

Starvation

October 28, 2010

Fasting is defined as 8 hours without food.

Although estimates vary, starvation may be considered to start after two days of fasting.

Stages:

1. Glucose levels are maintained by degradation of glycogen (up to 24 hours) - Glucagon levels high.
2. After 24 hrs, proteins and fats begin to be broken down. Only glycerol can be used to make glucose from Fats. Muscle begins to consume more fatty acids for energy, thus preserving glucose for the brain and red blood cells.
3. After a few days, fats are the primary energy source, this can last a couple of weeks depending on fat reserves. Because considerable fatty acids are broken down via Acetyl-CoA and the fact that Oxaloacetate and the Krebs cycle become depressed, acetyl-CoA starts to be converted instead into Ketone bodies (Acetoacetate, hydroxybutyrate, acetone).
4. Ketone bodies rise in the bloodstream, tissues start to switch to using ketones. Heart and muscle are the first to switch in order to preserve glucose. Amino acids, derived from protein breakdown, are converted at an ever increasing rate to glucose.
5. By week two, the brain is switching to ketone usage. By week four or so, the Brain gets 70% of its energy from ketones (These figures can vary according to the source)
6. Once fats are depleted, protein reserves are rapidly degraded, particularly from muscle.
7. Once non-essential proteins have been used up, the body starts to metabolize essential proteins. Very soon, system wide failure of critical functions occurs followed by death.