The Difference in the Energy Release of Lipids vs. Carbohydrates Based on Their Chemical Structure

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This project was put forward in an effort to distinguish how the chemical structures of lipids and carbohydrates affect the amounts of energy released when heat ruptures the bonds holding together the atoms comprising the macromolecules. The amount of energy released by the macromolecules was determined by a calorimeter. The calorimeter contained 100 g of water, and the initial and final temperatures of the water were measured. Foods containing significant measures of lipids (walnuts, peanuts, cashews) and foods containing significant measures of carbohydrates (kidney beans, chickpeas, raisins) were measured for their initial mass using a gram scale. After being completely burnt out, their final mass was measured. Using the equation Q = mc?t, the amount of calories absorbed (equal to the amount of energy released by the food) was calculated. Converting the calories released obtained by Q = mc?t to kilocalories and dividing by the change in mass of the food indicates the amount of energy stored per gram in each of the foods. The equation Q = mc?t provided insight about the calories released by the foods. On average, the lipidous foods had a greater amount of energy released than did the foods with higher measures of carbohydrates. Higher averages of energy stored per gram and energy released in the foods with higher measures of lipids indicated that lipids store more energy in covalent bonds between the atoms of the macromolecules than carbohydrates.

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