Hunger

Module 35

Motivation

Hunger
- The Physiology of Hunger
- The Psychology of Hunger
Hunger

When do we eat?
When we are hungry.
When are we hungry?
When there is no food in our stomach.

How do we know when our stomach is empty?
Stomach growls. Also called hunger pangs.

The Physiology of Hunger

Stomach contractions (pangs) send signals to the brain making us aware of our hunger.

OBJECTIVE 35-1 | Describe the physiological determinants of hunger.

Stomachs Removed

Tsang (1938) removed rat stomachs connected the esophagus to the small intestines and yet the rats felt hungry (and ate food).
Glucose: $C_6H_{12}O_6$

Glucose level in the blood is maintained. Insulin decreases glucose in blood making us feel hungry.

Glucose Molecule

Glucose & Brain

Levels of glucose in the blood are monitored by receptors (neurons) in the stomach, liver, intestines, they send signals to the hypothalamus in the brain.

Rat Hypothalamus

Hypothalamic Centers

Lateral hypothalamus (LH) brings on hunger (stimulation). Destroy it and the animal has no interest in eating. Reduction of blood glucose stimulates orexin in LH which leads to ravenous eating in rats.
Hypothalamic Centers

Ventromedial hypothalamus (VMH) depresses hunger (stimulation). Destroy it and the animal eats excessively.

Hypothalamic Centers

Hypothalamus & Hormones

<table>
<thead>
<tr>
<th>Hormone</th>
<th>Tissue</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orexin increase</td>
<td>Hypothalamus</td>
<td>Increases hunger</td>
</tr>
<tr>
<td>Ghrelin increase</td>
<td>Stomach</td>
<td>Increases hunger</td>
</tr>
<tr>
<td>Insulin increase</td>
<td>Pancreas</td>
<td>Increases hunger</td>
</tr>
<tr>
<td>Leptin increase</td>
<td>Fat cells</td>
<td>Decreases hunger</td>
</tr>
<tr>
<td>PPY increase</td>
<td>Digestive tract</td>
<td>Decreases hunger</td>
</tr>
</tbody>
</table>

Hypothalamus monitors a number of hormones that are related to hunger.

Set-Point Theory

Manipulating lateral and ventromedial hypothalamus alters the body’s “weight thermostat.”

Set-Point Theory

If weight is lost – food intake increases and energy expenditure decreases. If weight is gained – the opposite takes place.
The Psychology of Hunger

Memory plays an important role in hunger. Due to difficulties with retention, amnesia patients eat frequently, if given food (Rozin et al., 1998).

OBJECTIVE 35-2| Discuss psychological and cultural influences on hunger.

Taste Preference: Biology or Culture?

Body chemistry and environmental factors together influence not only when we feel hunger but what we feel hungry for!

Hot Cultures like Hot Spices

Countries with hot climates use more bacteria-inhibiting spices in meat dishes.
Eating Disorders

**Anorexia Nervosa:** Characterized by a normal-weight person (usually adolescent women) losing weight continuously and yet feeling overweight.

**Bulimia Nervosa:** A disorder characterized by episodes of overeating, usually of high-calorie foods, followed by vomiting, laxative use, fasting, or excessive exercise.

**OBJECTIVE 35-3|** Explain how the eating disorders anorexia nervosa and bulimia nervosa demonstrate the influence of psychological forces on physiologically motivated behaviors.

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**Obesity**

A disorder characterized by excessive overweight. Obesity increases risk and health issues like cardiovascular diseases, diabetes hypertension, arthritis, and back problems.

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**Lisa O'Connor/ Zuma/ Corbis**

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Reasons for Eating Disorders

1. **Sexual Abuse**: Childhood sexual abuse does not cause eating disorders.
2. **Family**: Raised in a family where weight is excessive concern results in younger generation developing eating disorders.
3. **Genetics**: Twin studies have shown eating disorders are more likely to occur in identical than fraternal twins.

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Body Image (Women)

Western culture tends to over-emphasize thin body image more than other cultures.

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Summary

- **Biological**:
  - mid-hypothalamic centers in the brain monitoring appetite
  - appetitive hormones
  - stomach volume
  - satiety/satiety point
  - universal attraction to sweet and salty
  - adaptive mechanisms involving sweet foods

- **Psychological**:
  - choice and craving of a variety of tasty foods
  - memory of time elapsed since last meal
  - mood

- **Social cultural**:
  - culturally shared taste preferences
  - learned restraint in cultures identifying thinness

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