSE TITLE: HUMAN NUTRITION AND BIOCHEMISTRY 11**

 **ASSIGNMENT**

1. Discuss calcium as a macro-mineral under the following headings
2. Food sources
3. Functions
4. Dietary sources
5. Factors affecting absorption and factors stimulating absorption
6. Hypocalcaemia and hypercalcaemia.

**ANSWERS**

1. A. **FOOD SOURCES OF CALCIUM**

They include

1. Cheese
2. Yoghurt
3. Nuts e.g. Almonds
4. Milk
5. Some leafy vegetables e.g. broccoli, cabbage, okra
6. Soybeans
7. Fish where bones are eaten e.g. sardines and pilchards

B. **FUNCTIONS OF CALCIUM**

They include:

1. They help in building strong bones and teeth
2. They regulate muscle contraction, including heartbeat
3. They help in making blood clot normally
4. They help in sending and receiving nerve signals
5. They help in releasing hormones and other chemicals.
6. It helps to prevent colon and rectum cancer
7. It helps to prevent gum diseases
8. It helps in reducing pregnancy risks such as high blood pressure and preeclampsia
9. Helps in preventing osteoporosis and broken bones

C. **DIETARY SOURCES**

1. Cheese
2. Yoghurt
3. Nuts e.g. Almonds
4. Milk
5. Some leafy vegetables e.g. broccoli, cabbage, okra
6. Soybeans
7. Fish where bones are eaten e.g. sardines and pilchards

D. **FACTORS ATTECTING ABSORPTION**

1. Vitamin D deficiency
2. Gastrointestinal problems
3. Hypochlorhydria (low stomach acid)
4. Stress
5. Lack of exercise
6. High fat intake
7. High protein intake
8. Oxalic acid foods (beet greens, chard, spinach, cocoa)
9. Phytic acid foods (whole grains)
10. High phosphorus intake

E. **FACTORS STIMULATING ABSORPTION OF CALCIUM**

1. Body needs such as growth, pregnancy, lactation
2. Vitamin D
3. Milk lactose
4. Acidic environment (hydrochloric acid, citric acid, ascorbic acid)
5. Protein intake and amino acids such as lysine and glycine
6. Fat intake
7. Exercise
8. Phosphorus balance.

F. **HYPERCALCEMIA**

It is a condition in which the calcium lever in the body is above the normal amount needed for bone formation and muscle contraction, releasing hormone. The main cause is over activity of the parathyroid gland. Cancer and some medication may cause over activity of the calcium level.

Etiology

Increased GI Absorption

* Vitamin D excess
* Elevated PTH

Decreased Urinary Excretion:

* Thiazide diuretics

Increased Loss from Bone:

* Elevated PTH
* Hyperparathyroidism
* Malignancy
* Osteolytic metastases

Complication

* Metastatic calcification
* Renal stones

**HYPOCALCAEMIA**

Is a condition in which the calcium level below the normal level is caused by low level of PTH, low level of magnesium, deficiency of vitamin D. the kidney dysfunction play role in hypocalcaemia.

Etiology

* Decreased GI abdorption
* Poor dietary intake of calcium, impair absorption
* Increased urinary excretion
* Decreased urinary excretion
* Decreased bone resorption/increased mineralization
* Low PTH
* PTH resistance
* Vitamin D deficiency

Complication

* Tetany: condition of mineral imbalance in the body that results in severe muscle spasms. Usually occurs when the concentration of calcium ions (Ca++) in extracellular fluids below normal.