

Calorie Encyclopedia Article

Calorie

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Calorie

A calorie is a unit of potential energy contained by a substance, which can be liberated when the material is oxidized, usually by combustion in the presence of oxygen. A calorie is defined as: "the energy required to raise the temperature of one gram of pure water by one degree Centigrade under standard conditions." The standard conditions involve an atmospheric pressure of one atmosphere, and a temperature change from -4.1 to -2.3°F (15.5 - 16.5°C).

The calorie just defined is sometimes referred to as a gram-calorie or small calorie (short-form: cal). This is done to distinguish it from the calorie (or Cal) used as a measure of energy by dieticians, also known as a large calorie, or kilocalorie (kcal). A Calorie is equal to 1,000 calories.

Energy can also be measured in other units, which can be converted among each other. One calorie is equivalent to 3.968 British thermal units (btu). A calorie is also equivalent to 4.187 joules (also known as an International Table calorie). The joule is the unit of energy that is most commonly used by scientists.

Data concerning the calorific energy contained by organic materials are usually obtained by completely oxidizing a known quantity of a substance by igniting it in a device known as a pressure-bomb. The amount of energy released is determined by measuring the increase in temperature of a known quantity of water contained within the pressure-bomb. Pure carbohydrates have a calorific content of about 4,600 cal/g (4.6 Cal/g), while proteins contain about 4,800 cal/g, and fats about 6,000-9,000 cal/g.