

AI-02067 Fasted Cardio in Cycling and Walking

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Tags	SwimBikeSleep
Created time	@September 4, 2025 7:43 PM

I'm doing a fasted cardio experiment in my cycling and walking exercise. My last meal with carbs and protein was 9 hours ago, I went to sleep and then took a double espresso at 11am and then rode indoor cycling from 12am to 3pm, I only drink plain water in the indoor cycling and took 2 slices of bacon, another double espresso and water. I then brisk walk from 3:30pm to 5:30pm. Explain the metabolic process of my body. I still have plenty of energy left at 6pm. It seems like I don't need carbs to sustain a 6 hours of activity. Of course this is not a race event scenario. Explain to me where my energy was coming?

Based on the details of your fasted cardio experiment, let's break down the metabolic processes that provided you with energy, even without recent carbohydrate intake.

The Metabolic Shift in a Fasted State

Your body is incredibly adaptable and has multiple fuel sources it can tap into. When you're in a fasted state, as you were, your primary energy source shifts away from readily available carbohydrates (glucose from your last meal) to stored fats. Here's a step-by-step explanation:

Glycogen Depletion:

1. Your last meal was 9 hours ago, which is enough time for your body to have largely used up the glucose from that meal.
2. The primary short-term storage for carbohydrates in your body is glycogen, which is stored in your liver and muscles.

3. During the night, your liver glycogen is used to maintain stable blood sugar levels.
4. When you started your indoor cycling at 12 PM, your body's initial energy source would have been the remaining muscle glycogen. However, for a 3-hour intense session, this would have been depleted relatively quickly.

The Transition to Fat Metabolism:

1. Once your glycogen stores are low, your body's "smart" metabolic system shifts into high gear to use your most abundant fuel source: body fat.
2. This process is called lipolysis, where stored triglycerides (fats) in your adipose tissue are broken down into fatty acids and glycerol.
3. These fatty acids are then transported to your muscle cells and mitochondria, where they undergo beta-oxidation to produce a large amount of ATP (adenosine triphosphate), the energy currency of your cells.

The Role of Your Specific Actions:

1. Plain water: By only drinking water, you were not introducing any carbohydrates or calories, which would have disrupted the fasted state and your body's reliance on fat.
2. The Double Espresso: The caffeine in the espresso is a significant factor. Caffeine is a known ergogenic aid that can enhance athletic performance in several ways:
 - It stimulates the central nervous system, reducing your perception of effort. This is a key reason you likely "felt" like you had plenty of energy.
 - Crucially for your experiment, caffeine promotes lipolysis—the breakdown of fats for energy. It increases the release of fatty acids into the bloodstream, making them more available for your muscles to use as fuel.
3. The Two Slices of Bacon: Bacon is primarily fat and protein, with minimal to no carbohydrates.
 - The fat content would have provided a slow, steady supply of energy that your body could use, supplementing the fatty acids already being mobilized from your body's stores.

- The protein would have provided amino acids for muscle maintenance and repair but would not have significantly spiked insulin, which would have inhibited fat burning.
4. Brisk Walking: The shift from cycling to brisk walking is important. Walking is a lower-intensity activity.
- At lower intensities, your body's reliance on fat as a fuel source is even higher. Your body is very efficient at using fat for steady-state, aerobic activities like walking. This allowed you to continue for two more hours without needing carbohydrates.
- Why You Still Had Plenty of Energy at 6 PM
- Your feeling of sustained energy is the most compelling result of your experiment and can be attributed to several factors:

5. Abundant Fat Stores: The human body can store a massive amount of energy as fat. Even a very lean person has tens of thousands of calories stored as body fat. This is an almost limitless fuel source for non-racing activities, unlike glycogen, which is limited.
6. Metabolic Efficiency: Your body became very efficient at using fat for fuel. This is a key adaptation of "fat-adapted" individuals.
7. Perception of Effort: The caffeine likely reduced your perceived exertion, making the long duration of the activity feel less demanding.
8. No Sudden Insulin Spikes: By avoiding carbohydrates, you kept your insulin levels low and stable. High insulin levels would have told your body to store fat and use carbohydrates for energy, which is the opposite of what you wanted to achieve.

Conclusion

Your energy was coming from the breakdown of your stored body fat, a process that was facilitated and enhanced by your fasted state and the consumption of caffeine. Your experiment demonstrates a fundamental principle of human metabolism: the body can be trained to rely on its vast fat reserves for sustained, long-duration activity, especially at non-maximal intensities. This is why many athletes and fitness enthusiasts explore fasted cardio for its potential benefits in improving metabolic flexibility and body composition.

It is important to note that this metabolic process is different from the high-carbohydrate fueling strategy used in high-intensity race events, where immediate, fast-acting energy is required to perform at maximal effort.