

Fact or Fiction: Nutrition Myths in Oncology

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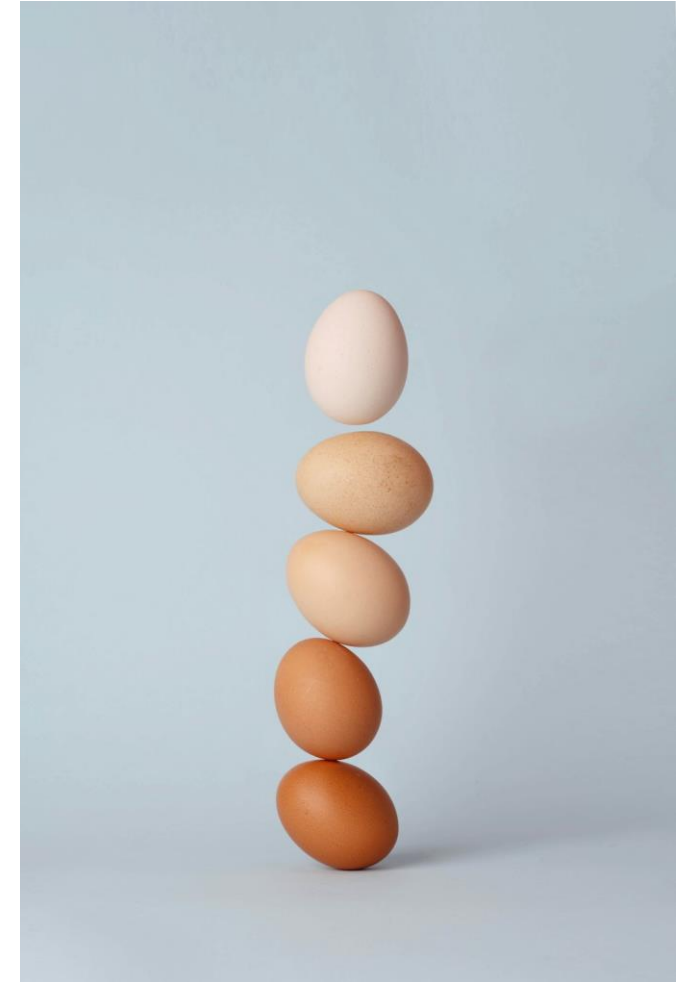


Agenda

- Brief overview cancer and nutrition
- Debunking nutritional myths
- Available resources

Oncology nutrition goals

- To support:
 - Nutritional status
 - Body composition
 - Functional status
 - Quality of life
- To prevent:
 - Cachexia
 - Malnutrition



Defining the problems

- Malnutrition- deficiency or imbalance of energy, protein and other nutrients causing adverse effects on tissue/body form
 - Affects up to 85% of patients with certain cancers
- Cancer cachexia – form of malnutrition characterized by loss of lean body mass, muscle wasting, impaired immune, physical and mental function
 - Poor response to therapy
 - Increased risk of treatment related adverse events
 - Poor outcomes
 - Cause of death in 30-50% of all cancer patients

Nutrition Care Process

Healthcare worker (nurse)



Nutrition screening



Nutrition assessment



Nutrition diagnosis



Nutrition Interventions



Monitoring and evaluating

Nutrition screening example

Admission Assessment Nurse Screening		
Item	Value	Last Update Date
Complaint(s) On Admission	constipation	04/18/2024 20:46
Reason For Admission	Cycle 1 epoch-r	04/18/2024 20:46
Current GI Symptoms	Constipation;	04/18/2024 19:55
Weight Change Intention	Unintentionally	04/18/2024 19:55
Dietary Restrictions Followed At Home	No special diet,	04/18/2024 19:55
Weight Change	Patient reports weight loss;	04/18/2024 19:55
Weight Change Amount	> 20 pounds (> 9.0 kg)	04/18/2024 19:55
Weight Change Time Frame	in four to six months	04/18/2024 19:55
FAST- Difficulty With Swallowing	No,	04/18/2024 19:55

Benefits of adequate nutrition during treatment

- Impact quality of life
- Enhance clinical response
- Reduce postoperative infection rates
- Better control of cancer-related symptoms
- Shorten hospital stay
- Improve tolerance to treatment

Nutrition myths

- Everyone eats → everyone has opinions about food
- Preliminary research → not conclusive
- Nutrition: an area for control among patients



Too many sources for confusion

- Sullivan et al 2020 findings:
 - 56% confused by conflicting nutrition information
 - 37% had tried unproven dietary strategies (restrictive diet, supplements, detox)
 - 32% avoided specific foods
 - 57% of those that did not see an RD wanted to see one during treatment
- Inadequate RD staffing outpatient oncology centers: ratio 1:2308



Ask the audience!

- Polling question 1: Have you heard anyone say that “sugar feeds cancer?”

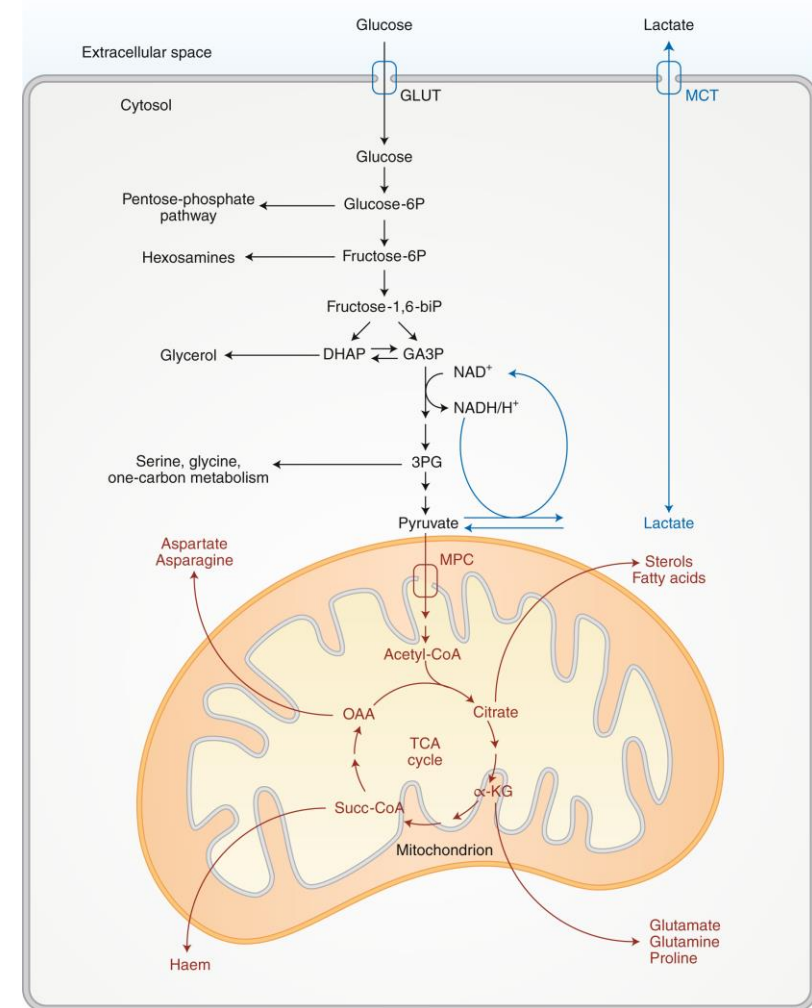
The most quoted

- “Sugar feeds cancer”
- “If I stop eating sugar, I’ll starve my cancer”
- 1/3 of cancer patients actively avoid sugar



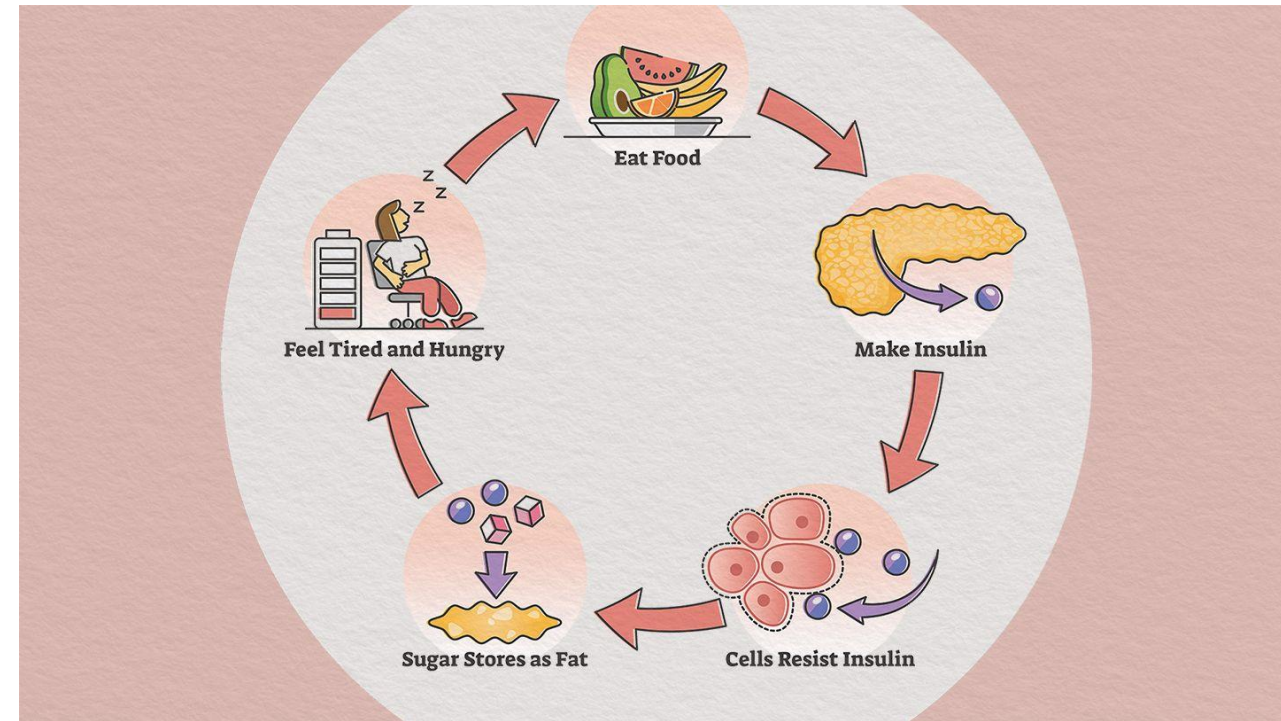
History of “sugar feeds cancer” myth

- 1920s: Otto Warburg observed higher rates of glycolysis in cancer cells – even with oxygen
- 1950s: Warburg observed cancer cells rely on glycolysis for energy rather than oxidative phosphorylation- “The Warburg Effect”
 - Favors tumor growth



Debunking the myth

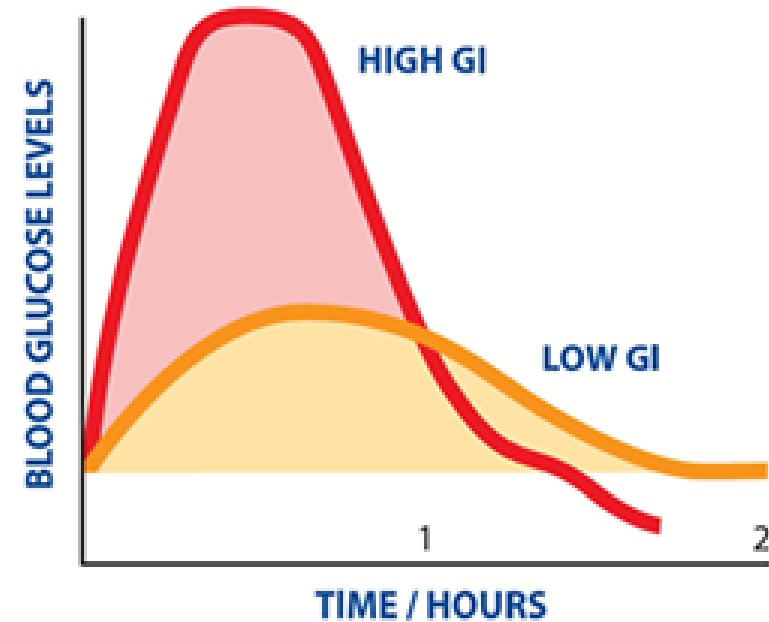
- Our bodies rely on glucose
- Liver stores glucose
 - Gluconeogenesis → make glucose from muscle and fat
- Chronic excess intake sugar → excess insulin → insulin resistance → cancer growth
- Low glycemic foods – favored to high glycemic foods



<https://www.everydayhealth.com/type-2-diabetes/insulin-resistance-causes-symptoms-diagnosis-consequences/>

Low Glycemic Foods

- Takes longer to digest/break down
- Slows rate of glucose in bloodstream
- Beneficial nutrients such as vitamins, fiber, phytochemicals



The amount of carbohydrate in the reference and test food must be the same.

<https://r>

Which is more harmful: sugar or this myth?

- Cancer patients already nutritionally at risk
- Cutting out sugar or whole food group → risk for weight loss
- Missing beneficial nutrients
- Causes significant stress
- Reduces pleasure from food



Is all sugar created equal?

- Fructose = fruit = fiber
- Artificial sweeteners – limit
- Natural sweeteners-sugar is sugar!
 - Honey
 - Agave
 - Maple syrup
- AHA- limit to 6 tsp added sugar daily



Fact: Eat sweets in moderation

- Consume mostly complex carbs (low glycemic foods)
- Space out carbohydrates
- Pair carbs with protein or fat
- Limit artificial sweeteners
- Move your body!



Carbohydrates: MedlinePlus

Myth: “Only eat when you’re hungry”

- Higher energy needs due to inflammation and changes to
 - Protein metabolism
 - Carbohydrate metabolism
 - Lipid metabolism
 - Tumor necrosis factor
 - IL 1, IL 6, Interferon Gamma
- High risk of weight loss, risk for cachexia and malnutrition



Why is this so detrimental?

- Nutrition problems at baseline from treatment
 - Taste changes (ageusia, dysgeusia)
 - Food aversions
 - Nausea, vomiting
 - Diarrhea
 - Mucositis
 - Dysphagia
 - **Anorexia-40-80%**



Fact: Eat what your body tolerates

- Small frequent meals
- Eat around the clock
- Focus on fat and protein – maximizing calories!
- Consume beverages with calories- juice, milk, protein shakes
- Separate meals from drinks
- Medication-management of symptoms
- Appetite stimulant?



Myth: High Dose Supplements Cure Cancer

- 23% of people with cancer take herbal or botanical supplements
- In 2011, US Poison Control Centers received 29,000 calls regarding adverse effect from dietary supplements
- Interactions: alterations in absorption, bioavailability, drug clearance



What's the harm?

- Can decrease drug effectiveness
 - St. John's wort- imatinib and irinotecan
 - Goldenseal
 - Echinacea
 - Allium (garlic) oil
- Can interact
 - Antioxidants
- No reported risk – not yet studied!
 - Aloe vera
 - Kelp
 - Chia seeds
 - Ginger
 - Cinnamon
 - Elderberry
- About Herbs – good resource

Fact: Incorporate herbs/spices in meals

- Eat dietary sources
 - Add ginger, turmeric, cinnamon to foods
 - Eat variety of fruits and vegetables
 - Drink herbal teas



Myth: “Probiotics are safe during treatment”

- Benefits

- Suppression of pathogenic bacteria
- Immunomodulation
- Stabilize epithelial barrier
- Anti-inflammatory response
- Decrease luminal pH
- Can alleviate treatment-related side effects

- Risks

- Infections (bacteremia)
- GI side effects
- Skin reaction
- Antibiotic resistance genes
- Abnormal stimulation to immune system

Benefits and Risks

Prevent or treat cancer

Gastrointestinal tumor

- Colorectal cancer

Non-gastrointestinal tumor

- Liver cancer
- Pancreatic cancer
- Breast cancer
- Lung cancer

Improve side effects of anti-tumor treatment

Intestinal mucosal damage

- Diarrhea

Oral mucosal damage

- Mucositis

Systemic inflammation

- Graft-versus-host disease

Other inflammation reaction

Adverse effect of probiotics

Gastrointestinal reaction

- Diarrhea
- Bloating

Infection

- Bacteremia
- Fungemia
- Endocarditis

Gene transfer

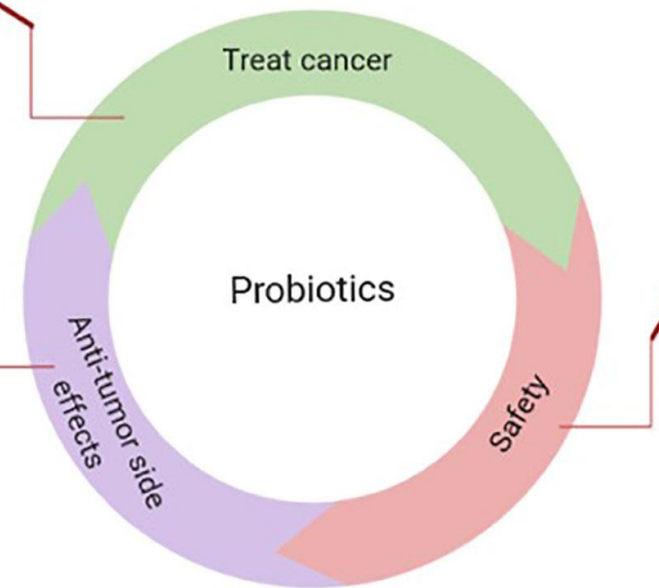
- Antibiotic resistance

Skin

- Rash
- Acne

Susceptible population

- Infant
- The elder
- Hospitalized people
- Immunodeficiency patient



Fact: incorporate food sources in diet

- Incorporate moderate amounts dietary sources in diet
 - Yogurt
 - Kimchi
 - Kefir
 - Saurkraut
- Pair probiotic with prebiotic
 - Banana
 - apple



Myth: “High-dose antioxidants are safe”

- Free radicals: reactive oxygen species
- Antioxidants scavenge free radicals to limit cell damage
- Examples
 - Vitamin C
 - Vitamin A
 - Vitamin E
- Cause harm by:
 - Reducing effectiveness/toxicity of cancer treatment
 - Protecting tumor cells
 - Worse outcomes, especially if smokers
 - Promoting tumor growth

Fact: eat dietary sources antioxidants

- Vitamin C
 - Oranges, strawberries
- Vitamin A
 - carrots, sweet potatoes
- Vitamin E
 - Sunflower seeds, almonds, peanuts



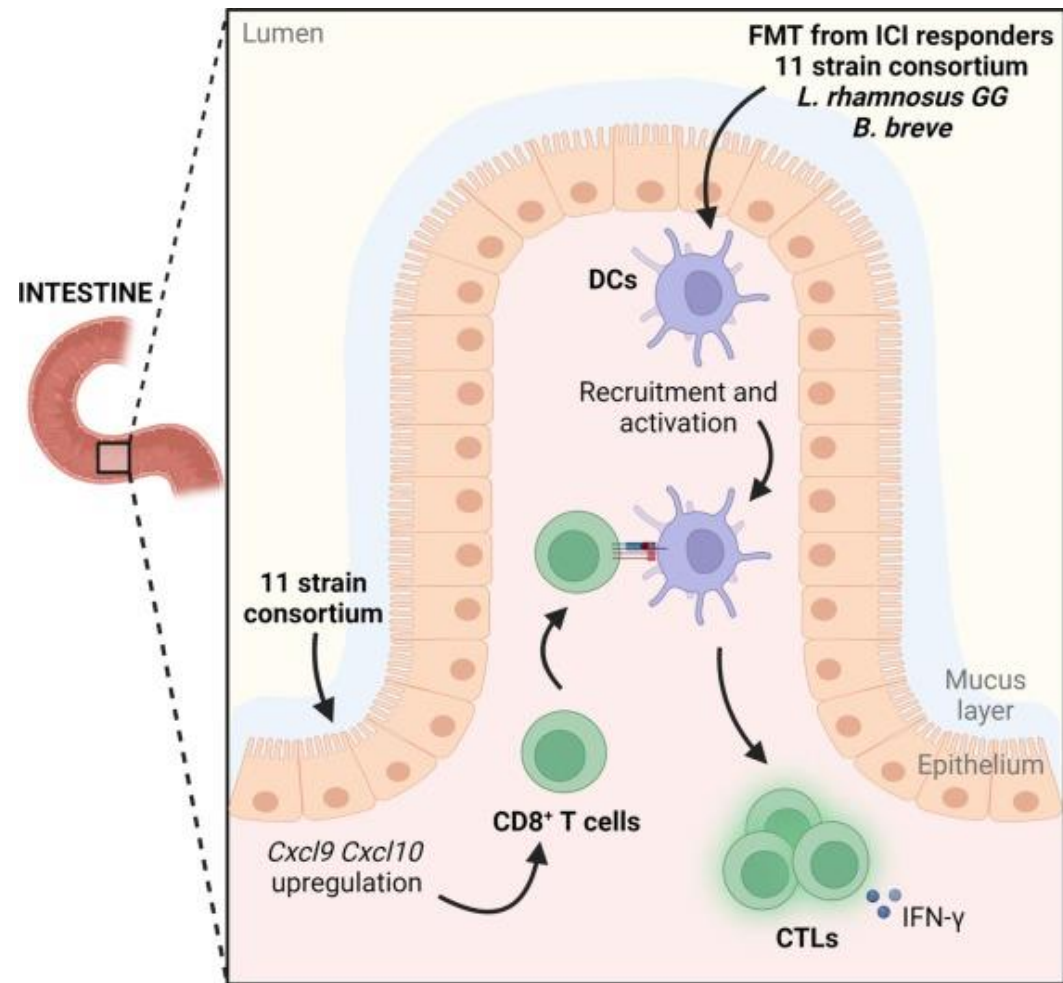
Myth: “I should go vegan”

- Excludes
 - meats, dairy, eggs
- Includes
 - Vegetables, fruits, whole grains, legumes, soy products
- Risk for
 - Vitamin B12 deficiency
 - Vitamin D/calcium deficiency
 - Anemia (iron)
 - Zinc deficiency
 - Protein deficiency



Microbiome and Immunotherapy

- Gut microbiome: key role in immune checkpoint inhibitors (ICIs) response
 - Mobilize innate and adaptive immune cells
 - Override inhibitory TME
- More fiber = more diverse gut microbiome
- Hypothesis: vegan diet → better response?



Effect of **D**iet and **E**xercise on immu**N**otherapy and the microbiome

- Diet is major modulator of microbiome
- Exercise shown to increase gut diversity
- High fiber, plant-based diet + 150 minutes moderate exercise



Fact: aim for balanced diet

- 2020-2025 Dietary Guidelines for Americans
 - Variety of fruits
 - Variety of vegetables
 - Low-fat dairy
 - Grains, half of which are whole grains
 - Lean meats
 - Limit added sugar
 - Limit saturated fat
 - Consume <2300 mg sodium per day

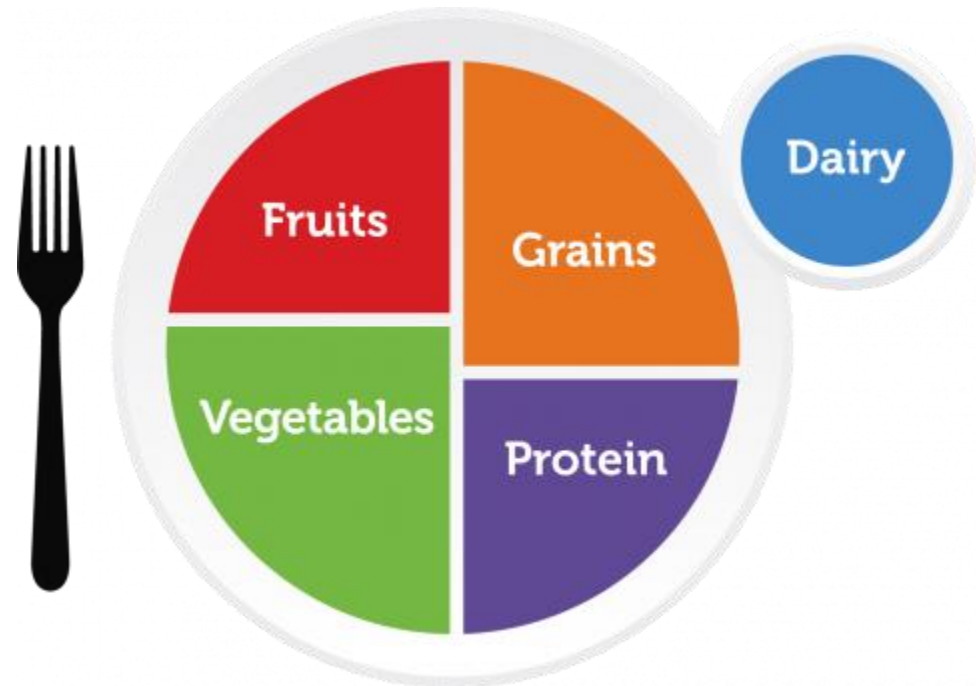


Myth: “I should follow a ketogenic diet”

- Ketogenic diet: high fat, low carbohydrate, low to moderate protein
 - 90% fat, 2% carb, 8% protein
- Ketogenic diet can emulate a fasted state → fat metabolism
- 9 studies looking at tumor effect
 - 2 reported negative results
 - 2 reported diverse results
 - 4 reported no difference
 - 1 reported alteration in cancer cell metabolism
- Inconsistencies, differences in study design, minimal studies
- Need more studies!

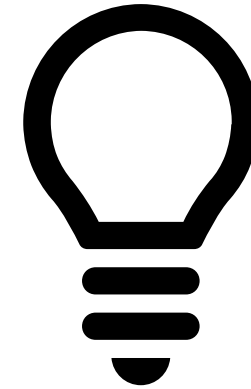
Fact: eat fats, but eat carbs and protein too

- Ketogenic diet: hard to follow
 - 17% adherence in one study
- Could lead to unintentional weight loss
- Eat a well-balanced diet - MyPlate



<https://www.myplate.gov/>

What do we do now?



Cancer resources

- AICR: <https://www.aicr.org/>
- Academy Nutrition and Dietetics: <https://www.oncologynutrition.org/erfc>
- American Cancer Society: <https://www.cancer.org/cancer/managing-cancer/side-effects.html>
- Cancer.net: <https://www.cancer.net/navigating-cancer-care>
- Cook for your life: <https://www.cookforyourlife.org/>
- MSKCC About Herbs: <https://www.mskcc.org/cancer-care/diagnosis-treatment/symptom-management/integrative-medicine/herbs>
- NCCN: <https://www.nccn.org/>
- NCCIH: <https://www.nccih.nih.gov/>
- NCI, Eating Hints booklet: <https://www.cancer.gov/publications/patient-education/eating-hints>

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Thank you!
