Atkins or "Fadkins"?

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Part I – Macronutrients and Energy

Two friends of yours, Janine and Mitchell, join you at lunch. During your conversation, Janine comments on Mitchell's choice of food: a small bowl of cottage cheese, a chicken salad with vinegar and oil dressing, and a glass of ice water.

"What, are you on some kind of a health kick?" Janine asks, as she plows her way through a cheeseburger and a basket of fries. "First jogging every morning, now rabbit food?"

"It's this new diet I'm trying," Mitchell says. "Someone told me it's really good. And I thought I could lose some weight."

"From where?" Janine asks, looking Mitchell up and down. As you look at your friend, you have to agree with Janine: tall, lanky Mitchell doesn't look like he has an ounce of spare fat on him.

"Wait a minute," Janine says, "You're not on that Fadkins diet, are you? That diet where you eat all protein and no carbs?"

"Yeah, I am," Mitchell says, defensively. "I hear it's really good. Someone my brother knows lost ten pounds in like a month."

"Don't you know those high-protein diets are bad for you?" Janine says, taking another sip of her milkshake. "If you eat way too much protein and not enough carbs you can ruin your kidneys forever because of all the nitrogen you have to process breaking down the protein," Janine says. "Haven't you heard that in the old days, the mountain men used to get really sick and sometimes die if they had nothing to eat but venison and rabbits and lean meat like that? And there was some high-protein, low-carb, no-fat diet back in the 70's or 80's or something that people were dying from. Besides, if your brain doesn't get carbs—well, glucose, anyway—you get really cranky. You have to have enough carbs."

"Well, yeah," Mitchell says, "that's if you only eat lean protein and nothing else. But this diet lets you have fat, and you burn that for energy so you don't get problems like the mountain men had. See," Mitchell goes on, before Janine can interrupt him, "the thing is, carbs are like easy energy or something, so your body burns carbs when it can get them and leaves your body fat alone. If you cut down on carbs, you train your body to burn fat instead. Once you get your body trained, then you can start eating some carbs again, and you keep your weight down."

Janine snorts in laughter. "*Train* your body to burn fat?! Like it doesn't know how already? Come on! If you're gaining weight, it's because you're taking in more calories than you're burning up. Everyone knows that. A calorie is a calorie. It's just a measure of energy in your food. If you want to lose weight, what you have to do is either cut back on the calories you take in or exercise to burn up calories—or both. But why

are we even talking about this? You don't need to lose weight at all, so what are you dieting for, anyway? It's better to like yourself just the way you are."

"What do *you* think?" Mitchell says, turning toward you. "You're taking biology. Don't you think high-protein diets make a lot of sense? You think I should stick with this one?"

"Tell him he's being ridiculous!" Janine insists. "He's going to make himself sick."

Questions

1. First, find out what nutrients Janine and Mitchell are talking about. Using a biology textbook and the resources listed, describe what the following molecules are and what they are used for in the human body. List some specific examples of each. Also list major dietary sources of each.
   a. Proteins
   b. Carbohydrates
   c. Fats
2. Janine made this statement: "… if your brain doesn't get carbs—well, glucose, anyway—you get really cranky. You have to have enough carbs." Find out if Janine is right. How does the nervous system use glucose?
3. Janine also said: "If you eat way too much protein and not enough carbs you can ruin your kidneys forever because of all the nitrogen you have to process breaking down the protein." Find out if Janine is right about this, too. Check a biology textbook for information on protein, fats, and carbohydrates. To find out how these substances can be used for energy, look up information on cellular respiration.
4. The words "calorie" and "energy" come up a lot in discussions of diet and nutrition. Use a biology textbook to define both of these terms. Then suppose you found a product that was labeled "calorie-free energy drink." Why would that label be misleading?
5. Which substances supply energy to the human body?

Resources

USDA My Pyramid:
http://mypyramid.gov/index.html

National Institutes of Health nutrition information:
http://health.nih.gov/topic/Nutrition/WellnessLifestyle
http://health.nih.gov/topic/WeightLossDieting