Human nutrition lecture 8

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In animals, the energy content of food is expressed in terms of heat energy

The calorie is a unit of energy widely used in nutrition

The amount of heat liberated by complete combustion of 1g food in a bomb calorimeter is termed as gross calorific (gross energy) value .

The actual energy produced by 1g food is its physiological value

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Actual energy produced by 1 gm of food.

S r . No.	Food component	Gross calorific value (Kcal/gm)	Physiological value (Kcal /gm)
1	carbohydrate	4.1	4.0
2	protein	5.65	4.0
3	lipids	9.45	9.0

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Nutritional disorders and disorders of digestive system



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A **balanced diet** should provide around
50-60% of total **calories** from **carbohydrates**, preferably from complex **carbohydrates**,
about 10-15% from **proteins** and
20-30% from both visible and invisible fat.

An ideal **daily** intake of **calories** varies depending on age, metabolism and levels of physical activity, among other things.
Generally, the **recommended daily calorie** intake is
2,000 **calories a day** for women and
2,500 for men.

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Nutrition related disorders can be categorized based on the food that an individual consumes and conditions that develop due to malfunctioning of the organ/s or glands associated with digestive system.

extra or less of nutrition can lead to dietary disorder. .

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Inadequate intake of proteins causes

Protein Energy Malnutrition (PEM).

It can be associated with inadequacy of vitamins and minerals in diet.

PEM can cause diseases like

1. Kwashiorkor and
2. Marasmus.

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Kwashiorkor :

Only protein deficiency + calories normal
disorder is found generally
in children between one to three years of age.

Children suffering from Kwashiorkor are

1. underweight and show stunted growth,
2. poor brain development,
3. Loss of appetite,
4. Anemia (less hemoglobin),
5. protruding belly,
6. Slender legs,
7. bulging eye,
8. edema of lower legs and face,
9. change in skin and hair color.

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Marasmus

protein deficiency + calories deficiency

: It is a prolonged protein energy

found in infants under one year of age.

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Marasmus symptoms

1. impairs physical growth and
2. retards mental development,
3. Subcutaneous fat disappears,
4. ribs become prominent,
5. limbs become thin,
6. skin becomes dry, thin and wrinkled,
7. loss of weight,
8. digestion and absorption of food stops due to atrophy of digestive glands.
9. There is no oedema.

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Marasmus cause

1. unavailability of nutritious food.
2. Poverty,
3. large family size,
4. ill spacing of children,
5. Early termination of breast feeding and
6. Over diluted milk

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Marasmus complication

Because of malnutrition, infectious diseases become opportunistic and it worsens the condition.

Marasmus treatment

Proper diet can help in reversal of symptoms.

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Indigestion

Indigestion cause

1. Overeating,
2. inadequate enzyme
3. secretion,
4. spicy food,
5. anxiety
6. Improperly digested food or food poisoning also can cause indigestion.

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Indigestion symptoms

1. discomfort
2. loss of appetite,
3. acidity (acid reflux),
4. heart burn,
5. regurgitation,
6. dyspepsia (upper abdominal pain),
7. stomach pain.

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Indigestion treatment

1. Avoiding eating large meal,
2. lying down after food
3. spicy, oily, junk food,
4. smoking,
5. alcohol

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constipation

When frequency of defecation is reduced to less than once per week the condition is called constipation.

Difficulty in defecation may result in

1. abdominal pain
2. distortion,
3. rarely perforation.

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constipation causes

1. affected colonic mobility due to neurological dysfunction like spinal cord injury,
2. low fiber diet,
3. inadequate fluid intake and
4. inactivity.

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Constipation treatment

1. Roughage,
2. sufficient fluids in diet,
3. exercise can

help improve the conditions.

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Diarrhoea

Passing loose watery stools more than three times a day is called diarrhoea

The causes of diarrhoea are

1. Infection through food and water or
2. disorders like ulcer,
3. colitis,
4. inflammation of intestine or
5. irritable bowel syndrome.

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Diarrhoea symptoms

1. passing loose watery stools
2. Diarrhea can lead to dehydration.
3. Other symptoms are blood in stool,
4. nausea,
5. bloating,
6. fever

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vomiting

In this condition, the stomach contents are thrown out of the mouth due to reverse peristaltic movements of gastric wall.

. It is typically associated with nauseatic feeling.

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It is controlled by non-vital vomiting centre of medulla. .

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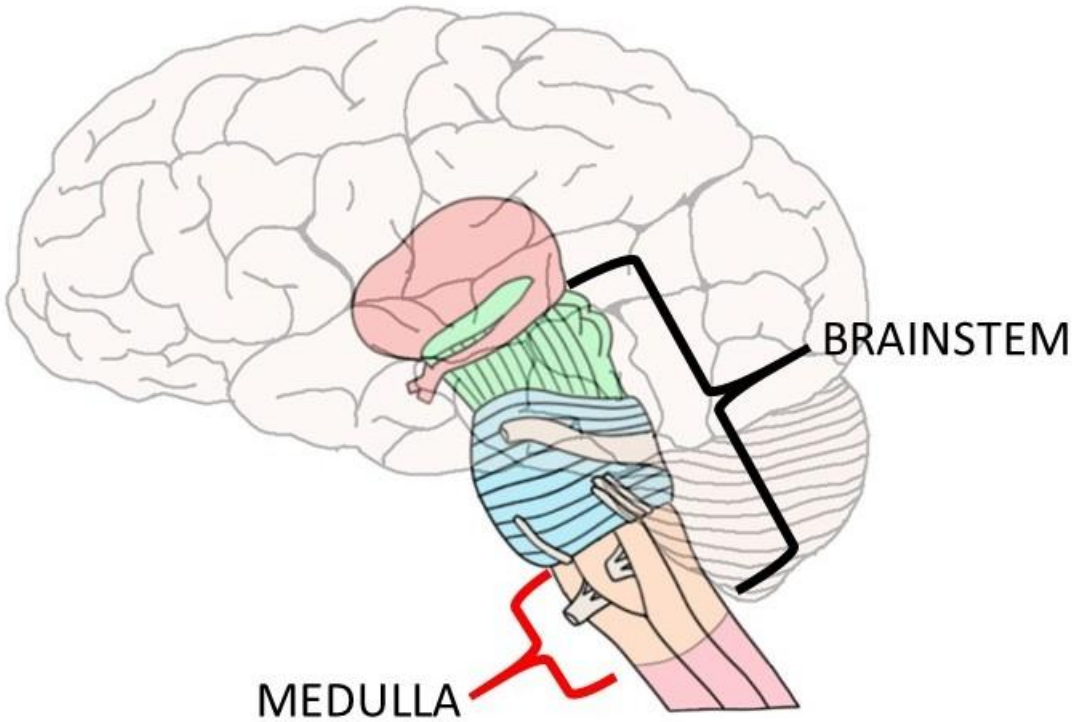

jaundice

the symptoms of condition called jaundice

1. yellowness of conjunctiva of eyes and skin and
2. whitish stool

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Jaundice cause

It is a sign of abnormal bilirubin metabolism and excretion.

1. excessive break down of red blood cells takes place along with increased bilirubin level than the liver can handle or
2. obstruction in the flow of bile from liver to duodenum.

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Bilirubin produced from breakdown of haemoglobin is

1. water soluble or
2. fat soluble.

Fat soluble bilirubin is toxic to brain cells.

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1. There is no specific treatment to jaundice.
2. Supportive care,
3. Proper rest are the treatments given to the patient.

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Regulation of gastric function

Secretion of digestive enzymes and juices is under neurohormonal control

Neuro = related to neuron /brain
Hormonal = related to chemicals of endocrine gland

Sight ,smell ,taste , thought of food =stimulate brain center

These center activate x'th cranial nerve = vagus nerve

Vagus nerve stimulate gastric secretion

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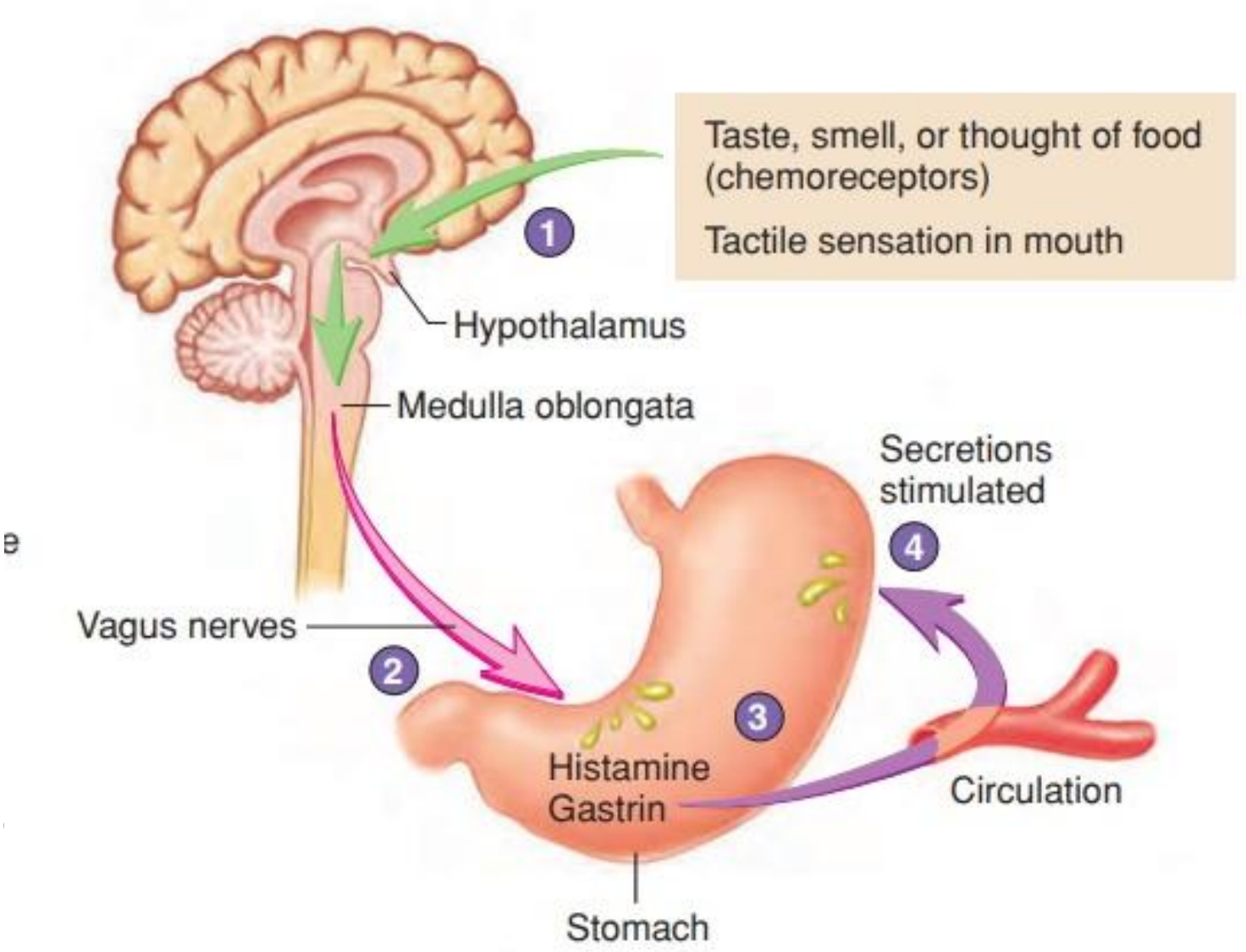
Taste, smell, or thought of food (chemoreceptors)
Tactile sensation in mouth
1
Hypothalamus
Medulla oblongata
Secretions stimulated
4
Vagus nerves
2
3
Histamine
Gastrin
Circulation
Stomach

Hormones involved in secretion of digestive enzyme and juice

1 . Gastric = to stimulate secretion of gastric juice in stomach

2. GIP = gastric inhibiting peptide =to inhibit secretion of gastric juice in stomach

3.secretin = 1.to inhibit secretion of gastric juice in stomach

2.to stimulates secretion of bile juice from liver ,pancreatic juice , intestinal juice

4.CCK = cholecyctokinin = 1. same as secreting

2.To induce satiety /feeling of fullness or satisfication

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