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HUMAN BODY ENERGY USE
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INTRODUCTION
How much energy do we humans use just staying alive? And how many miles-per-gallon do we get on a long hike? The answers are given below. Because various scientific disciplines call the same thing by different names it is often difficult to have a 'gut feel' for information like this that has long been known.

CALCULATIONS
The conventional figure for human daily energy intake is about 2,000 Calories. Eat less than that and we tend to lose weight. Eat more than that and we tend to gain weight. This figure of 2,000 Calories is for a modern, sedentary human of average build and under average circumstances. Those Calories keep our bodies warm, pump our blood, and enable us to walk around the house. Lumberjacks and athletes may need 4,000 or more Calories daily, those additional Calories providing the extra muscle power needed for their accomplishments. See http://en.wikipedia.org/wiki/Food_energy

The formula "1 Calorie = 1,000 calories" is correct, but confusing. The term 'Calorie', spelled with a capital C, refers to food calories or kilocalories. The term 'calorie', spelled with a small c, refers to scientific or gram calories, defined as "1 calorie will heat one gram of water by one degree Celsius". See http://en.wikipedia.org/wiki/Calorie

From various Internet sources we learn that 1 Calorie (food calorie or kilocalorie) equals 4.184 Kilo Joules (KJ), or 1.162 watt-hours (WH) of energy. Thus, 2,000 Calories = 2,000 x 1.162 = 2,324 watt-hours of energy. For example's sake, let us bump that up 3% to 2,400 watt-hours. See http://en.wikipedia.org/wiki/Food_energy and http://www.conversion-website.com/power/watt_to_kilocalorie_per_hour.html

RESULTS
What is there around us that uses 2,400 watt-hours of energy? How about a 100-watt incandescent light bulb that burns continuously for 24 hours a day? That's right. You and I are each roughly equivalent in body energy consumption to a 100-watt incandescent light bulb burning continuously!

Now, an incandescent light bulb produces about 10% light and 90% heat from its energy input. Whether you and I produce more than 10% useful work output is not the subject of this report!

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COST COMPARISONS

What does it cost to fuel this 2,400 watt-hour (2.4 KWH) human machine? There is a wide range as discussed below.

1. Forage- Living off the land by foraging for fruits, nuts, and berries with an occasional fish or small land animal might cost nothing at all but the time to find the food. In 21st century urban America 'dumpster diving' is the modern way to forage.
2. Cooking on a budget- We might get away with $5 a day if we really like peanut butter and bologna. Otherwise figure on at least $10 a day.
3. Eating out- Food prepared by others is widely available from $10 a day to maybe $100 a day depending on our desires and budget.
4. Electricity- We cannot plug ourselves in, but if we could, then at $0.13/KWH we would need 31-cents a day to keep us going if the energy were all converted without loss.
5. Gasoline- Gasoline tastes and smells terrible! But if our energy could be derived from gasoline at $4.50 a gallon then it might cost 30 cents a day to keep us going. We would need ¼ liter or 0.07 gallon if the energy were all converted without loss.

WALKING FUEL ECONOMY

At 2 miles per hour, many of us could walk 20 miles in ten hours. From the calculator at http://walking.about.com/library/cal/uccalc1.htm we would need an additional 2,000 Calories for that effort, or 4,000 Calories total for the day. That would be 4.8 KWH for the day's 20 miles and resting the remainder of the day.

The Environmental Protection Agency (EPA) calculates that 33.7 KWH of electrical energy is equivalent to the energy in one gallon of gasoline. Thus, 4.8 KWH would be equivalent to 0.142 gallons of gasoline. 20 miles / 0.142 gallons = 140.8 mpge (miles per gallon equivalent).