

DIET KETOSIS and KETOACIDOSIS for DUMMIES

THE FACTS :

- Fats (lipids) are burned by the **Body at rest** 70% Glucose 30% and a trace of Proteins the body's Aerobic (with Oxygen) cycle(4)
 - The body's Cells furnace (the Mitochondria) uses FATS (Lipids as fuel) but needs Carbohydrate (Glucose) to fire up the whole cycle .
this is a cycle called the Krebs Cycle (citric acid cycle) the Cells engine the Mitochondria conducts a series of enzyme biochemical reactions (enzymes by the way are usually amino acids) example of an amino acid fat transporter is Acetyl I- Carnitine (ACL) that transports Fats(lipids) into the mitochondria where further enzymes breakdown the fats (lipids) and produce ADP Adenosine tri (3phosphates) and Di-phosphate (2 phosphates) as a result ENERGY IS RELEASED for muscle function throughout the body. (4)
 - So the **BODY NEEDS COMPLEX CARBS** (example Sweet potatoes/Basmati Rice) which are slowly released into the blood stream to FIRE UP the Fat (lipid) burning biochemical process in the body cell furnace the Mitochondria in **ORDER TO BURN FATS (3) and some simple sugars** (especially during exercise bouts)
 - **THE SECRET IS TO KEEP CARBS RELATIVELY LOW (150 GRAMS)** approximately depending on your activity (for example if you are a marathon runner or distance swimmer your carb consumption would be considerably higher according to the activity.
 - **KETOSIS** is always going on in the body in a controlled manner when Glucose is unavailable for the body's cells and is a dangerous/toxic effect in the blood stream (however the bodies normal blood buffer system neutralizes the Ketones rendering them harmless in most cases.
HOWEVER KETOACIDISIS OCCURS WHEN THE BOOD ACCUMILATES Ketones and this is VERY DANGEROUS TO THE BODY as the blood cannot buffer the 'ACIDS'(ketoacidosis) and therefore they accumulate and the PH of the blood changes from a normal range.(PH is the acid-base balance in the body PH 7 is normal)
THIS CAN RESULT IN DIABETIC COMA and DEATH (3) and other serious Health ISSUES due to the dramatic change in the blood PH levels which are critical in the body's biochemistry (I small change can have very serious 'knock on effects').
HOMEOSTASIS (the body's biochemical balance) of the bodies Blood and cells is critical in a normally functioning Human.(4)(3)(2)(1)
WHY ALL THE HYPE ON KEYTONE DIETS ?
Just Marketing Bull-s basically the science on Ketones is as old as Methuselah its just the "Dummies" who get sucked into this unhealthy stupidity and believe the Marketing Hype .
KETOACIDISIS can be FATAL thats the FACT you should burn into your MIND.
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- **WHAT IS THE CORRECT APPROACH ?**
Firstly you need Carbohydrates (Complex) in controlled small amounts as described above and some simple sugars during a work out .
- **FATS are BURNED AFTER THE WORKOUT** actually the 24 hour cycle in between exercise bouts is where you burn 80-90% of your FATS at REST (but your metabolism is still revved up ,repairing muscle , etc
- **OUR ADVISE** keep the complex carbs between (100 to 150 grams per day) depending if your a marathon runner or distance swimmer you may increase accordingly.
- **AMINO ACIDS and PROTEIN Drinks ?**
Yes you absolutely need these in a balanced approach , because they will be absorbed into the Blood stream in 10 minutes or so from consumption, in the case of Amino Acids absorbed almost straight away into the blood stream.
we recommend URBAN MUSCLE Amino ACIDS and Protein Drinks .
- **CONCLUSION**
Balance is the KEY not MARKETING HYPE of a science that has been know by biochemists and Doctors for 50 years or more , so nothing new here so don't get caught up in the bull-s.
Talk to one of our **URBAN MUSCLE CONSULTANTS** who have build our product range on the balanced scientific approach.

By Graham Healy

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Further Reading and References :

Ketone bodies are three **water-soluble molecules** (acetoacetate, beta-hydroxybutyrate, and their spontaneous breakdown product, acetone) that are produced by the liver from fatty acids^[1] during periods of low food intake (fasting), carbohydrate restrictive diets, starvation, prolonged intense exercise,^[2] or in untreated (or inadequately treated) type 1 diabetes mellitus. These ketone bodies are readily picked up by the extra-hepatic tissues, and converted into acetyl-CoA which then enters the citric acid cycle and is oxidized in the mitochondria for energy.^[3] In the brain, ketone bodies are also used to make acetyl-CoA into long-chain fatty acids.(1)

Ketosis and ketoacidosis

In normal individuals, there is a constant production of ketone bodies by the liver and their utilization by extrahepatic tissues. The concentration of ketone bodies in blood is maintained around 1 mg/dl. Their excretion in urine is very low and undetectable by routine urine tests (Rothera's test).^[citation needed]

When the rate of synthesis of ketone bodies exceeds the rate of utilization, their concentration in blood increases; this is known as *ketonemia*. This is followed by *ketonuria* – excretion of ketone bodies in urine. The overall picture of ketonemia and ketonuria is commonly referred as **ketosis**. The smell of acetoacetate and/or acetone in breath is a common feature in ketosis.

When a type 1 diabetic suffers a biological stress event (infection, heart attack, or physical trauma), or fails to administer enough insulin they may enter the pathological state of hyperglycemic ketoacidosis. Under these circumstances, the low or absent insulin levels in the blood, combined with the inappropriately high glucagon concentrations,^[14] induce the liver to produce glucose at an inappropriately increased rate, causing acetyl-CoA resulting from the beta-oxidation of fatty acids, to be converted into ketones bodies. The resulting very high levels of ketone bodies lower the pH of the blood plasma which reflexively triggers the kidneys to excrete a very acid urine. The high levels of glucose and ketones in the blood also spill, passively, into the urine (the ability of the renal tubules to reabsorb glucose and ketones from the tubular fluid, being overwhelmed by the high volumes of these substances being filtered into the tubular fluid). **The resulting osmotic diuresis of glucose causes the removal of water and electrolytes from the blood resulting in potentially fatal dehydration.**

Individuals who follow a low-carbohydrate diet will also develop ketosis. This induced ketosis is sometimes called **nutritional ketosis**, but the level of ketone body concentrations are on the order of 0.5-5 mM whereas the pathological **ketoacidosis** is 15-25 mM.⁽¹⁾

The process of ketosis is currently being investigated for efficacy in ameliorating the symptoms⁽¹⁾ of **Alzheimer's disease**.^[15]

References :

(1)https://en.wikipedia.org/wiki/Ketone_bodies#Ketosis_and_ketoacidosis

(2)page 845 Organic Chemistry by Janice Gorznski Smith

(3)page 43-49,54,97. Diet Dilemma by Rosemary Stanton

(4)page 22-24 The Physiological basis of Physical Education and athletics by Edward Fox and Donald mathews

refer further general references on www.healyshealth.com