



SNS COLLEGE OF TECHNOLOGY

**An Autonomous Institution
Coimbatore - 35**

Accredited by NBA – AICTE and Accredited by NACC – UGC with 'A+ Grade
Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai.

DEPARTMENT OF FOOD TECHNOLOGY

19FTO302-FOOD NUTRITION

III – YEAR VI SEMESTER

UNIT-III Energy Value Determination



INTRODUCTION

What is Energy value determination?





The POWER of Food!!!



Food energy is the amount of energy obtained from food that is available through cellular respiration. As food burns, it releases energy. Formula to calculate food energy:

Energy released from calories (cal) per gram (g) = $\frac{\text{mass of water (g)} \times \text{temperature change (}^\circ\text{C)}}{\text{mass of sample (g)}}$

ENPOWER

Procedures

1. Connect the apparatus as shown in the first diagram on the slide.
2. Weigh the food sample and record it. Add 50 ml of water in the boiling water.
3. Start the cooling apparatus and note that it reads the energy as zero.
4. Set up the apparatus to record. Heat the food in burner flame to light it.
5. Heat the layer of water with the burning food. Use complete burn. Weigh the food and note it.
6. Weigh the burnt food with the same scale.

RESULTS

Energy released from calories (cal) per gram (g)

$\frac{\text{mass of water (g)} \times \text{temperature change (}^\circ\text{C)}}{\text{mass of sample (g)}}$

• 4907.3 J
• 4.907 KJ

Energy released from peanuts (cal) per gram (g)

$\frac{\text{mass of water (g)} \times \text{temperature change (}^\circ\text{C)}}{\text{mass of sample (g)}}$

• 6007.2 J
• 6.007 KJ

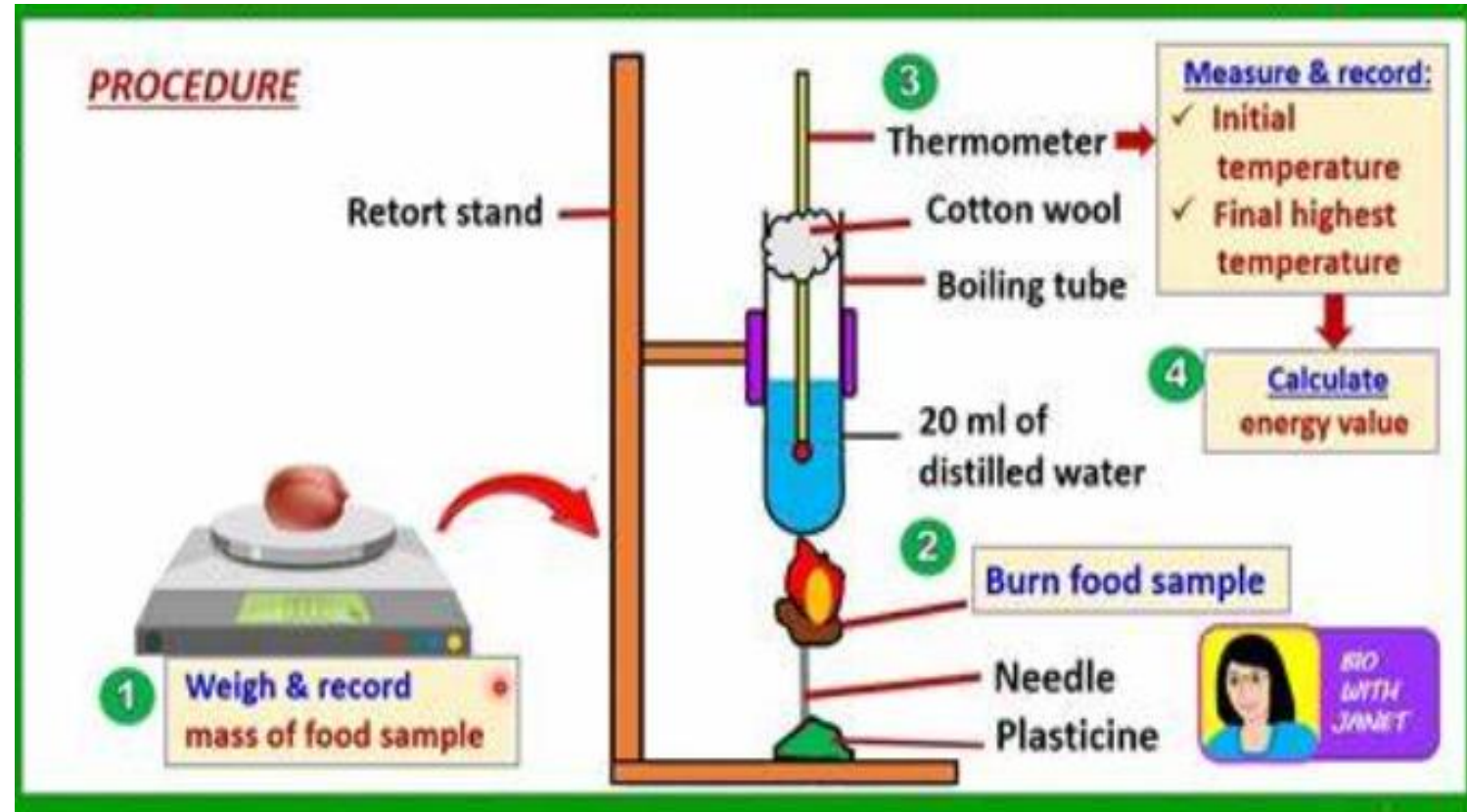


FOOD ENERGY

The energy or calorific value of food depends on amount of energy yielding factors in them. Classically the total energy content of a food was determined using a bomb calorimeter. The food was burned in a bomb calorimeter and the amount of energy released was measured. Major energy sources in foods are carbohydrates, fats and protein. In some other foods alcohols, organic acids and polys may be sources of energy.



Calorie determination



$$\text{Energy in J/g} = \frac{(\text{Final Temp} - \text{Start Temp}) \times 20(\text{g}) \times 4.2}{\text{Mass of food (g)}}$$

- ❖ 4.2 Joules of energy is required to raise temperature of 1 g of sample by 1 degree celuis
- ❖ 1 ml of water is equal to 1



Calorie values of macronutrients



S.NO	MacroNutrients	Calorie Value
1	Carbohydrate	4
2	Protein	4
3	Fat	9
4	Alcohol	7



Activity:



Consider a burger contains 50 g of carbohydrate, 42 g of fat, 27 g of protein. Calculate the Energy of the burger



Calculation



686 Calories





THANK YOU