Lecture #4 Notes

Objectives

- Define the following: (a) heat of combustion, (b) digestive efficiency, and (c) Atwater factors.
- Compute the energy content of a meal from its macronutrient composition.
- Understand the concepts of direct calorimetry, indirect calorimetry, closed-circuit spirometry, and open-circuit spirometry.
- Describe closed-circuit and open-circuit spirometry for measuring oxygen uptake determinations.
- Define RQ. Discuss its use to quantify (1) energy release in metabolism, and (2) the composition of the food mixture metabolized.

What are Calories?

How to Measure Calories - Calorimetry

Heat of Combustion

Net Energy Value of Foods

Energy Value of a Meal

Measuring Human kCal Production

Heat Produced by the Body

Direct Calorimetry

Indirect Calorimetry

Direct Versus Indirect Calorimetry

Caloric Transformation for Oxygen

The Respiratory Quotient (RQ)

RQ For CHO, Lipid and Protein

RQ For a Mixed Diet

Thermal Equivalent of Oxygen for the RQ

Liters of Oxygen and kCals