BIOCHEMISTRY 101: WHAT ARE KETONES AND WHERE DO THEY COME FROM?

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If you are new to the world of ketones and ketone salts, you might have a very basic question, what are ketones and where they come from? So we will start with a lesson from biochemistry 101 that I will try to make as simple as possible. The word "ketone" comes from the German word "keton" meaning acetone, which is your basic fingernail polish remover! This is the very same acetone that is one of the three basic ketone bodies produced in our bodies (I will talk more about that later).

"Atoms" are the basic particles of matter. The basic atoms in living matter are oxygen, hydrogen and carbon. Atoms are connected to each other by "bonds" that are sort of like magnetic attractions. When two or more atoms are connected, they are called "molecules". Glucose (sugar), fats and ketones are made of different combinations of oxygen, hydrogen and carbon. The carbon atoms line up in a chain and the hydrogen and oxygen atoms attach to the carbon atoms. The positions of the atoms in a molecule determine what it does in the body.

Glucose starts with a chain of six carbons with hydrogens and oxygens attached to them and is the main fuel for the cells in our body when we are on a higher carbohydrate diet. Betahydroxybutyrate is one of the three ketones made in the body and starts with a chain of four carbons with hydrogens and oxygens attached. There are two forms of betahydroxybutyrate that have a different shape – the simplest way to think of them is as mirror images. D-betahydroxybutyrate is found mainly in the bloodstream and L-betahydroxybutyrate is found mainly in mitochondria where energy, called ATP, is produced in our cells. There are two other ketones, one called acetoacetate and the other called acetone (finger nail polish remover!), which evaporates easily and is mostly exhaled. Acetone accounts for the fruity breath people may have when they are in ketosis (meaning when blood ketone levels are elevated). Acetoacetate converts easily to betahydroxybutyrate and vice versa. Acetoacetate also breaks down to acetone.

Endogenous ketones are ketones that originate inside of our bodies. The most common way that we experience ketosis is when we do not eat for 10 or 12 hours overnight; we will often be in mild ketosis in the morning until we eat something with carbohydrates (sugar) in it. Ketosis becomes much more pronounced over days to weeks in people who are fasting intentionally, starving, or on a high-fat low-carbohydrate diet. In this situation, we begin breaking down fat into fatty acids after the glucose that is stored in our body is used up, usually within 36 to 48 hours. These relatively large fatty acids do not cross very well into the brain, however they are broken down in the liver to ketones. The cool thing about ketones is that they do cross the blood brain barrier and provide fuel to the cells in our brain as well as in our other organs (except in the liver where they are made). Both glucose and ketones enter the same chemical pathway that leads to producing ATP, however ketones enter this pathway several steps downstream from where glucose enters. Because of this, ketones can serve as an alternative fuel to the brain and other organs when there is a problem using glucose for fuel.

Exogenous ketones originate from outside of the body. Pruvit ketone salts, Keto//OS and KetoMax, are natural exogenous ketones and are the first products to be widely marketed to the public that contain the actual ketone betahydroxybutyrate!

For more information and to print more copies see: www.coconutketones.com