

PREVIEW 2 - David Ludwig (Denver 2019)

Prof. David Ludwig: So this group understands a basic principle that the physiological adaptations to a low-carb diet don't occur immediately. How do we know that? Well, just look at fasting. That's one of the most potent stimuli for ketogenesis.

Beta-Hydroxybutyrate takes three weeks or more to reach steady state. Look at, you know, six days, see where six days would be, you're barely half the way there and the same is true for low versus high-carb diets, these instances are weight reducing lower high-carb diet.

You know by one week you're barely half the way to steady state ketones. And so, if you are habituated to a high carbohydrate diet and you suddenly are put on a low carbohydrate diet, you know, your brain was reasonably happy within limits that we've discussed with the glucose that is provided on that high carbohydrate diet.

Now you've just shut off the glucose supply. We know that's not going to be a problem long term because ketones rise and serve as an ultimate alternative fuel. But what happens during those first few weeks when you've turned off the glucose but yet your ketones haven't reached steady state? How do you feed the brain? From your muscles.

So you've got to break down some protein for gluconeogenesis temporarily and we see that in this study nitrogen balance which is reflecting muscle amino acids is more negative. This is not a big deal.

It means that when you start a low-carb diet, and this might be modifiable a little bit based on how much protein you consume, but you can expect to lose about a pound of lean mass as you adapt. That has no implications to long term because by one month we're back to balance.

But it means if you study people at three days, six days, nine days, or 12 days they're going to look like a metabolic mess and of course you're not going to necessarily see optimal long term chronic effects.