

PREVIEW 2 - Ben Bikman (Denver 2019)

Prof. Ben Bikman: And now we're going to talk about oxygen use as evidence of fuel use, the rate at which the mitochondria are working because of mitochondria are working they are using oxygen and then we'll look at the production of ATP, the productive aspect of what the mitochondria are trying to do.

Now in this case, as you know, this audience knows better than most, if fat catabolism or fat use is very high for very long, we begin to produce these small little molecules called ketones. Interestingly when someone is an active ketogenesis and thus ketosis or getting to what we would define classically as ketosis that production of ketones accounts for almost half of all of the oxidation of fats.

So, someone's burning fat like gangbusters, so to speak, almost half of that is actually going to the production of ketones, a pretty meaningful amount. Of course, this can only happen when insulin is low and in fact that is what got me involved in ketones in the first place a few years ago.

I'm an insulin guy at my core but you can't really separate the ketones from the insulin. Well nowadays we do with supplements, but those two things are inversely related. And of course the gist of it, the biochemistry in a very simple way is that as fat is low the oxidation or the burning of a-- sorry as insulin is low, the burning of fat is so high that you start to accumulate a lot of Acetyl-CoA.

Acetyl-CoA represents this very relevant kind of branch point in biochemistry which can go all kinds of different ways because insulin is low it cannot go to lipogenesis and be used to create fat. Also, because there's so much Acetyl-CoA, it inhibits its own entry into the citrate cycle.