



**Nutrition
Updates**

Today's Expert Presenters



Rachel Scherr, PhD
Assistant Research Scientist,
UC Davis Department of Nutrition



Sheri Zidenberg-Cherr, PhD
UC Cooperative Extension Nutrition Science Specialist
Vice-Chair, UC Davis Department of Nutrition

Today's Topics

- Nutrition Science vs. Popular Press
- Evaluating the Research: peer-reviewed publications, controlled studies; relationship of dose to outcome
- 'Superfoods'
- Specialty Coffee Drinks
- Other 'Healthy' Drinks
- Cleanses and 'Detox' Diets



Poll

Which of these topics have your class participants brought up or asked questions about? Mark all that apply.

- Alkaline water
- Apple cider vinegar drinks
- Cleanses and/or Detox diets
- Coconut water
- Kombucha
- None of these

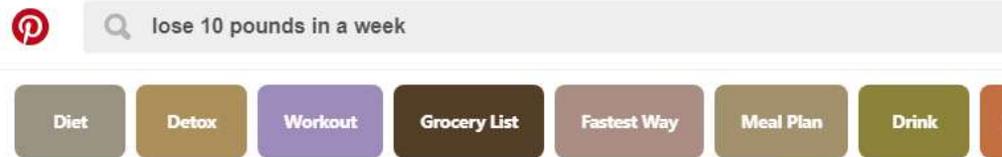


Federal Nutrition Guidance

- Dietary Guidelines for Americans – *USDA and HHS*
- Food Labels - *Food and Drug Administration*
- Disease Specific Recommendations - *Health and Human Services*
- Dietary Reference Intakes - *National Academies*



But where actually get their info?



Free Stock Photo courtesy of picxclix.com

Why All the Confusion and Conflict?

- The science of nutrition is constantly evolving.
- Old beliefs are discarded and advice changes as nutrition scientists conduct more research and gain greater understanding.

Beyond the Hype

- Nutrition is an inter-disciplinary science
 - **“Evidence-based”** recommendations
- Understanding these recommendations can help you identify the hype from those with good scientific evidence



“Don’t automatically switch to coconut oil. How to handle ever-changing nutrition science.”

Washington Post, April 24, 2018



Official guidelines provide nutrition and health information, but the public is overwhelmed with sensational headlines.

Nutrition is personal, people hear a message and internalize and react.

Consumers may switch to coconut oil based on one study, when the olive oil they formerly used is actually much healthier.

Not everyone can be an expert on nutrition; we must rely on those with nutrition science expertise.

Think critically about where the nutrition information comes from before making changes

Evaluating the Research and Claims: Dose Matters

- With respect to supplements or other food additives, dose matters
- If there have been scientific studies evaluating the action of an item, it usually is at a very specific dose
- Many food and supplement companies will put very little of the active ingredient in a product - and DOSE MATTERS
- While there may be scientific evidence that a certain compound has an effect, it is only at the specific dose studied



'Super' Foods

- Many so-called 'superfoods' are good for your overall health when incorporated into a healthy diet
- Unrealistic expectations - thinking a few 'super' foods can make up for poor diet and protect from chronic disease
- Same concept holds true about adding any of the 'healthy' drinks to the diet



Specialty Coffee Drinks

NOW SERVING: COUNTER CULTURE ESPRESSO

♀ BULLETPROOF COFFEE \$1 EXTRA

nuova
SIMONIELLI

Poll

Which of these is a current popular addition to coffee drinks? Mark all that apply.

- blue-green algae
- butter
- coconut oil
- mushroom
- turmeric
- none of these



Blue Algae Lattes

- Lattes that use blue-green algae powder in order to: 'aid the immune, endocrine, nervous, gastrointestinal, and cardiovascular systems.'
- Research has been conducted with Blue-Green Algae (Spirulina) to indicate that it could be useful in:
 - lowering lipids
 - acting as an antioxidant or anti-inflammatory



Blue Algae Lattes

- Most research has been conducted in cells and rodents, however there have been few human studies
- Blue algae is high in protein, vitamins, minerals and antioxidants
 - But like any supplement, the content is not regulated and can contain other fillers and contaminants



Edible BGA



Carotenoids

GLA

PC

Fibers

Plant sterols

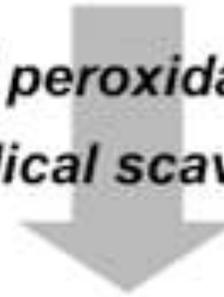
↓ *NF-κB* activity



↓ *Cholesterol absorption*



↓ *Lipid peroxidation*



↓ *Hepatic lipid*

↑ *Free radical scavenging*

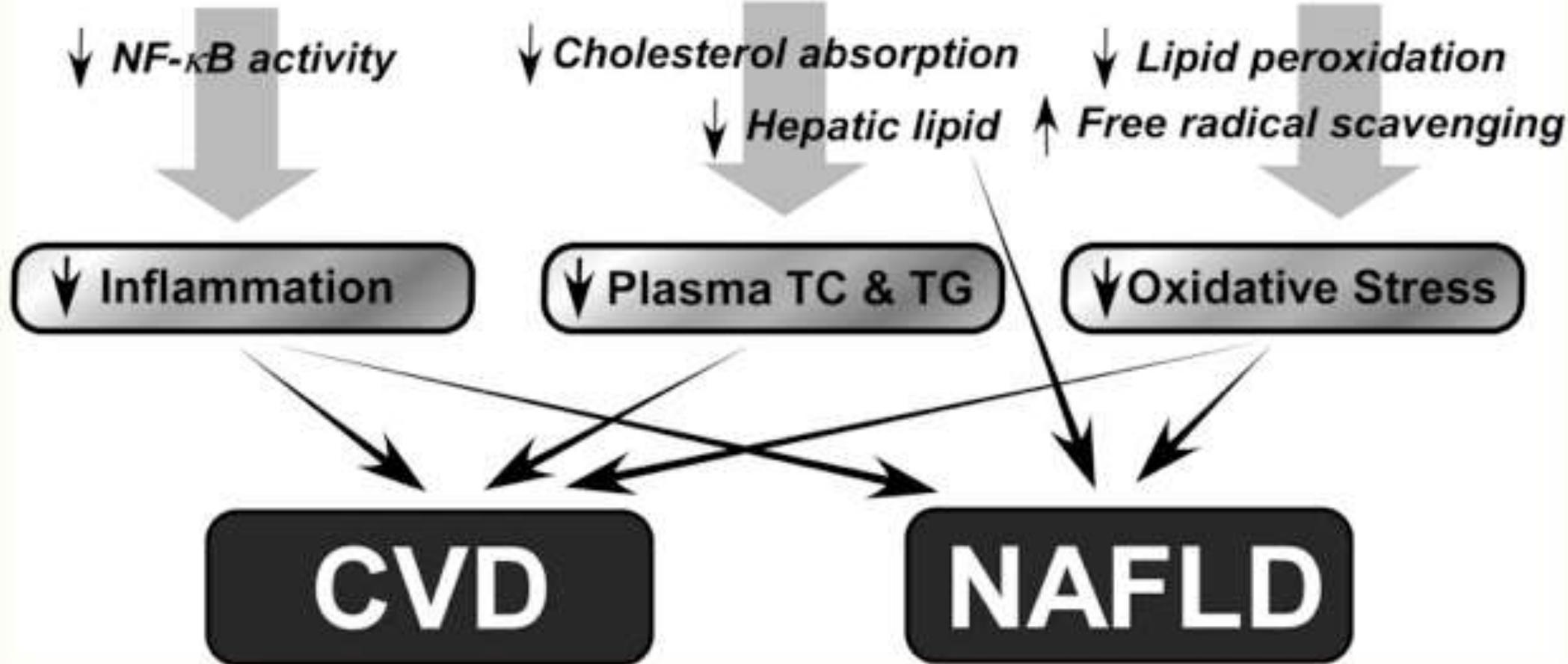
↓ Inflammation

↓ Plasma TC & TG

↓ Oxidative Stress

CVD

NAFLD



Dose of Blue Algae in Lattes

- Human clinical trials have used 1-8 g per day of blue algae to show some positive health effects (small studies)
- Nutrient dense: contain protein, iron, and Omega-3s
- Amount in a 'scoop' unknown - blue algae powders contain a proprietary blend of algae extracts and other fillers
- Concern with contamination is high



Golden Lattes (Turmeric)



- Lattes made with golden milk that contains powdered turmeric or fresh turmeric milk
- Turmeric contains the bioactive compound curcumin which in cells and animal models have been shown to have an anti-cancer effect
- Curcumin has limited bioavailability as it's poorly absorbed and rapidly metabolized

Golden Lattes (Turmeric)



- Golden milk contains $\frac{1}{2}$ teaspoon of turmeric per 1 cup milk
 - 50 times this dose (2-3 grams of pure curcumin) shown to have anti-cancer effect
- Typical Indian diet contains ~200-1000mg day



Mushroom Coffee

- Adding a mushroom extract to coffee “claims” to aid in digestion and even be anti-cancer
- One human study indicated that 8g and 16g produced a positive response on after-meal triglyceride levels in healthy adult men



Mushroom Coffee

- Mushrooms are fungi and contain fiber, minerals, ergosterol (converted to Vitamin D2 with sunlight), conjugated linoleic acid, and ergothioneine
- The Mushroom Council (2013) indicated there could be health benefits to consuming mushrooms, but more research was needed



Mushroom Coffee

- FourSigmatic makes the mushroom coffee blends
- They contain a variety of different mushrooms, including Chaga mushrooms (which they claim are alkaline)
- The amount of mushrooms in the coffee blends is not available
- One concern about consuming freeze-dried and concentrated mushrooms is the presence of mycotoxins
- The main concerning mycotoxin is aflatoxin, which has been associated with liver cancer



Bulletproof Coffee



- Bulletproof coffee claims to be a healthy meal replacement
- Contains coffee + 2 tablespoons of butter + 1-2 tablespoons of MCT oil like coconut oil
- Contains 441 Calories and 51 grams of fat (80% of fat is saturated)
- Things it does NOT contain: protein, vitamins, minerals, fiber
- The emergence of bulletproof coffee coincides with the gaining popularity of the ketogenic diet

What is the Ketogenic (Keto) Diet?

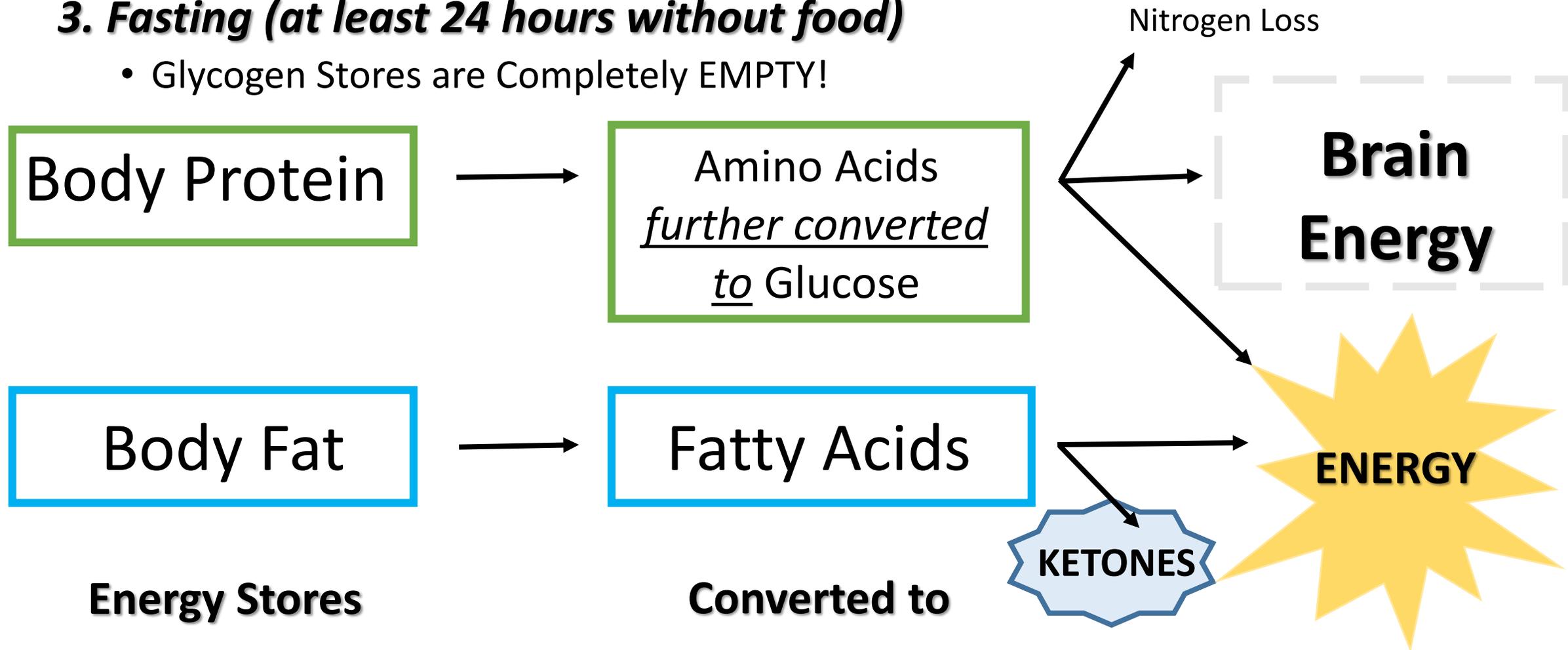
- Diet with a strict eating pattern that is high in fat, moderate in protein, and low in carbohydrates.
- Compare: National Academies of Sciences, Engineering, and Medicine (Institute of Medicine) recommends:



What are the Major Pathways Involved in Metabolism?

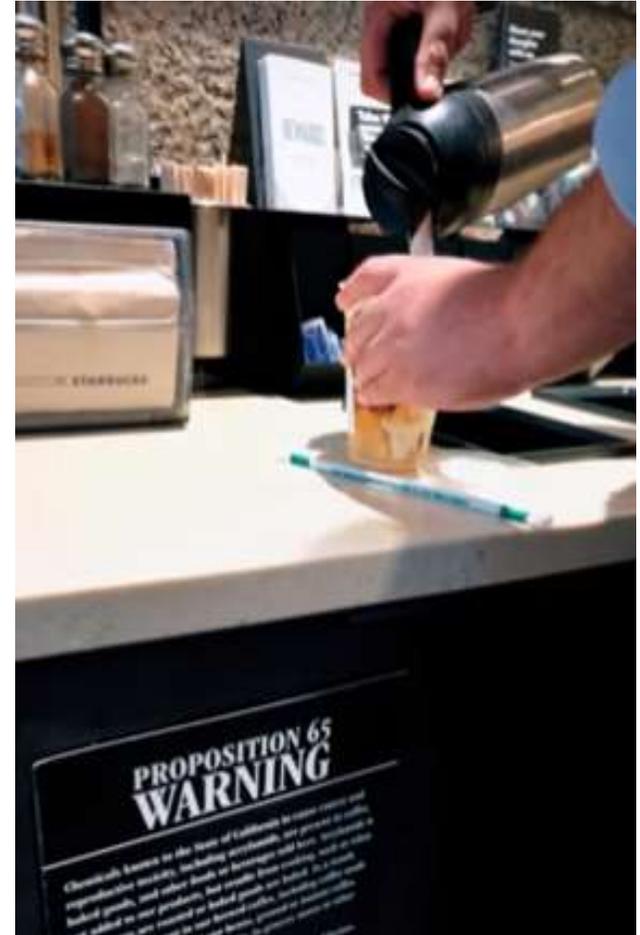
3. Fasting (at least 24 hours without food)

- Glycogen Stores are Completely EMPTY!



Coffee and Prop 65 in California

- Proposition 65 - Safe Drinking Water and Toxic Enforcement Act
- March 2018 - California judge ruled that coffee products and producers must label with Prop 65
- Coffee ends up with trace amounts of acrylamides during the roasting process
- Acrylamides are known carcinogens - however the dose found in light and dark roasted coffee is so trace, it's not considered harmful
- The WHO removed coffee from its list of carcinogens



Dietary Supplements Containing Extremely Concentrated or Pure Caffeine

- **What's the issue?**

- Highly concentrated liquid and pure caffeine products (sold in both liquid or powdered forms):
 - High risk that they will be mistakenly consumed in excessive and potentially dangerous doses
 - Sold in bulk packages
 - Linked to at least two deaths in otherwise healthy individuals



Dietary Supplements Containing Extremely Concentrated or Pure Caffeine

- **Why is it important for the FDA to take protective steps for the consumer?**
 - 1/2 cup of highly concentrated liquid caffeine = about 2,000 mg of caffeine
 - A teaspoon of powdered pure caffeine = about 3,200 mg of caffeine
 - Both are equivalent to about 20 – 28 cups of coffee



Dietary Supplements Containing Extremely Concentrated or Pure Caffeine

- **Why is it important for the FDA to take protective steps for the consumer?**
 - Risk of overdose and misuse is high when highly concentrated caffeine products are:
 - Sold in bulk quantities
 - The consumers are expected to measure a very small, precise recommended serving



Dietary Supplements Containing Extremely Concentrated or Pure Caffeine

- **What is the FDA is doing to address this issue?**
 - Issued new guidelines
 - Dietary supplements containing pure or highly concentrated caffeine in powder or liquid products are considered UNLAWFUL when sold in bulk quantities directly to the consumer
 - This guidance is immediately in effect
 - The FDA is prepared to take the next steps to begin removing illegal products from the market

<https://www.fda.gov/Food/DietarySupplements/ProductsIngredients/ucm604315.htm>

Other 'Healthy' Drinks



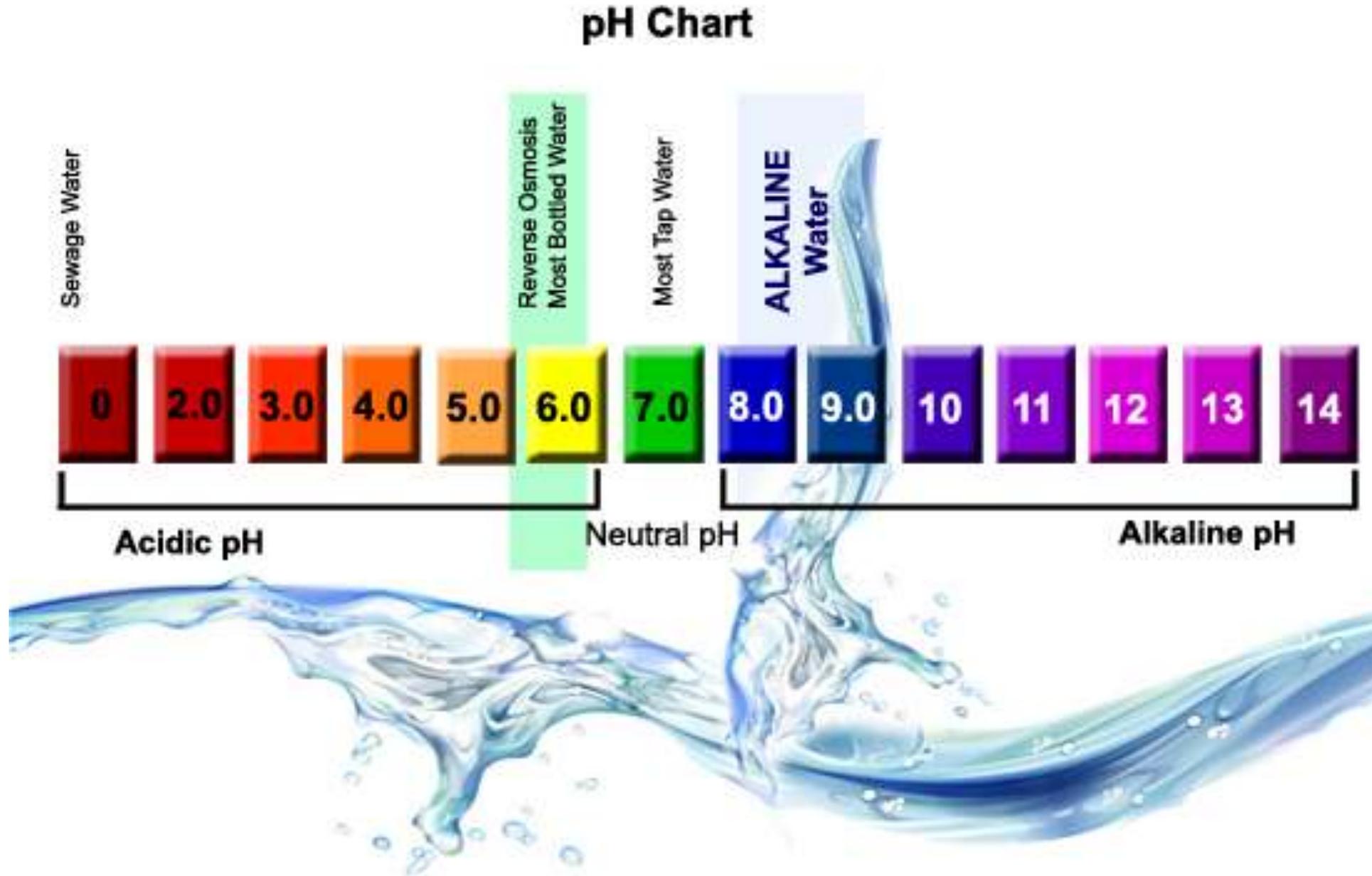
Poll

Which of these drinks have you tried? Mark all that apply.

- alkaline water
- apple cider vinegar drinks
- coconut water
- cold-pressed juice
- Kombucha
- none of these



Alkaline Water



Alkaline Water Claims

- Neutralizes acid in your blood stream
- Boosts your metabolism
- Helps your body absorb nutrients more effectively
- Helps prevent disease
- Slows the aging process
- **No scientific evidence**
Plain water is best



7 BENEFITS of Alkaline Water

1. **Weight Loss**
control digestion
2. **Body Detox**
removes heavy metals
3. **Hydration**
better water absorption
4. **Healthy Skin**
younger look
5. **Good Digestion**
hydrated intake tract
6. **Muscles & Joints**
stronger binder
7. **Energy**
power of Hydrogen

Apple Cider Vinegar/ACV Detox

- Apple cider vinegar is an amber-colored vinegar made from cider or apple 'must'
- ACV Detox involves:
 - Consuming the vinegar up to 3 times a day, or
 - Consume raw, unfiltered ACV that still contains the "mother" - which is touted to contain enzymes, minerals, and probiotics



Apple Cider Vinegar/ACV Detox



- ACV Detox drinks contains:
 - 1-2 Tablespoons ACV + 8 ounces water
 - optional to add 1-2 tablespoons of a sweetener
- Can also incorporate through diet
 - salad dressings, marinades,
 - sprinkling over popcorn,
 - stirring into soups, stews, etc.

Health Claims about ACV Detox

- helping with weight loss, reducing appetite
- balancing the body's pH
- regulating blood sugar levels
- lowering cholesterol
- improving digestion
- boosting the immune system
- providing probiotics (good bacteria) to the gut
- aiding in the removal of toxins
- healing skin conditions
- providing enzymes to the body

13 Health Benefits of Apple Cider Vinegar



Relieves Constipation
ACV acts as a natural laxative. It stimulates digestive juices that help the body break down food. ACV also contains pectin, which is a water-soluble fiber that helps to normalize acid levels and increase the absorption of fiber. A diet rich in fiber helps stimulate regular bowel movements.

Fights Acid Reflux
Contrary to popular belief, acid reflux typically results from having too little acid in your stomach (not too much). To improve the acid content of your stomach, drink ACV before meals. Just add a tablespoon of raw, unfiltered ACV to a large glass of water and drink!

Promotes Good Gut Bacteria
ACV contains probiotics and a type of acid that promotes the growth of probiotic. Probiotics are "good" gut bacteria that help keep you healthy.

Cures Candida (Yeast)
To treat Candida overgrowth, you must first stop the yeast from spreading. One of the most effective ways to do that is to rebalancing your gut bacteria.

Detoxes The Body
ACV has antibacterial and antimicrobial properties. Consuming ACV helps flush harmful toxins from the body.

Regulates pH
Balancing your bodies pH can reduce risk of chronic disease & boost energy.

Lowers Blood Pressure
Studies show ACV lowers blood pressure and promotes heart health.

Balances Blood Sugar
The acetic acid found in ACV can help balance blood sugar levels and improve diabetes.

Fights Cancer
ACV is rich in antioxidants that help fight cancer.

Fights Allergies
Along with boosting your immune system, ACV helps break up mucus and supports lymphatic drainage.

Aids Weight Loss
Studies show ACV to promote fat loss and reduce sugar cravings.

Clears Sinuses
ACV helps break up mucus and clears sinus cavities.

Fights Colds
ACV is loaded with immune-boosting vitamins and antioxidants that help keep you healthy.

GUT HEALTH PROJECT

Adverse Effects of ACV

- Potential to erode tooth enamel
- Can interact with medications and supplements including diuretics and insulin
- Can irritate throat and stomach
- No evidence that frequent use of ACV is completely safe



Studies about ACV

- Almost no human studies evaluating the efficacy of ACV claims
 - One 2004 study with 10 diabetic individuals did show promise with respect to blood sugar response to starch (however note the small sample size and population)
 - Another human study was conducted in 2009 in obese Japanese adults and showed weight loss over 12 weeks
- These are the only human studies, all other studies are in animals
- Bottom line - most claims cannot be extrapolated to healthy individuals, the studies haven't been replicated, and most claims are based on animal studies.



Kombucha

- Kombucha is a type of fermented tea
- It is touted as a cure-all, however there is little scientific evidence to support these claims
- Many of the claims are related to the fact that kombucha is a probiotic and contains live cultures

SCOBY -
symbiotic
culture of
bacteria
and yeast



By Mgarten at the English Wikipedia, CC BY-SA 3.0

Kombucha

- Because kombucha is created by bacterial fermentation, a few issues can arise
- Can be contaminated with harmful bacteria – if brewed correctly, good bacteria should out-compete bad bacteria for nutrients
 - Home brewers may not quite realize when the fermentation is not quite right, resulting in contaminated kombucha (frequently with *Aspergillus*)
- Can be alcoholic - the older the kombucha → the more sugar there is to ferment → the more alcohol
 - In 2010, Whole Foods had to recall kombucha for containing too much alcohol (must contain less than 0.5%)

Cold-Pressed Juice

- Juice made without any heat during the process
- May maintain vitamin content slightly better than juicing processes - not scientifically proven
- Many are not pasteurized and begin to spoil in 3-4 days
- Some are pasteurized using high-pressure pasteurization (HPP) - shelf-life of 30-45 days



Coconut Water - Claims

“Dissolves kidney stones”

“Prevents atherosclerosis”

“Enhances immune system”

“Prevents glaucoma and cataracts”

“Balances blood sugar”

“Prevents cancer”

“Revives hair growth”

Coconut Water Benefits

www.vivienwell.com

1. **Natural Diuretic** - unlike pharmaceutical drugs, coconut water does not affect electrolyte balance and hormones to force water removal.
2. **Aids in Kidney Function and Dissolves Kidney Stones** - releases a therapeutic effect on the urinary and reproductive systems.
3. **Improves Blood Cholesterol Levels and Prevents Atherosclerosis** - both young and mature coconut water are beneficial in preventing atherosclerosis and reducing risk of heart disease.
4. **Enhances Immune System** - thanks to monolaurin and arginine.
5. **Prevents Glaucoma and Cataracts** - effective in reducing fluid pressure in the eyes and fights the symptoms of cataracts.
6. **Relieves Constipation** - drinking a minimum of 11 ounces a day softens stools and increases the urge to go number two.
7. **Balances Blood Sugar** - contains arginine, an amino acid that helps moderate sugar absorption. Arginine also improves insulin sensitivity - so blood sugar is more readily transported from the bloodstream into the cells.
8. **Boosts Energy Levels** - without the jitters! Its colony of living cells makes it a healing liquid with living energy. Drinking coconut water is like getting a blood transfusion!
9. **Cytokinins Powerhouse** - cytokinins are the plant version of cytokines for humans. Cytokinins are involved in reproduction, growth and development, homeostatic regulation, healing and repair, blood clotting, and immunity. This hormone-like-substance contains anti-ageing, anti-cancer and anti-thrombolytic benefits in humans.
10. **Prevents Cancer** - when the growth hormone, cytokinins, are added to cancerous tissue, abnormal growth is retarded. Studies show cytokinins also induces apoptosis or programmed cell death in cancer cells. Cytokinins are proven to have anti-cancer effects.
11. **Hair Growth** - coconut water has the potential to revive hair growth. Dr Verallo-Rowell theorises that cytokinins may be able to stop hair loss and even restore hair to a balding head. Drinking and applying coconut water into the scalp daily over an extended period is needed.
12. **Feeds Friendly Gut Bacteria** - coconut water kefir cleanses the body and helps rid the body of yeast overgrowth. It stops sugar cravings, prevents eczema flare-ups, balances hormones, and gets rid of heavy metals in the body.
13. **Excellent Rehydration Sports Drink** - a rich source of electrolytes and natural salts, especially potassium and magnesium. It is a living food with easily absorbable electrolytes, sugars, antioxidants, enzymes, amino acids, vitamins and other nutrients.
14. **Provides a Chock-full of Trace Elements** - loaded with zinc, selenium, iodine, sulfur, and manganese.

Source: "Coconut Water for Health and Healing" by Dr Bruce Fife

Coconut Water

- Evidence in the literature
 - *Norton et al, Int J Exerc Sci: Conference Proceedings, 2013*
 - Both coconut water and low calorie sports drink effective at rehydrating exercise participants
 - *Saat et al, J Physiol Anthropol, 2002*
 - Coconut water, carbohydrate-electrolyte beverage, and pure water effective at rehydration during a 2 hour rehydration period following exercise-induced dehydration
 - Results indicate coconut water caused less nausea, fullness, and no stomach upset, as compared to carb-electrolyte beverage and pure water upon rehydration period
 - *Campbell-Falck et al, Am J Emerg Med, 2000*
 - Case study: Solomon Island patient was administered coconut water intravenously for rehydration

A glass of vibrant green juice is the central focus, surrounded by fresh ingredients: stalks of celery, a head of green cabbage, and a bunch of leafy green herbs. A whole green apple is also visible among the produce. The background is dark, making the green colors stand out.

Cleanses and Detox Diets

Poll

Which of these regimens have you heard about?

Mark all that apply.

- detox tea
- charcoal detox
- clay detox
- Master Cleanse
- none of these



What is a 'cleanser' and 'detox'?

- **Detox** = is a treatment to help patients cut out an intoxicating or addictive substance.
 - In a hospital or medical setting, prescription medications are used to remove life-threatening levels of drugs
- **Cleanse** = programs generally targeted as a way to flush yourself of hidden “toxins.”



Master Cleanse



Start the Year Off Right With
the Master Cleanse!



The Master Cleanse

365 Sea Salt

365 Sea Salt

Organic Smooth Move

Organic Smooth Move

Organic Smooth Move

Organic Smooth Move

What is the Master Cleanse?

- The Master Cleanse is a liquid diet that claims to help your body drop 20 pounds in 10 days and cleanse your body from harmful toxins
- The Diet originates from Stanley Burroughs who published *The Master Cleanser* in 1976
 - Book includes his philosophy of disease and home remedies for various illnesses such as ring worm, dandruff, and athlete's foot



What is the Master Cleanse?

- Follows a strict 3 to 10 day diet of 650 Calories Per Day
- Regimen
- **Ease-In Phase:**
 - Day 1: “living foods,” such as vegetables and whole grains
 - Day 2: soup broths and fruit and vegetable juices
 - Day 3: orange juice



What is the Master Cleanse?

Regimen:

- **Lemonade Diet Phase** (main component):
 - Drink a special “lemonade” 6 to 12 times per day or whenever you are hungry
 - Includes organic fresh squeezed lemon juice, organic grade B maple syrup, ground cayenne pepper, and water
 - Drink a nightly herbal laxative or a morning saltwater flush
- **Ease-Out Phase:** Ease-In Phase in Reverse



Unsubstantiated and Specific Claims of the Master Cleanse

Purpose of the Lemonade Diet

- To dissolve and eliminate toxins and congestion that have formed in any part of the body.
- To cleanse the kidneys and the digestive system.
- To purify the glands and cells throughout the entire body.
- To eliminate all unusable waste and hardened material in the joints and muscles.
- To relieve pressure and irritation in the nerves, arteries, and blood vessels.
- To build a healthy blood stream.
- To keep youth and elasticity regardless of our years.

When to Use the Lemonade Diet

- When sickness has developed – for all acute and chronic conditions.
- When the digestive system needs a rest and a cleansing.
- When overweight has become a problem.
- When better assimilation and building of body tissue is needed.

Why is the Master Cleanse Becoming Popular?



Health Claims of the Master Cleanse

- Claim to remove “toxins” from our bodies
- Toxins – biologically produced poisons
 - uric acid, urea, lactic acid, and waste products from microbes in the gut
- ‘Toxin’ used incorrectly to describe anything that makes one ill
 - Ex: fecal matter builds up in the intestines leaving behind toxins
(this is not true)
- The human body has organs whose jobs are to detoxify
 - The **liver** alters the chemical structure of toxins
for removal by the **kidneys**



Other Common Detox Diets

1. Cold-Pressed Juicing

- One of the most popular detox diets
- Requires individuals to consume 8 bottles of cold-pressed juice per day.
- The juices act as a meal replacement across each day

2. Clay

- Diet plan where bentonite clay is consumed either through eating or drinking
- The clay acts as a binder for toxins (but may bind to essential nutrients like Calcium)



Other Common Detox Diets



3. Green Smoothie

- Diet plan that involves drinking 3 green smoothies each day along with high protein snacks, such as eggs and nuts, and vegetables

4. “Detox” Tea

- Detox Diet involves drinking specific labeled tea to improve health
- Many companies sell “detox” tea
- Premise behind it:
 - Helps to drop weight, improve immunity, and prevent cancers

Other Common Detox Diets *continued*

5. Charcoal Detox

- Detox Diet involves drinking activated charcoal
- Premise behind it:
 - Activated charcoal is considered an effective treatment for poisoning and drug overdose
 - When charcoal is consumed it binds to substances, which prevents them from entering the blood stream

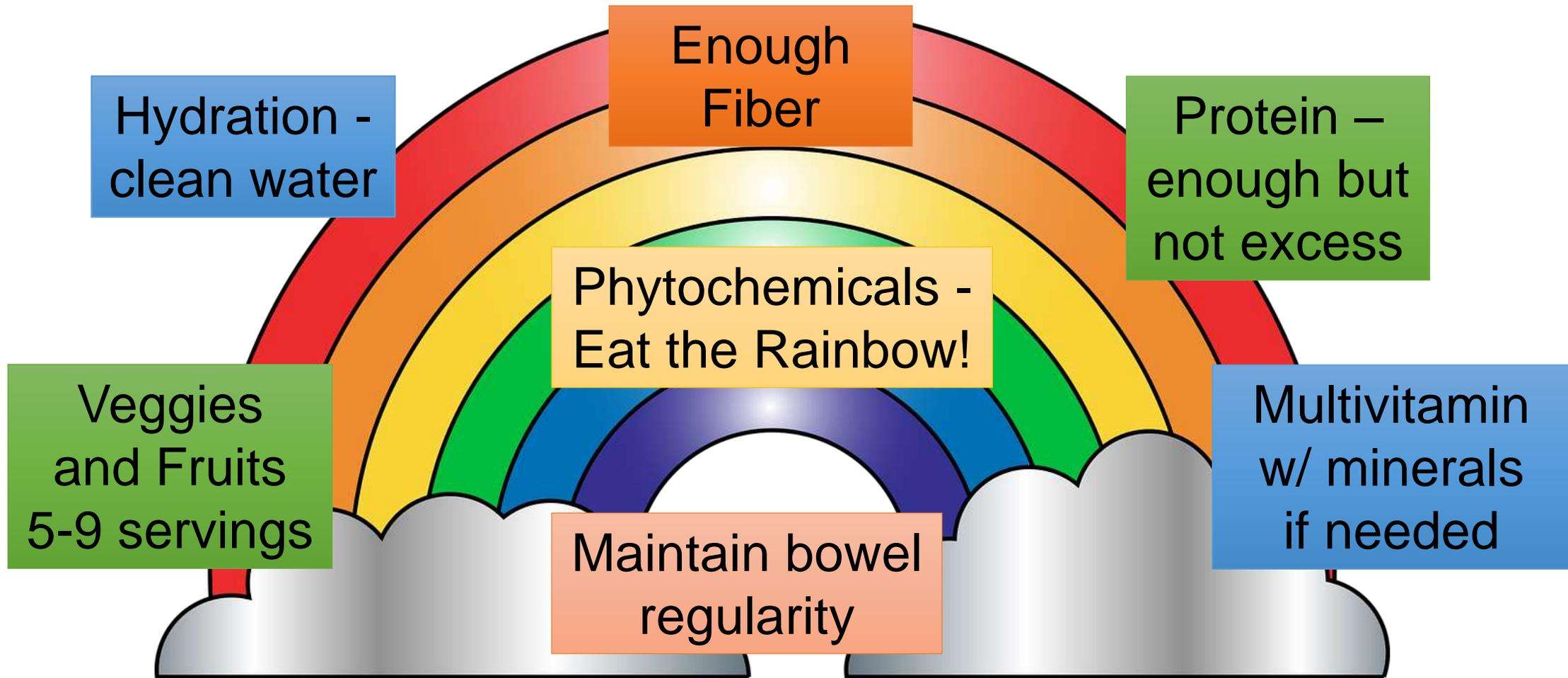


What can go wrong with detox diets?

- Using cleanse and detox diets may actually **suppress** our body's own detoxification capabilities
 - thereby *increasing* toxin load in the blood stream



How Can We Support Healthy Natural Detoxification?



Side Effects of Detox Diets and Cleanses

- Individuals who do the Master Cleanse generally suffer from:
 - Headaches
 - Dizziness
 - Diarrhea
 - Nausea

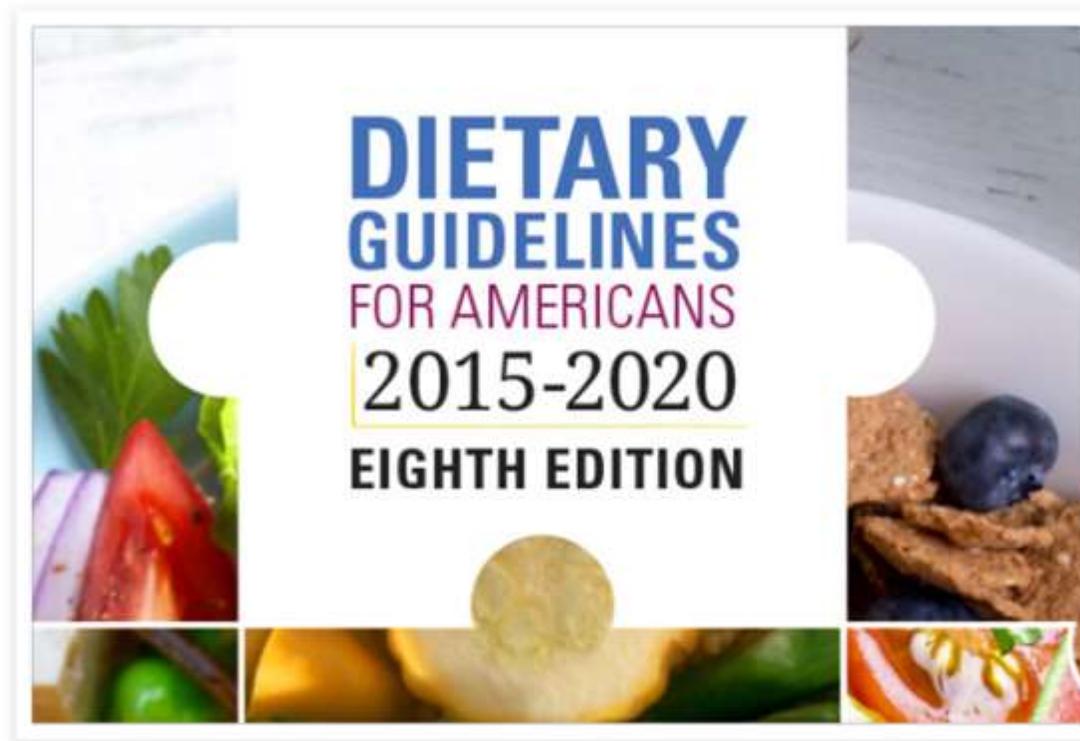


Additional Concerns

- The Master Cleanse Diet only includes 600 to 1,200 calories per day and is deficient in most essential nutrients
- Rapid weight loss associated with the Master Cleanse is not considered safe or sustainable
- Other types of detox diets are limiting also and may not meet essential nutrient needs
- These diets may have harmful side effects because of certain components:
 - Oxalates in green smoothies, binding from the clay or charcoal

What can we conclude?

- If you want maintain a healthy body weight it is recommended that you follow the Dietary Guidelines for Americans 2015-2020



Responding to Misinformation

I read online that I need to use something to
cleanse my body from toxins.

Affirm/Reflect

That subject is getting a lot of attention online.
It sounds like you are interested in improving your health.

Offer correct information

Let's talk about what the science says...

Thank/Move On

Thank you for your comments and for
the chance to provide the group more information.
Now let's discuss...

Nutrition Information

UCDAVIS

DEPARTMENT of NUTRITION

<http://nutrition.ucdavis.edu>



CENTER for NUTRITION in SCHOOLS

CONNECTING FOOD, HEALTH, AND LEARNING

<http://cns.ucdavis.edu>

Websites with Reliable Nutrition and Health Information

Academy of Nutrition and Dietetics <http://www.eatright.org>

National Institutes of Health <http://www.nih.gov>

American Council on Science and Health <http://www.acsh.org>

Food and Drug Administration <http://www.fda.gov>

Centers for Disease Control & Prevention <http://www.cdc.gov>

US Department of Agriculture <https://www.choosemyplate.gov/>





Next *Nutrition Updates Webinar*

September 4, 2018 11:00 AM – 12:30 PM

Thank You for Participating!

Please complete the survey
which will follow.

