

A stylized graphic featuring a white fork on the left and a white plate on the right, both outlined in thick black. The background is black. The text is centered on the plate.

Keto for Cancer: Insider Tips for a Simple Keto Life

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A person from the waist down is shown wearing a light green t-shirt and blue jeans. They are pulling out the pockets of their jeans with both hands. The text "Nothing to Disclose" is overlaid in the center of the image in a bold, black, sans-serif font.

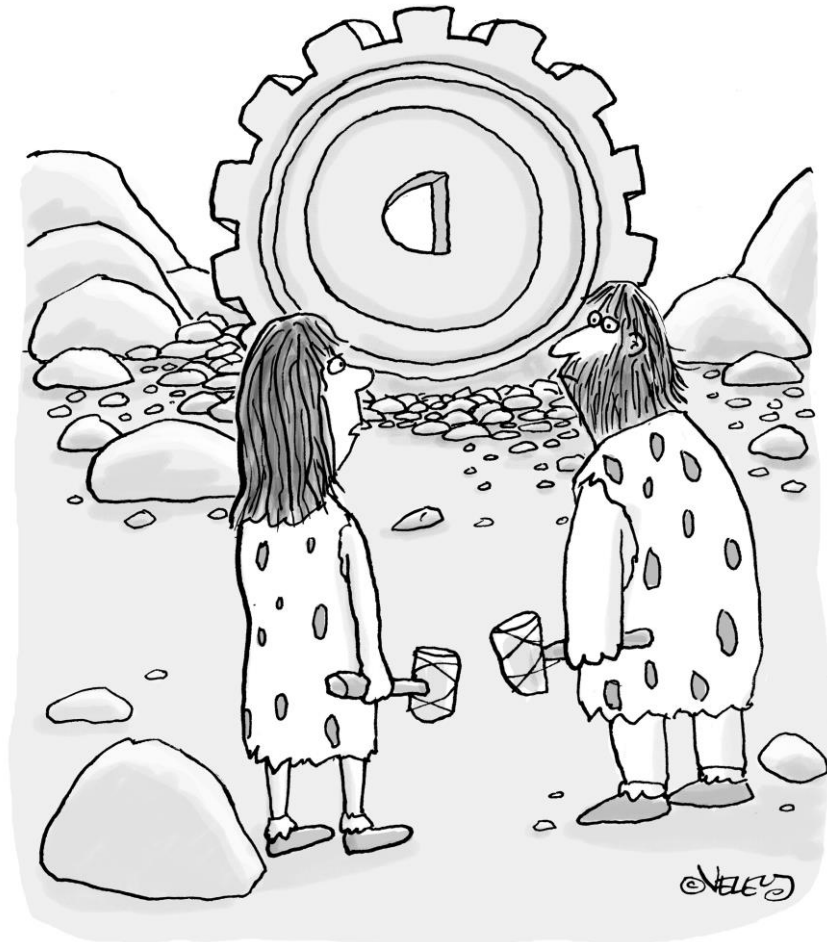
Nothing to Disclose

Raffi Kalamian Walsh

Born February 18, 2000

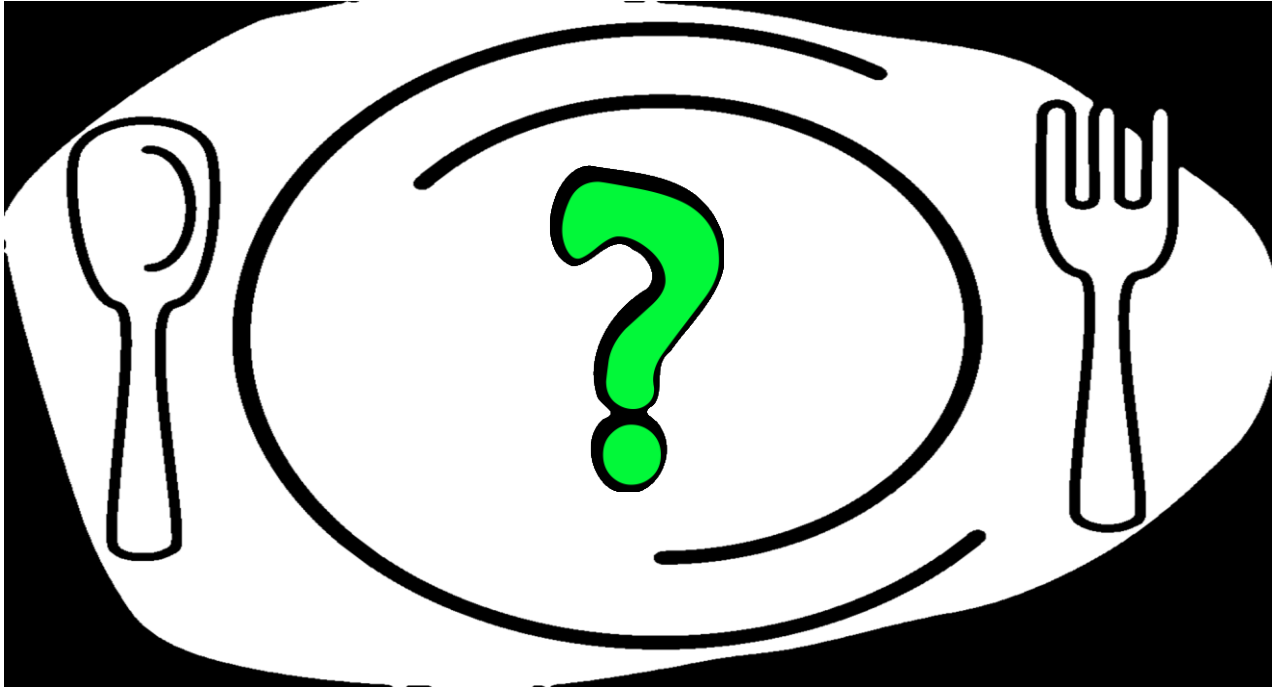
Died April 17, 2013



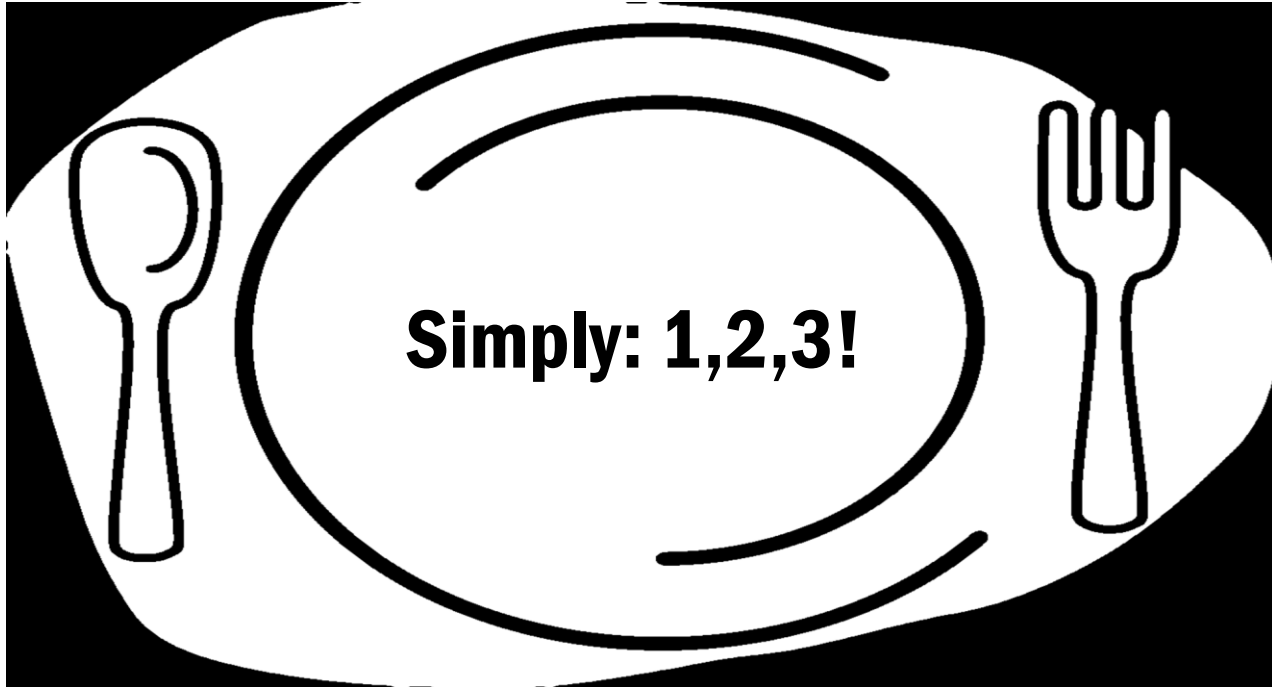


“Are we overthinking this?”

What is Keto for Cancer?



What is Keto for Cancer?



1. Targeted Nutritional Strategy

- ✓ Very low in carbs
- ✓ Sufficient in protein
- ✓ Very high in fats

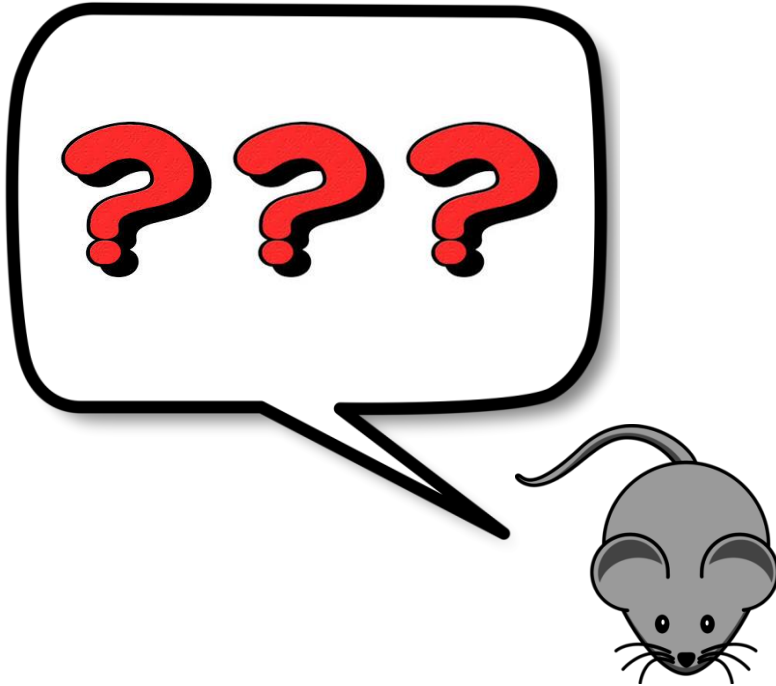
2. Mimics Fasting/Starvation

- ✓ Lowers the availability of fermentable fuels
- ✓ Facilitates changes to gene expression (epigenetics)
- ✓ Alters signaling in nutrient-sensing pathways

3. Metabolic Therapy

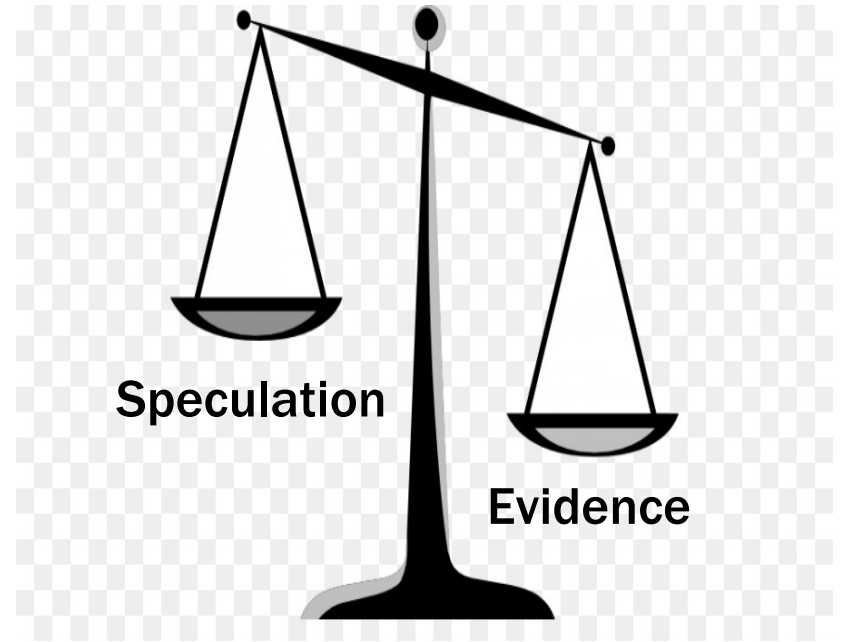
- ✓ Stand-alone therapy for pre-cancer diagnosis or “watch & wait”
- ✓ Adjunct to conventional and/or alternative treatments
- ✓ Non-toxic with known side effects, most of which are easily resolved

Where's the Evidence?



Tipping the Scales

- Animal model research
- Case studies
- Literature reviews
- Clinical trials
- Shared clinical outcomes



Clinical Trials

A Study of Ketogenic Diet in Newly Diagnosed Overweight or Obese Endometrial Cancer Patients

Memorial Sloan Kettering & Weill Medical College; New York, NY

Ketogenic Diet in Children With Malignant or Recurrent/Refractory Brain Tumor

Nicklaus Children's Hospital; Miami, FL

Comparison of Healthy Diets on Breast Cancer Markers (KetoBreast)

Albert Einstein College of Medicine: New York, NY

Ketogenic Diet in Combination With Standard-of-Care Radiation and Temozolomide for Patients With Glioblastoma

Cedars-Sinai Medical Center; Los Angeles, CA

Search of Ketogenic + Cancer on May 5, 2018 yielding 28 trials.

<https://https://clinicaltrials.gov/ct2/results?cond=cancer&term=ketogenic+diet&cntry=&state=&city=&dist=>

A Three-Pronged Metabolic Approach

Carbohydrate Restriction

(induces ketosis)

Protein Management

(inhibits cancer progression)

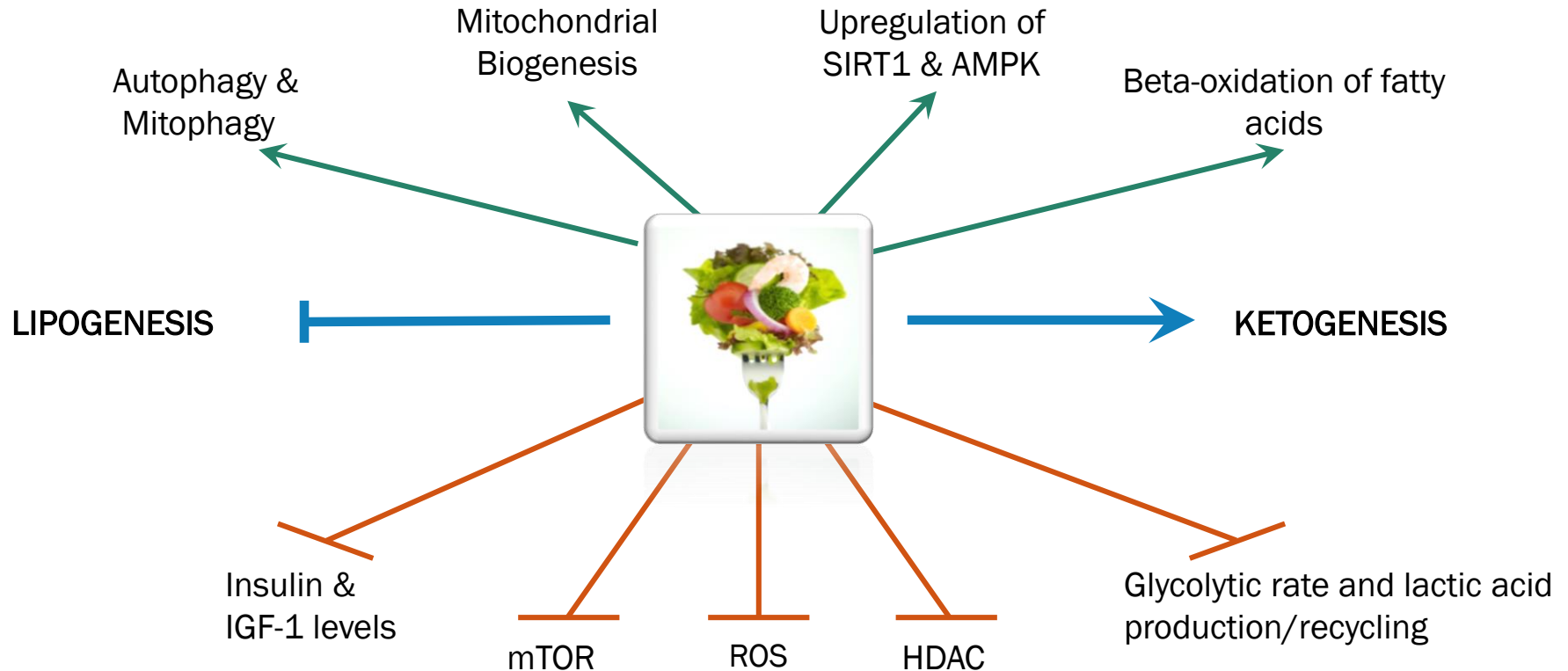
Calorie Restriction

(induces angiogenesis)



Klement RJ, Champ CE. Calories, carbohydrates, and cancer therapy with radiation: exploiting the five R's through dietary manipulation. *Cancer Metastasis Reviews*. 2014;33(1):217-229.

Epigenetic Influences of a Ketogenic Diet



High-Fat Diet is *not* a Keto Diet



Black 6 (C57BL/6)

PubMed search of C57BL/6 and High-Fat Diet yields 1767 studies

<http://www.ncbi.nlm.nih.gov/pubmed/?term=C57BL%2F6+high+fat+diet>

Accessed May 5, 2018

High-Fat Chow

45% Fat
20% Protein
35% Carb

Half the carbs
come from sucrose

<http://www.researchdiets.com/opensource-diets/diet-induced-disease-models/obesity>

Chocolate Brownie

49% Fat
5% Protein
47% Carb

Over half the carbs
come from sucrose

<https://www.verybestbaking.com/recipes/32212/layers-of-love-chocolate-brownies/>

“First Do No Harm”

- Rule out absolute contraindications
- Address relative contraindications
- Acknowledge challenges
- Set realistic goals

Know Your Client

- Preferences
- Intolerances
- Allergies
- Aversions
- Time/energy constraints
- Social influences
- Cultural expectations

Image Credit: angelsimon / 123RF





**Let's Talk
Food!**

Classic Keto

CARBS

PROTEIN



FAT

Image credit: jules.stonesoup

Plant-based

CARBS

Veggies



**PROTEIN
& CARB**

Tofu

FATS

Oil-based
dressing

Zero Carb

PROTEIN

Meat & more meat



CARBS

Zero

FAT

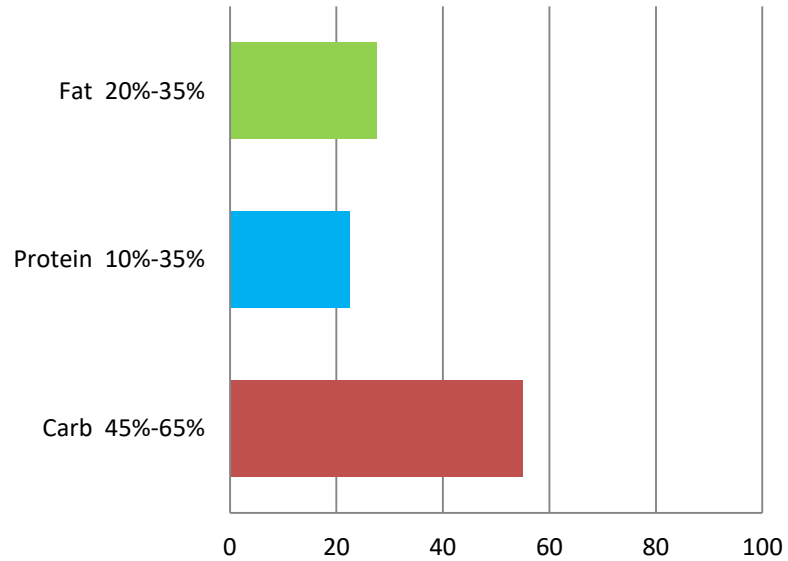
Meat drippings

One Happy Kid!

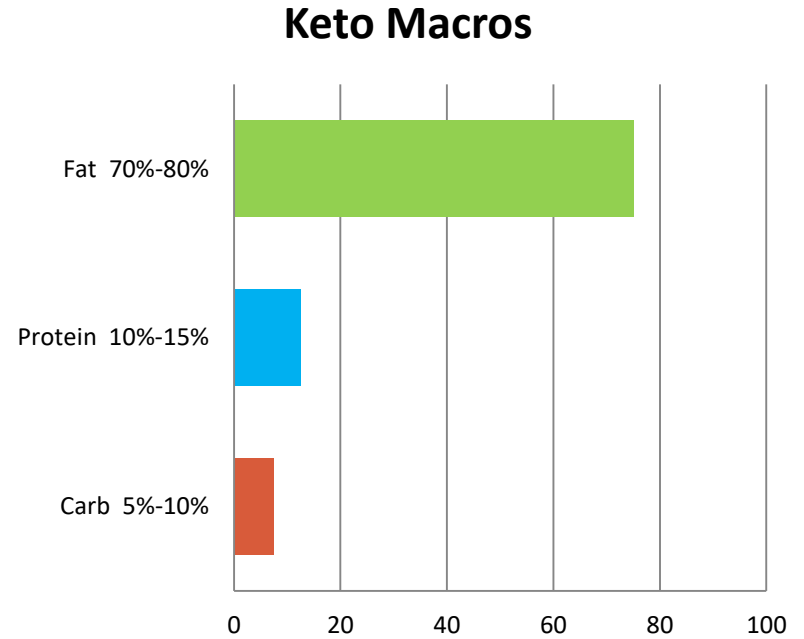


Compare macros

Standard Diet Macros

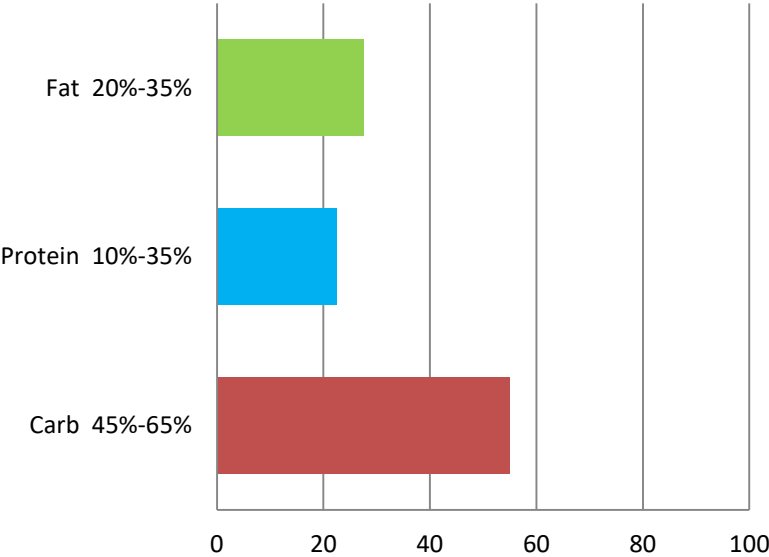


Compare macros

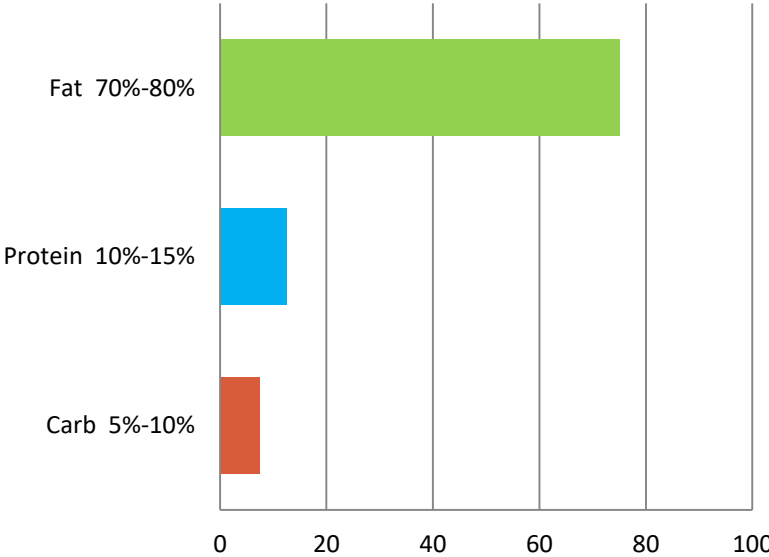


Compare macros

Standard Diet Macros



Keto Macros





“Let me have 80% fat, 15% protein, 5% carb
and a cup of tea.”

Calculate Macros

Step #1:

Set a **carb limit** (12 to 25 grams)



Calculate Macros

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Set a **carb limit** (12 to 25 grams)

Step #2:

Calculate the **protein target**
(1.0 g/kg of ideal body weight)



Calculate Macros

Step #1:

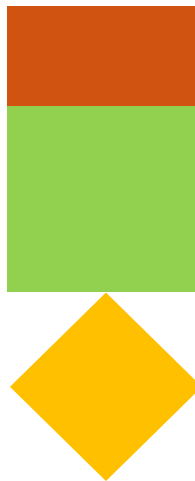
Set a **carb limit** (12 to 25 grams)

Step #2:

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Step #3:

Fat intake reflects needs



Calculate Macros

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Set a **carb limit** (12 to 25 grams)

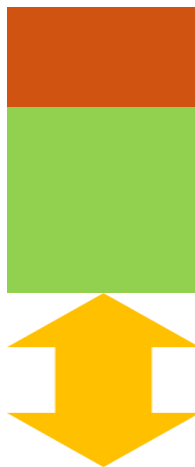
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Fat intake reflects needs

- Less if weight loss is desirable



Calculate Macros

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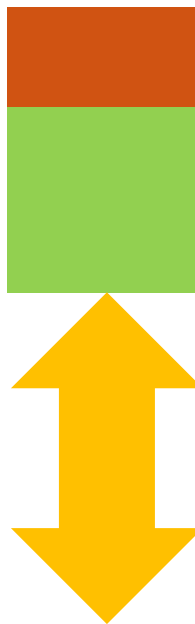
Step #2:

Calculate the **protein target**
(1.0 g/kg of ideal body weight)

Step #3:

Fat intake reflects needs

- Less if weight loss is desirable
- More for those who need to maintain or stabilize weight

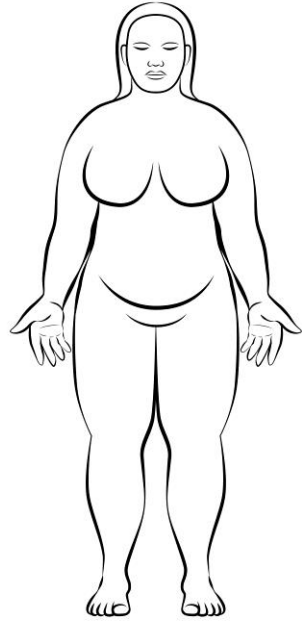
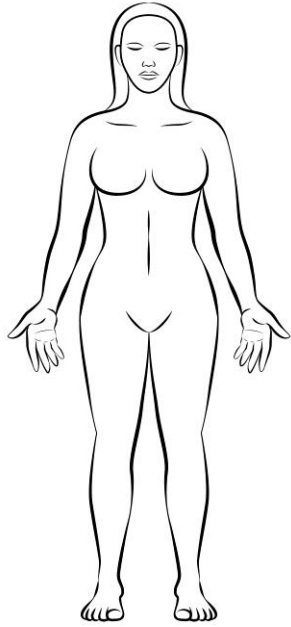
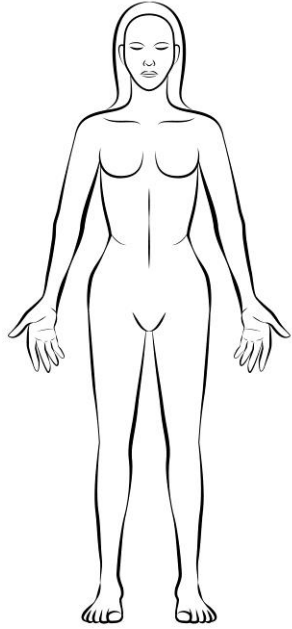


Protein

Minimum of 1.0 g/kg of lean body mass

- ▲ Older adults
- ▲ Nutritionally compromised
- ▲ Sarcopenic/Cachexic
- ▲ Athletes, during & immediately after exercise
- Use RDA for pregnant/lactating women
- All proteins stimulate the production of insulin
- Excess protein may drive cancer progression



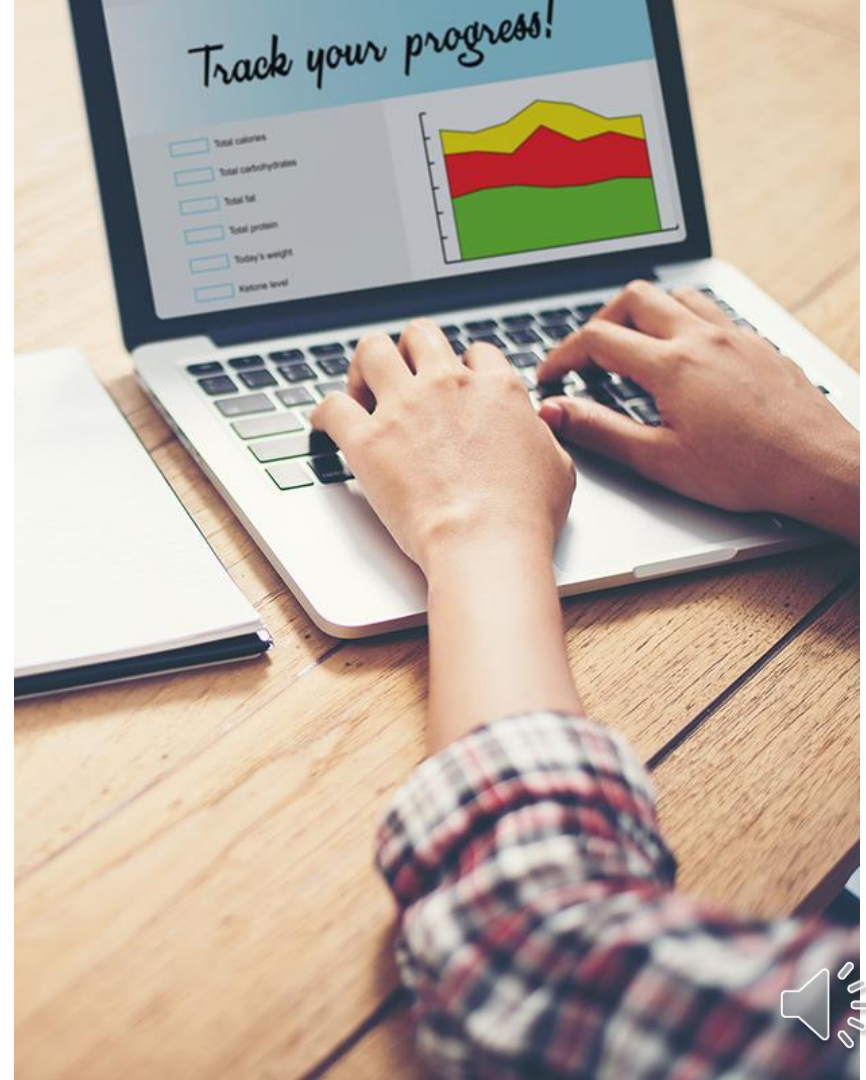


Secure Online Tools

Ankerl KetoCalculator

Cronometer

KetoDietCalculator
(licensed healthcare practitioners)



Carbohydrates

Carbs: 12-25 net grams

- Low: Best “first impression”
- Moderate: Health or hormone issues
- High: Low impact on glucose

Use glycemic index as a guide

- Cabbage: GI negligible = lg portion
- Berries: Higher GI = sm portion



Fats

- Use a combo of healthy fats and oils
- Balance omega-6: omega-3

Challenges:

- ✓ Overcome learned fear of fat
- ✓ Reinterpret “cholesterol”



Meal Planning: As Simple as 1-2-3!

- 1. Pick a protein**
- 2. Choose a carb**
- 3. Include healthy fat**



Insider Tips



Image credit:
Wavelength Media LTD / 123RF

The Bulletproof Model



Add
2-3 tbsp
of fats or
oils to a
hot drink

Lane JD. Caffeine increases ambulatory glucose and postprandial responses in coffee drinkers with Type 2 Diabetes. Diabetes Care. 2008 Feb;31(2):221-222.

Keep the Meat

- Uptick in media maligning animal protein
- Conclusions based on poorly controlled studies
- Red meat is the best food source of carnitine
- Keto followers who avoid animal protein may not be consuming the RDA for essential amino acids



Nutritional & Herbal Supplements

No consensus on best practice

- Multivitamin / Mineral?
- Vitamin D and K2!
- CoQ10? Fish oil?
- Pancreatic enzymes?
- Antioxidants? Flavonoids?
- Herbs and botanicals?



Contraindications; side effects; interactions; *purity & potency*

Ketone Supplements

MCT oil

- MCT oil or powders don't require bile or pancreatic enzymes for digestion
- Caprylic acid (C8)
- Too much may cause inadvertent weight loss

Ketone supplements

- Beta-hydroxybutyrate salts (β HB)
- Proprietary blends of MCT and β HB salts
- Esters- coming soon!

Keto for Cancer:

- Keeps glucose and insulin low and steady
- Improves metabolic health
- Improves quality of life
- Is palatable and satisfying
- Responds to changing needs
- Is sustainable long-term

Meal Timing and Frequency



- Keep to a narrow eating window (6 to 10 hrs)
- No food after dinner
- Limit snacks

Nutrient sensing impacts glucose, insulin, ketones, autophagy

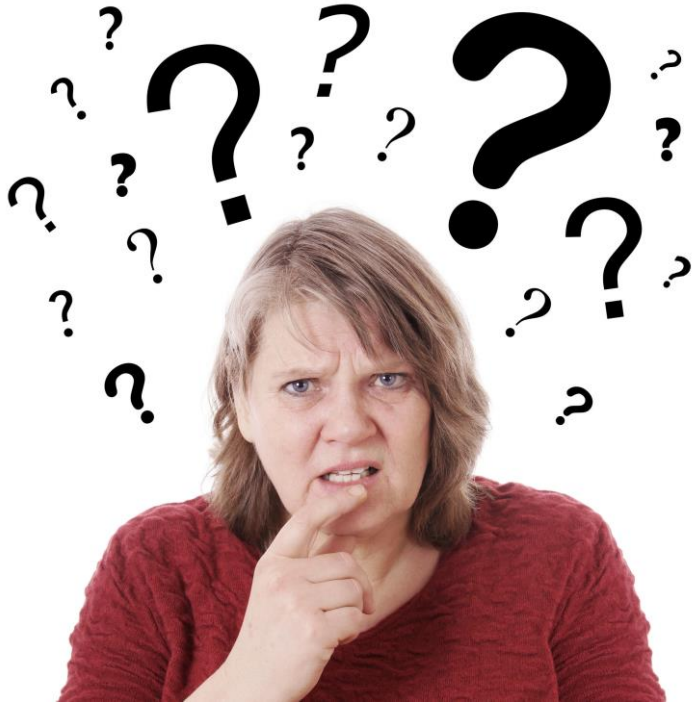
Look Ahead to the Rewards

- Improved metabolic health
- Less inflammation
- Consistent energy
- Improved cognition
- Improved quality of life
- Ideal weight (if weight loss is a goal)



➤ **A better understanding of the role of nutrition in health and disease**

Anticipate the Challenges



- Dehydration; headaches
- Constipation; diarrhea
- Brain fog; light-headed
- Electrolyte imbalances
- Heart palpitations
- Muscle cramps
- Fatigue
- Metabolic acidosis
- Rash

Manage the Transition



**Address side effects
before initiating the
diet**

Manage the Transition



- Plan for success
- Emphasize hydration
- Replace electrolytes with salted broth
- Consider small dose of exogenous ketones

Fasts

- Water-only fasts jump-start ketosis
- Short-term fasting during chemo reduces GI side effects¹



Image credit: maglara /123RF

1. Safdie FM, Dorff T, Quinn D, et al. Fasting and cancer treatment in humans: A case series report. *Aging (Albany NY)*. 2009;1(12):988-1007.

Dive In

To ease the transition:

- Pre-plan a full week's meals (or use template)
- Purchase foods and test recipes
- Keep a food diary or use an online tracker
- Measure glucose and ketones



Ease In...

- Provides for a more gradual adjustment
- Phases out sugars, grains, and starches while adding in healthy fats
- Allows time to gather resources



The First Few Weeks

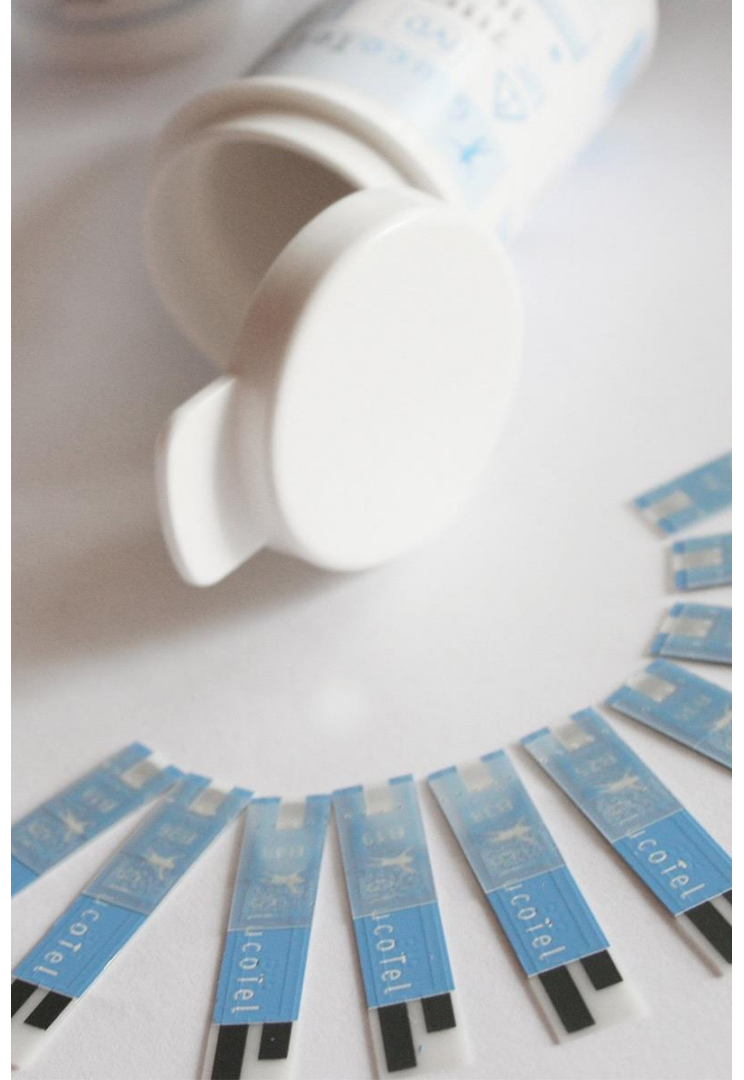
- Strategies to enhance compliance and accountability
- Kitchen tools including gram scale
- Meal planning and tracking tools
- Food lists and meal plan/template
- Cookbooks and online recipes
- Glucose/ketone monitoring



Measure Success

- Glucose:
 - ✓ blood meters
- Ketones:
 - ✓ urine test strips
 - ✓ blood meters
 - ✓ breath analyzers
- Keep records

Image credit: bodytel. Flickr CC BY-ND 2.0

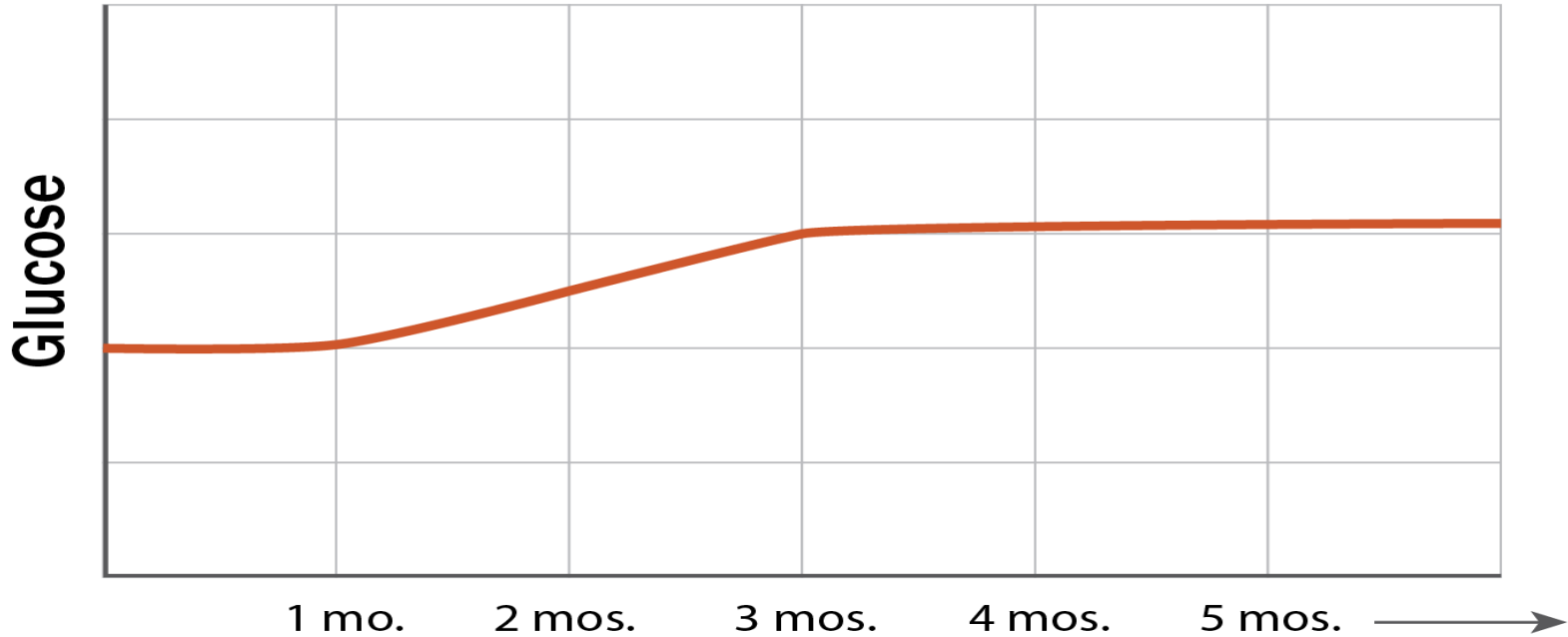


Look for Clues

- Food diary
- Lab reports
- Scan reports
- Activities
- Stressors
- Sleep quality



Adaptive Glucose Sparing*



* a.k.a. physiological insulin resistance



**Still
Listening?**

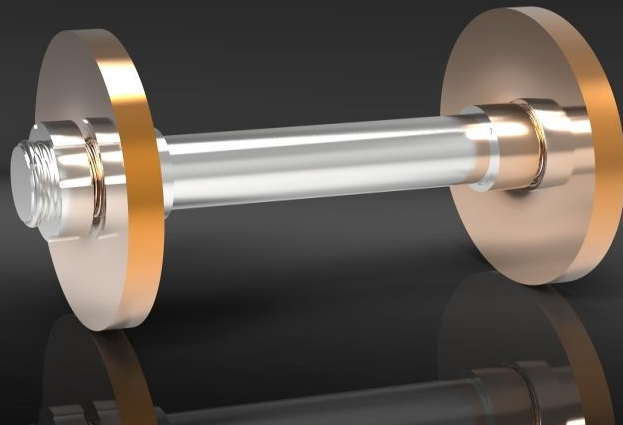
Fitness Counts!

Improves whole-body metabolism

Helps retain muscle mass

Improves balance, strength, flexibility

Relieves stress



Thrive With Support



Family



Friends

Ready! Set! Go!

1. Commit
2. Keep it simple
3. Get into ketosis
4. Track progress
5. Allow time to adapt

