

'Keto-adapt' your clients in 3 months in 8 easy steps

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Personal journey



2013



2009

2012

What we're not talking about...

Upon examination of the literature, the **majority of studies report decreases in fat-free mass in individuals** following a ketogenic diet. However, some confounding factors exist, such as the use of aggressive weight loss diets and potential concerns with fat-free mass measurement. A limited number of studies have examined **combining resistance training with ketogenic diets**, and further research is needed to determine whether resistance training can effectively slow or stop the loss of fat-free mass typically seen in individuals following a ketogenic diet. **Mechanisms underlying the effects of a ketogenic diet on fat-free mass and the results of implementing exercise interventions in combination with this diet should also be examined.**

Tinsley GM, Willoughby DS. Fat-Free Mass Changes During Ketogenic Diets and the Potential Role of Resistance Training. *Int J Sport Nutr Exerc Metab.* 2015 Aug 12. [Epub ahead of print]

Multi-modal interventions

ENDOCRINOLOGY

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Therapeutic prospects of metabolically active brown adipose tissue in humans

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The world-wide obesity epidemic constitutes a severe threat to human health and wellbeing and poses a major challenge to health-care systems. Current therapeutic approaches, relying mainly on reduced energy intake and/or increased exercise energy expenditure, are generally of limited effectiveness. Previously believed to be present only in children, the existence of metabolically active brown adipose tissue (BAT) was recently demonstrated also in healthy human adults. The physiological role of BAT is to dissipate chemical energy, mainly from fatty acids, as heat to maintain body temperature in cold environments. Recent studies indicate that the activity of BAT is negatively correlated with overweight and obesity, findings that raise the exciting possibility of new and effective weight reduction therapies based on increased BAT energy expenditure, a process likely to be amenable to pharmacological intervention.

Diet or state?

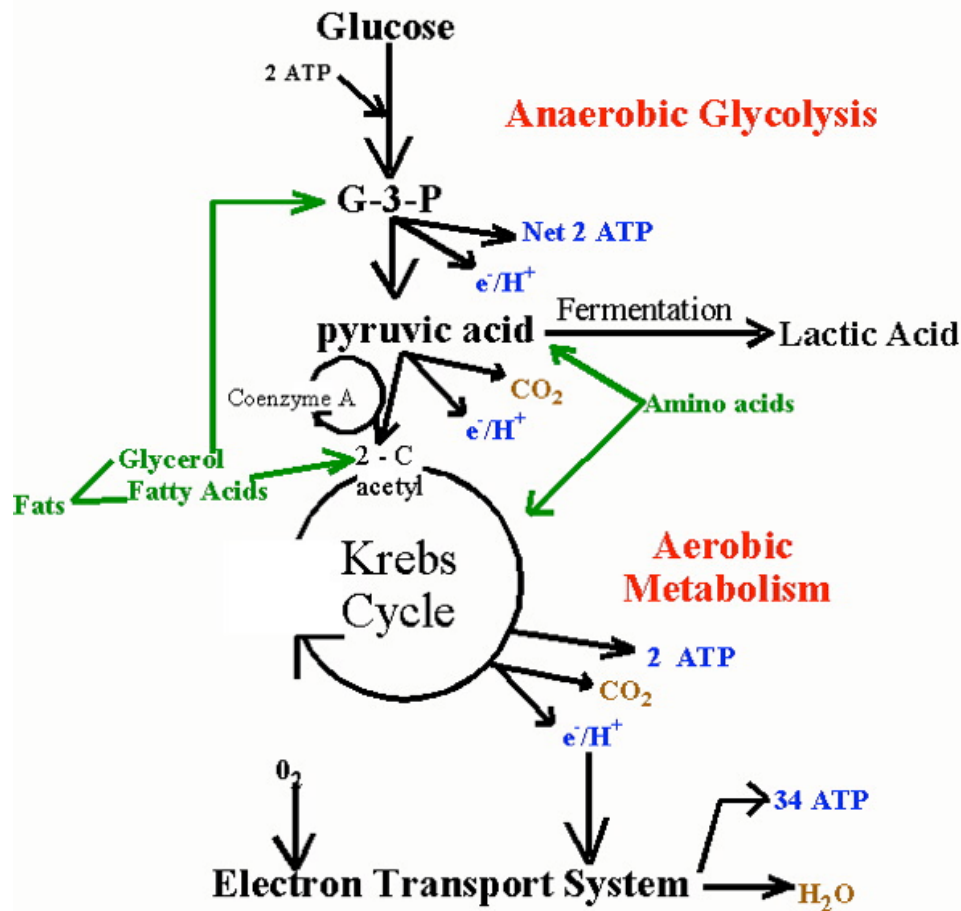
- * Ketosis: long-term or cyclic?
- * KD, Low Carb diet, Very Low Carb, Cyclic KD
- * Effects on body composition: fat vs muscle mass
- * CKD + Intermittent Fasting + Physical Activity
- * Nutritional ketosis vs starvation-induced ketosis



Traits among the keto-adapted

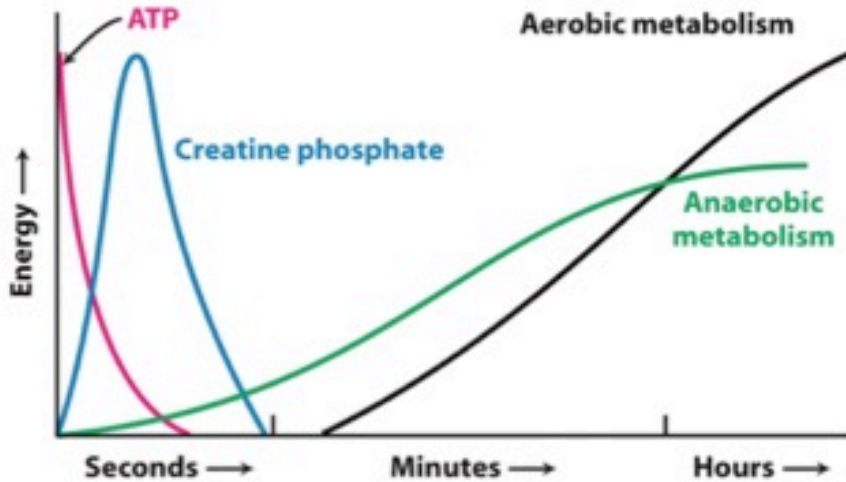
- * Can readily burn fats for fuel
- * Regularly practice caloric restriction and intermittent fasting
- * Physically active
- * Diet is anti-inflammatory and loaded with phytonutrients from the 6 main colour groups of the phytonutrient spectrum
- * Bulk of their diet energy in keto phase from fat
- * Metabolic risk = v low as measured by bloods or BC (muscle/adipose/visceral fat ratios)
- * Nutrition and lifestyle adapted around genetic and other limitations
- * Metabolic + psychoemotional flexibility

Metabolic fuelling basics



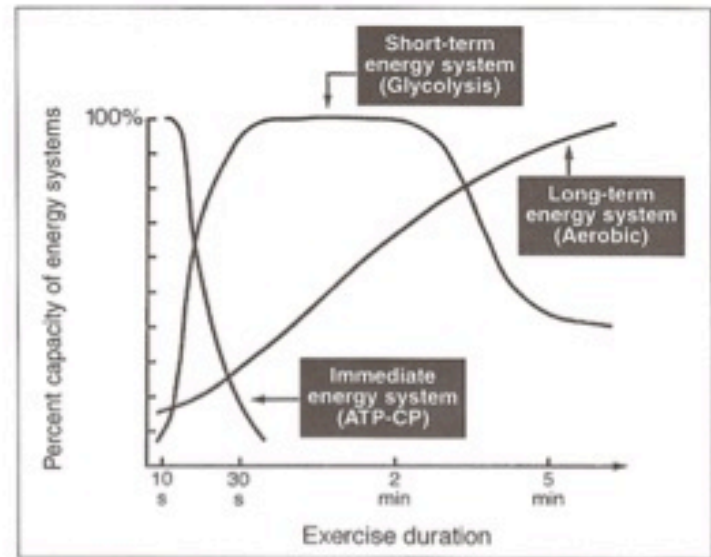
Metabolic flexibility is key

Your 3 energy systems



Biocchemistry, Seventh Edition
© 2012 W. H. Freeman and Company

Figure 3-1: The three systems of energy transfer and their percentage contribution to total energy output during all-out exercise of different durations.



Reference: McArdle, Katch and Katch. (1996). *Exercise Physiology. Energy, Nutrition and Human Performance*. Williams & Wilkins, Maryland. p. 190.

1. Phosphagen or ATP-CP system
2. Anaerobic / Fast glycolysis
3. Aerobic / Slow glycolysis + Krebs/TCA cycle
+ Electron Transport Chain (oxidative phosphorylation)

Theoretical E yield

- * Creatine phosphate: a lactic/anaerobic

1 ATP

- * Glucose: lactic acid/anaerobic

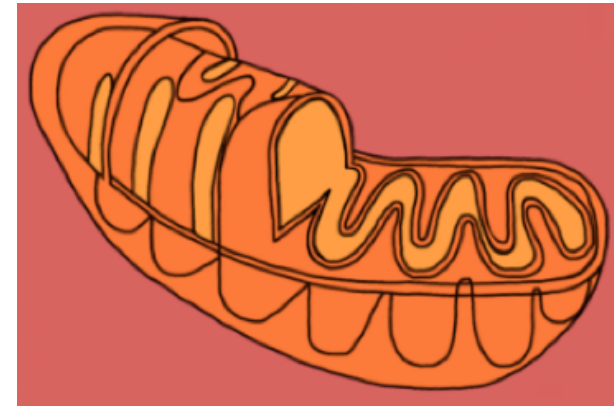
2 ATP

- * Glucose: lactic acid/aerobic

36 ATP

- * Fatty acids (beta-oxidation): a lactic/aerobic

129 ATP



Mitochondria

- Bacterial origin
- Average 1000 in each muscle cell
- Regular activity generates new mitochondria

Energy from your fuel stores

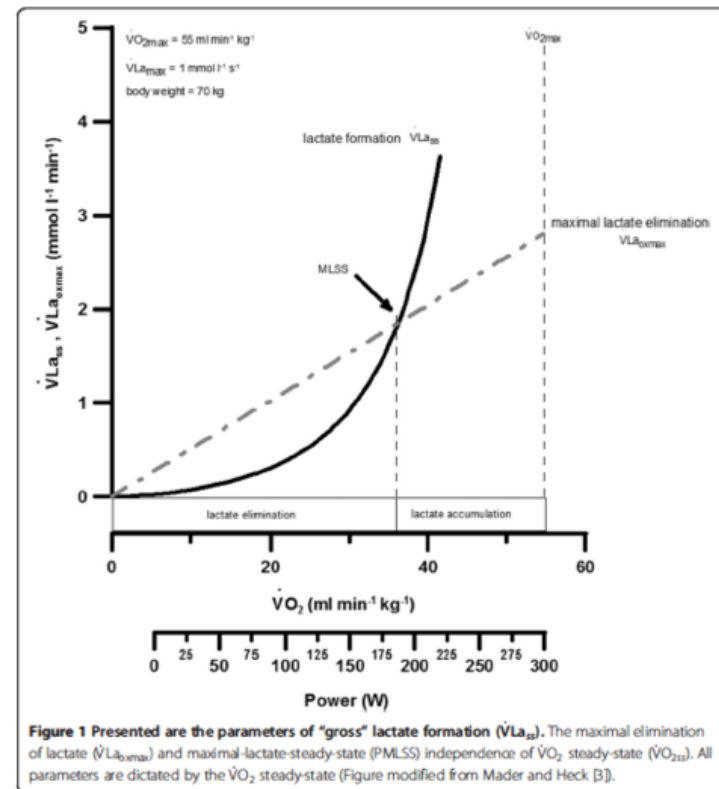
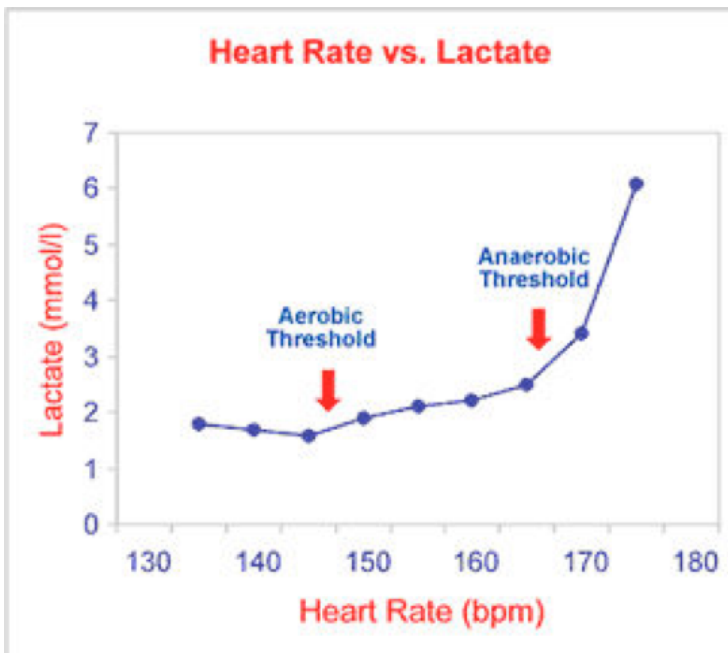
Fuel source	Maximal rate of <u>ATP</u> production (mmol/s)	Total ~P available (mmol)
Muscle <u>ATP</u>		223
Creatine phosphate	73.3	446
Conversion of muscle glycogen into lactate	39.1	6,700
Conversion of muscle glycogen into CO ₂	16.7	84,000
Conversion of liver glycogen into CO ₂	6.2	19,000
Conversion of adipose-tissue fatty acids into CO ₂	6.7	4,000,000

Note: Fuels stored are estimated for a 70-kg person having a muscle mass of 28 kg.

Source: After E. Hultman and R. C. Harris. In *Principles of Exercise Biochemistry*, J. R. Poortmans (Ed.). (Karger, 1988), pp. 78–119.

Threshold training

- * Aerobic metabolism
- * Anaerobic threshold
- * Lactate threshold
- * Anaerobic metabolism



Training for your 3 E systems

Phosphagen system

- * 2 sets of 8 x 5 seconds at maximal with 3:00 passive rest and 5:00 rest between sets
- * 5 x 10 seconds at maximal with 3:00–4:00 passive rest

Anaerobic (fast glycolysis)

- * 'Sprint-8' type: 8–10 x 30 seconds fast with 1:00 active recovery
- * 4 x 1:30 fast with 3:00 active recovery

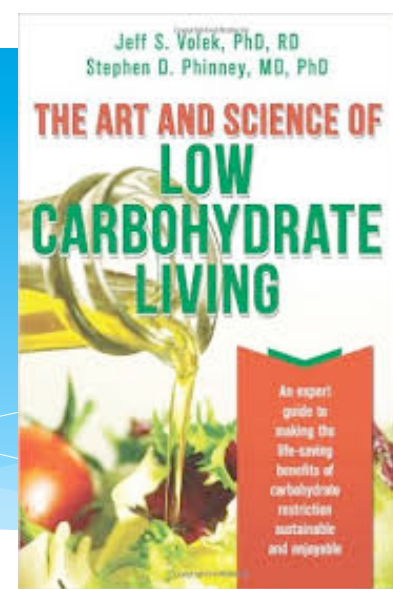
Aerobic

- * Long, steady activity
- * 60+ (pref 90+) minutes at 70%–75% maximum heart rate
- * 15- to 20-minute tempo workout at lactate threshold intensity (about 80%–85% maximum HR)
- * 5 x 3:00 at 95%–100% maximum heart rate with 3:00 active recovery

Contraindications for KD

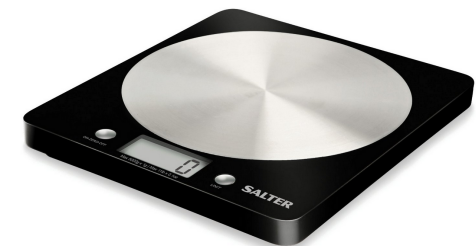
- * History of pancreatitis
- * Active gall bladder disease
- * Impaired liver function
- * Impaired fat metabolism/digestion
- * Poor nutritional status
- * Gastric bypass surgery
- * Abdominal tumours
- * Decreased gastrointestinal motility (e.g. in conjunction with conventional cancer treatment and associated drugs)
- * History of kidney failure

Helpful hardware (mostly optional)

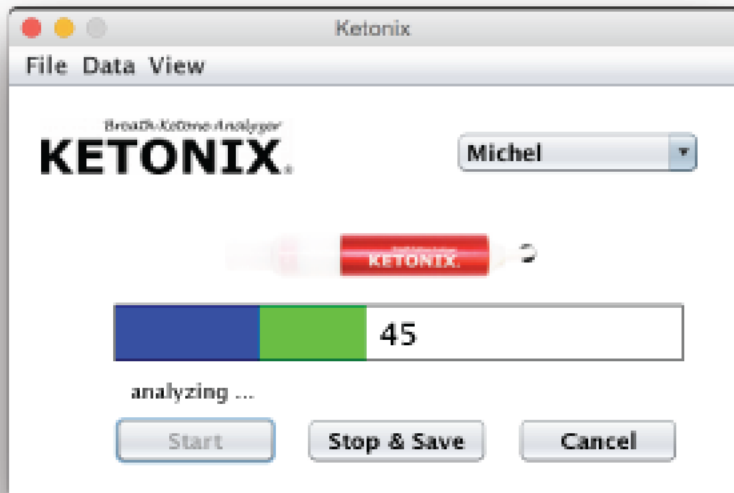


- * Food balance
- * Body composition scale (e.g. Tanita BC 545N)
- * Physical activity monitor (e.g. Suunto Ambit)
- * Reference book (e.g. Volek & Phinney, 2011)
- * Ketonix device (optional)

TANITA



Ketonix



ANH Food4Health plate

The ANH Food4Health Plate

January 2015

Percentages refer to amounts by weight of each food category



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Consume daily vegetables and fruits belonging to all 6 colour groups: Green, Orange, Blue/Purple, Red, Yellow, White/Tan

Include consumption of at least some fermented vegetables e.g. sauerkraut, kimchi

General guidelines

- Minimise consumption of any highly processed foods
- Do not use high-temperature cooking methods (frying, grilling), unless brief
- Minimise heat-damage to proteins, fats and vegetables by consuming plenty of raw foods and/or using slow cooking methods
- Use organic extra virgin coconut oil as your 'go to' fat for stir-frying or other cooking
- Consume plenty of fresh herbs and non-irradiated, organic spices
- Leave at least 5 hours between meals (avoid snacking between meals)
- Consume at least 1.5 litres of spring or filtered water daily, between meals
- Avoid all foods which trigger intolerance or allergy
- Seek advice from a qualified and experienced health professional on the most appropriate supplements (concentrated sources of nutrients)



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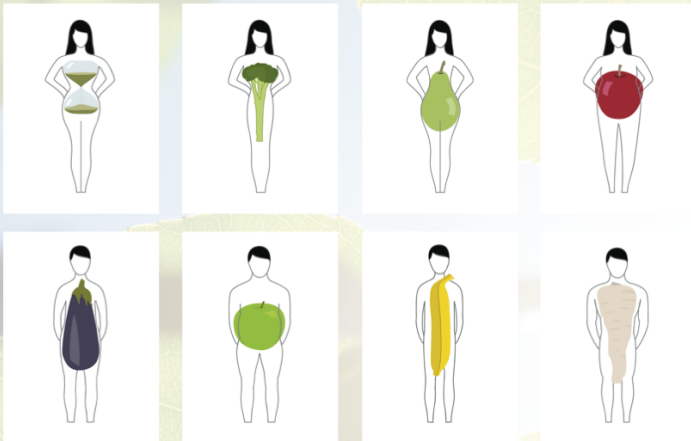
#Food4Health

Additional resources

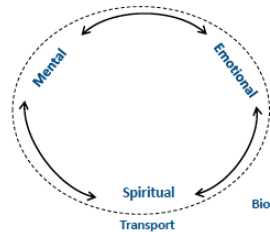
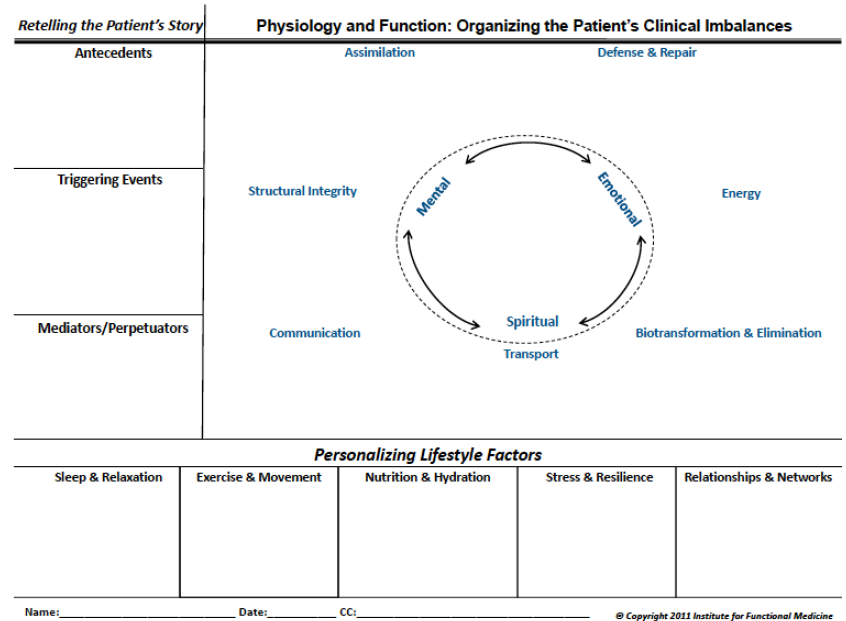


Bite the Sun is an information-rich searchable site for health, wellbeing, life and activity related nuggets and if you can't find what you're looking for, reach out and ask our Bite Hub community!

Body types



Body condition



www.bitethesun.org
www.functionalmedicine.org

Classic KD

	Energy	1500 kcal/d	
	%	kcal	Grams
Carbs	10	150	38
Protein	20	300	75
Fat	70	1050	117
Total	100	1500	230

Early adaptation phase

- * Know how you will feel
- * Strict ketosis phase: 30 days
- * Minimize activity in early adaptation phase
- * Don't give up!

Carb-refeed phase

- * Don't start until Month 2
- * Deplete and replete glycogen stores
- * Key before endurance activity
- * Up-regulate hormones and thyroid activity
- * Gives psychological "break" that increases overall compliance on CKD
- * Enjoy!

4 essentials to Cyclic Keto LS

1. Understand your body and your body composition
 - SNP, genetic/polymorphism tests (e.g. DNA Life, Nordic Labs)
 - current BC, metabolic risk, health status; antecedents, triggers, perpetuators (e.g. use FM Matrix)
2. Choose your physical activities
3. Clear your house of refined carbs, grain products and stock with healthy fats (Extra Virgin Coconut Oil, Extra Virgin Olive Oil; seeds, tree nuts)
4. Learn to plan: nutrition + activity + rest (BTS)

8 steps to CKLS (1-4)

1. Set your goals
2. Preparation: baseline BC, go entirely grain-free during KD phase; gluten-containing grain-free in glycogen repletion phase
3. Timing/Planning: Maintain >5h between food; >12 h fasts 6 d/w; don't eat within 2 h of bed, select carb refeed times carefully
4. Sleep: Plenty (6-9h, depending on individual, stress, etc)

8 steps to CKDLS (5-8)

5. Food & water: Use F4H plate as your average plan - maintain dietary diversity
6. Physical activity: Alternate resistance/strength and endurance/CV training, train twice weekly in fasted state; include 1-3 sessions HIIT/w
7. Monitoring: Monitor body composition, dietary intake and physical activity
8. Adjust/fine-tune your programme
 - We're each individual!



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