

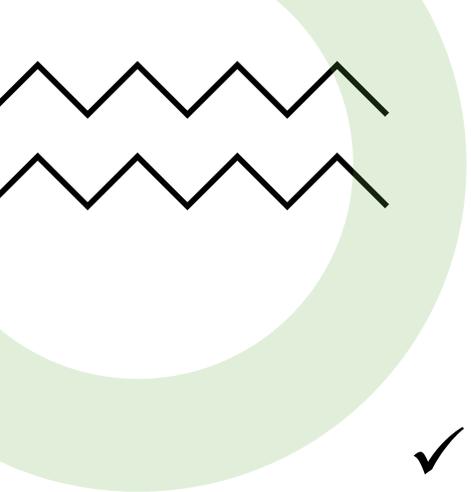


SUMMERVILLE

Family Health Team

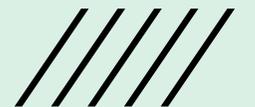
**NUTRITION
&
IMMUNITY**

Healthy Aging
Education Series Presentation
June 1, 2022
Joanne Bak, RD



AGENDA

- ✓ What is Immunity ?
- ✓ Nutrition & our Immune System
 - 7 Key Nutrients
 - Prebiotics, Probiotics & the Gut Microbiome
 - Other Foods to Boost Immunity
- ✓ Mediterranean Diet & Immunity
 - Meal & Snack Ideas
 - Kitchen Toolkit for Immune Health





WHAT IS IMMUNITY?

Immunity refers to the body's ability to resist harmful microorganisms or **pathogens** such as viruses & bacteria that can cause disease.

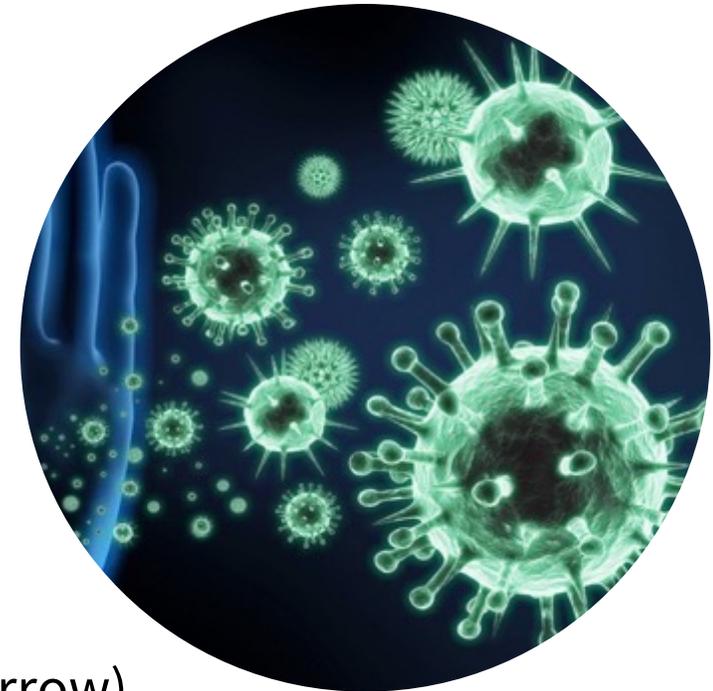
Immune System: body's defense & repair system

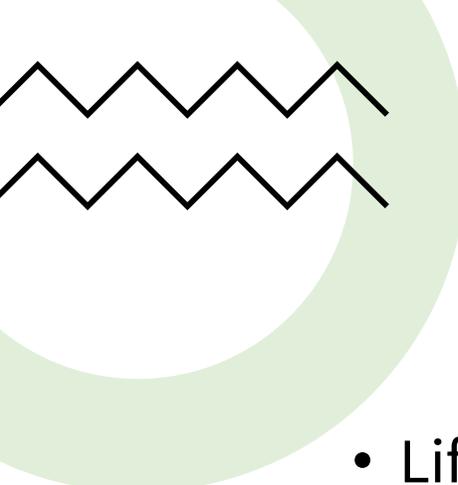
1. Innate:

- skin, mucous membranes in our mouth, nose and GI tract
- WBC such as neutrophils, macrophages, natural killer cells

2. Acquired:

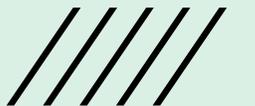
- creates specific attackers in response to specific pathogens
- produced mainly by the T cells (Thymus) and B cells (Bone marrow)





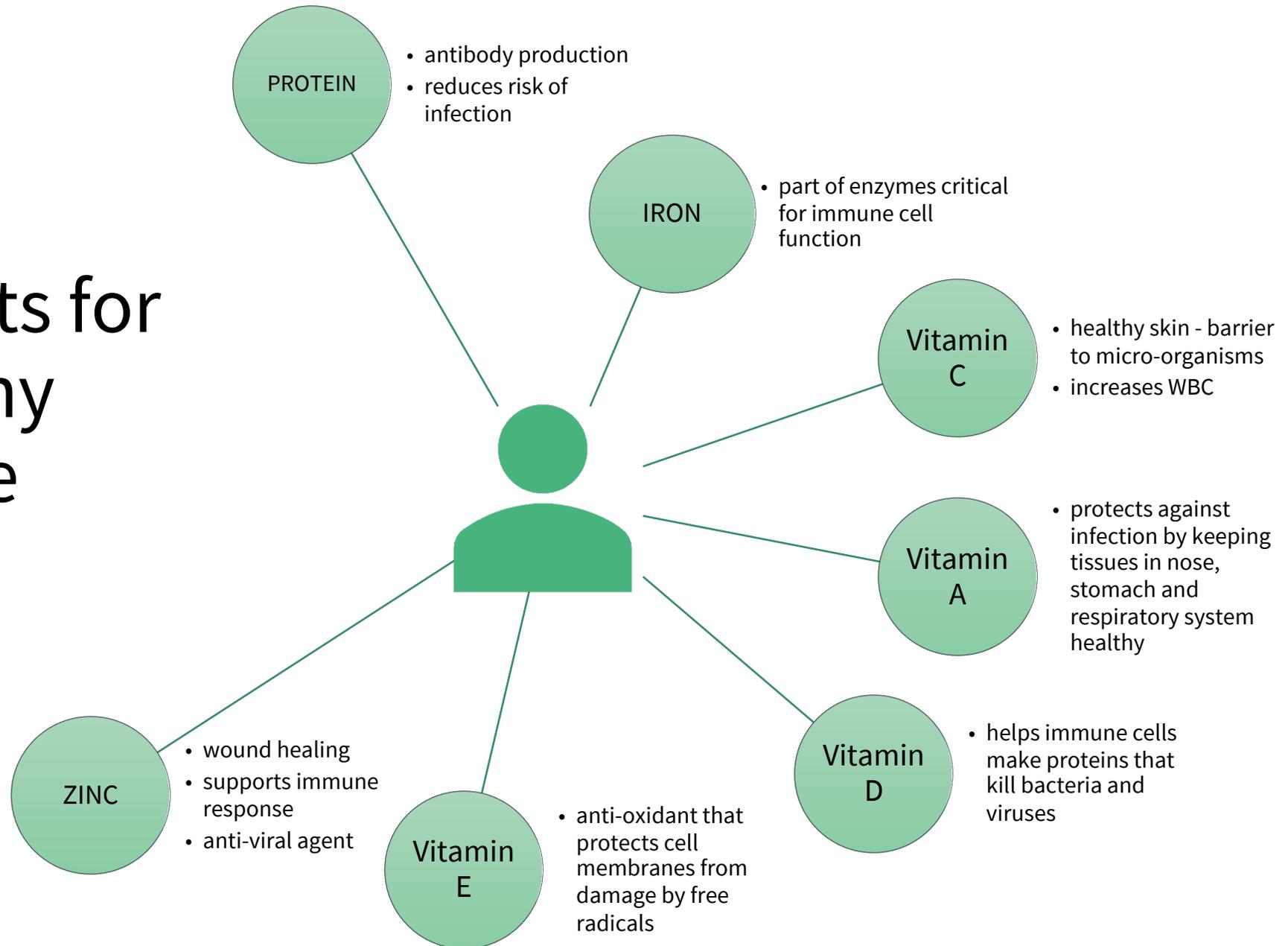
FACTORS THAT SUPPRESS IMMUNITY:

- Life stage: older age, pregnancy, infancy
- Environmental toxins: smoke & chemical contaminants etc.
- Excess weight
- Chronic diseases: heart disease, diabetes, cancer, autoimmune diseases
- Chronic mental stress
- Lack of sleep
- Poor Diet – "Western Diet"
 - High in processed foods, sugars, saturated/trans fats
 - Low in fibre rich carbs, micronutrients, healthy fats





7 Key Nutrients for a Healthy Immune System



○ Prevalence of Nutrient Deficiencies in Canadian Adults

VITAMINS

Inadequate Dietary Intakes of:

- Vitamin A ~ 47%
- Vitamin C ~25% (non-smokers)
~59% (smokers)
- Vitamin D ~ 94%

MINERALS

Inadequate Dietary Intakes of:

- Iron ~ 30% (females 19-50 yrs)
- Calcium ~ 44%
- Potassium ~ 60%
- Magnesium ~45%



○ POLL: Which of the following are immune boosting foods? Choose all that apply.

- Mushrooms
- Fish
- Lentils
- Kiwi
- Sweet potato
- Green tea
- Garlic, ginger, turmeric
- Whole grains
- Kim chi
- Broccoli



PROTEIN

Key foods:

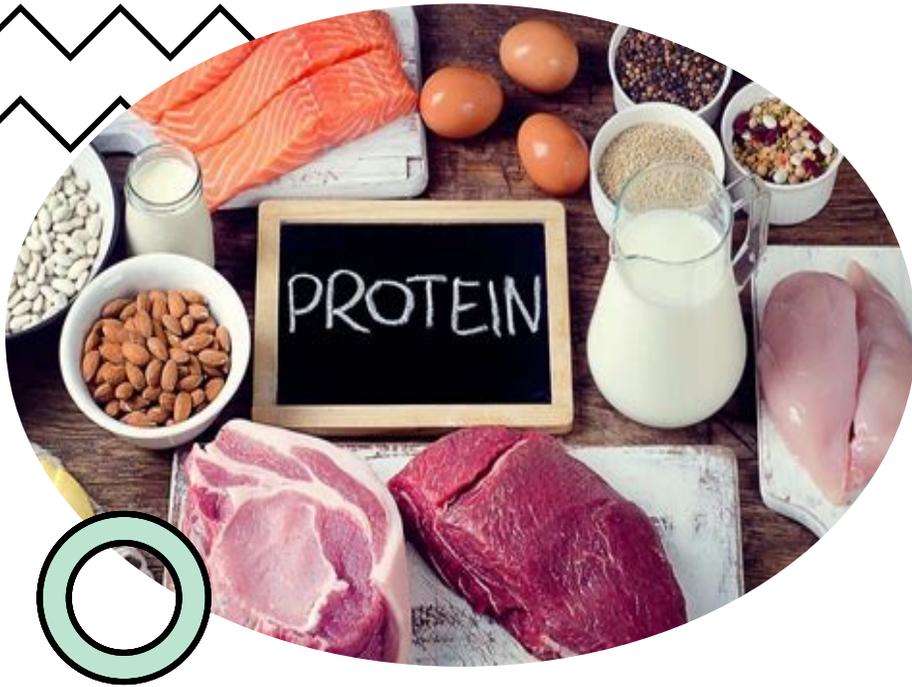
- ✓ Fish, poultry, lean red meats, dairy, eggs
- ✓ Legumes, soy, nuts, seeds

How much do I need?

- **RDA = 0.8 g/kg/day***
 - amount to prevent illness in 98% of the population

- * For optimal health **1.2 – 2.0 g protein/kg/day**

- Sedentary adults – lower end
- Athletes – higher end
- **Older adults** – mid point
 - Prevent muscle wasting / osteoporosis (exception: advanced kidney disease)



Example:

- 65 year old, 155 lb (70 kg) adult
- Target: 84-105 g protein / day
(based on 1.2 – 1.5 g protein/kg/d)

RDA = Recommended Dietary Allowance



PROTEIN

Meet your protein needs ... without the math!



Tips:

- Include protein rich foods at all meals and snacks
- An average serving of protein rich foods:
 - palm sized amount of meat (3-4 ounces)
 - 1-2 eggs
 - 1 cup cow or soy milk
 - 50 g of cheese (= 6 stacked dice)
 - 1/2- 3/4 cup yogurt
 - 1/2 - 3/4 cup legumes (e.g. lentils & beans) or tofu
 - 2 Tbsp of nut butter
 - 1/4 - 1/2 cup nuts

Most protein rich foods are also rich in **IRON** (except milk products)



○ IRON

How much do I need?

RDA* =

- **Men** 8 mg/day (19 years and older)
- **Women**
 - Pre menopause is **18** mg/day
 - Post menopause is **8** mg/day

**If you are vegetarian, your iron needs can be up to 1.8 times higher.*

History of anemia?

- Focus on iron rich food sources
- Check with your doctor if a supplement is required
- Too much iron can lead to immune suppression





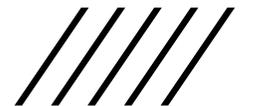
IRON

Key Foods:

- **Lean beef, pork, poultry, fish**
 - *heme iron, well absorbed*
- **Eggs, soy foods, beans & lentils, grains**
 - *non-heme iron, not well absorbed*
 - to boost your absorption of non-heme iron pair with:
 - heme food source OR
 - Vit C rich foods such as citrus, kiwi, avocado, broccoli, tomatoes, bell peppers

Winning Vegetarian Combinations:

- Enriched pasta + tomato lentil sauce
- Falafel wrap + orange
- Oatmeal + soy beverage + berries
- Mixed greens + egg + broccoli + cherry tomatoes + avocado



○ VITAMIN C

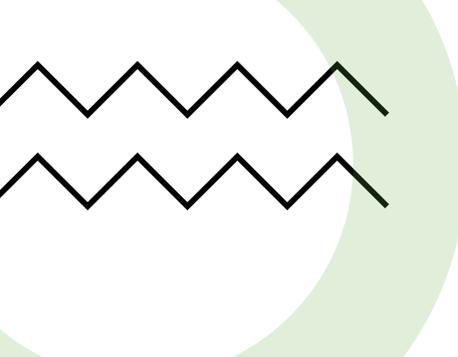
How much do I need?

- **RDA = Men 90** mg/day
Women 75 mg/day
- People who smoke need an extra 35 mg/day
- Our bodies do not store Vit C so it's important to get what you need every day
 - Plan a fruit and/or veggie with each meal or snack

A background image consisting of a dense pattern of sliced oranges, showing the bright orange flesh and white pith. The slices are arranged in a slightly overlapping, circular pattern.

Did you know, Vitamin C is the most easily destroyed vitamin?





VITAMIN C

Key foods:

- Citrus, kiwi, bell peppers, broccoli, guava, strawberries

Tips to preserve Vitamin C:

- ✓ Keep your freezer fresh!
 - Frozen fruits & veggies lose much of their Vit C content if stored longer than 2 months
- ✓ Cook vegetables in as little water and for as short a time as possible
 - steam or stir fry until tender crisp
- ✓ Cooking vegetables in a casserole preserves Vit C content (vs. boiling in water)



○ VITAMIN A

How much do I need?

- RDA = **Men 900** mcg or RAE/day
Women 700 mcg or RAE/day

Retinol (pre-formed Vit A):

- animal foods
- stored in our liver for a long time
- Upper Limit: 3000 mcg/d

Carotenoids:

- orange & dark green vegetables
- short term storage in our body; can convert to retinol when needed



1 medium sweet potato
meets 100% of your day's
requirement



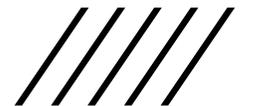
VITAMIN A

Key foods:

- “orange”, “red”, “dark green” vegetables & fruits:
 - ✓ sweet potatoes, carrots, pumpkin, squash, red peppers
 - ✓ cantaloupe, mango, dried apricots
 - ✓ spinach, broccoli

Tip:

- Aim to eat one orange and one dark green veg or fruit daily (Health Canada)



○ VITAMIN D

How much do I need?

- **RDA = 600 IU/day** (9 - 70 yrs)
800 IU/day (>70 yrs)
- Many health experts believe the RDA is too low
- Upper Limit for safety: 4000 IU/d

Key foods:

Fatty fish like salmon, sardines, herring

Egg yolks

Mushrooms*

Vitamin D fortified foods:

- ✓ milk, margarine, milk alternatives such as soy milk
- ✓ some yogurts, orange juice & cereals (check labels)

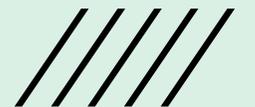


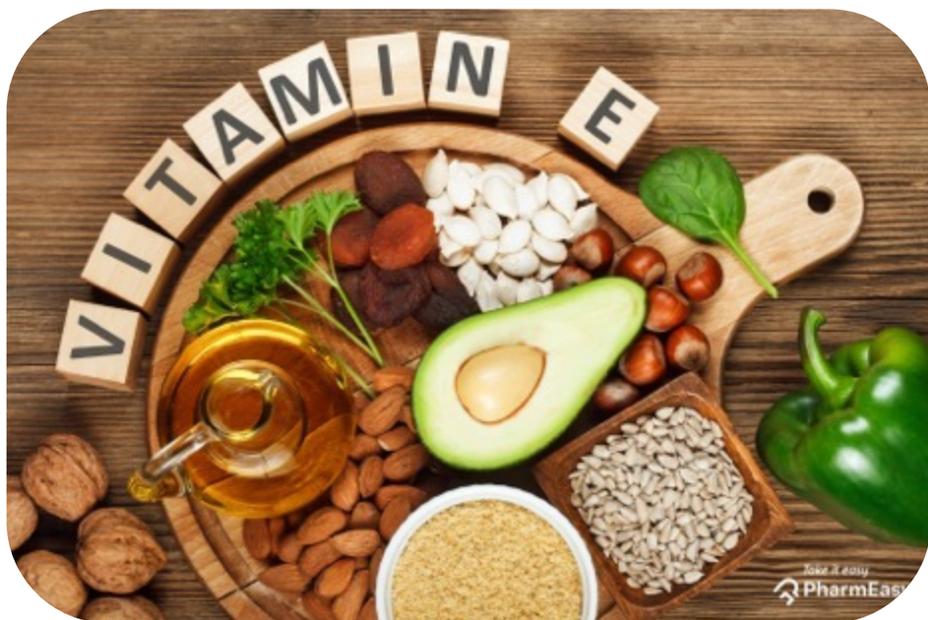
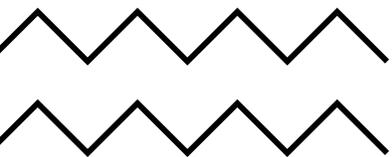


VITAMIN D

Tips:

- Difficult to get enough through diet alone
- Summer sunshine isn't enough especially as we get older, or limit sun exposure
- **Supplement is usually recommended – 1000 IU/d is a typical, safe dose**
 - ✓ Tablet: Take with largest meal for optimal absorption
 - ✓ Drop: Take anytime





How much do I need?

RDA = 15 mg/day (19 yrs +)

Most people get enough

VITAMIN E

Key foods:

- ✓ almonds, sunflower seeds, peanuts
- ✓ vegetable oils, wheat germ, avocado
- ✓ rainbow trout, salmon
- ✓ tomato sauce, cooked spinach/swiss chard

Tips:

- Whole grains include the germ – choose most often
- Enjoy a handful of nuts 4 x/week or more
- Ideas:
 - ✓ Add avocado to whole grain toast or crackers
 - ✓ Enjoy fish with spicy tomato sauce & sauteed greens
 - ✓ Enjoy apple or pear slices with almond or peanut butter

ZINC

How much do I need?

- **RDA = Men 11 mg/day**
Women 8 mg/day
- **Upper Limit: 40 mg/day**

Key foods:

- ✓ Legumes, nuts, seeds
- ✓ Milk, meats, shellfish

Tips:

- Our bodies do not store zinc so it's important to get what you need every day



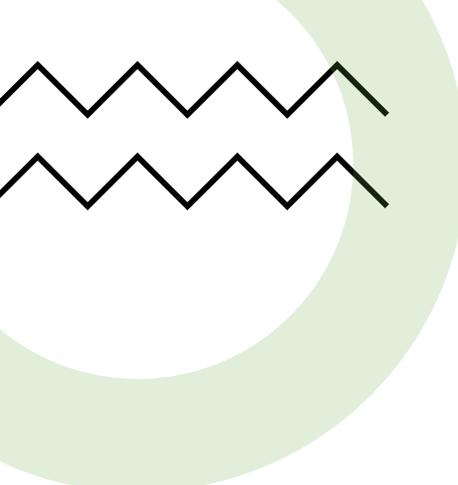


ZINC

Supplement Considerations:

- Research - questionable benefit in a well-nourished person
- People at risk for zinc deficiency: elderly, vegetarians/vegans, chronic diarrhea
 - discuss with your Health Care Provider first; may interfere with medications
- Generally considered safe if taken orally, *short term*, not exceeding the Upper Limit of 40 mg/d
 - Long term use or higher dose can -> copper deficiency (neurological issues)
 - Side effects may include: indigestion, diarrhea, headache, nausea, vomiting
- NOT safe as a nasal spray – may cause permanent loss of smell





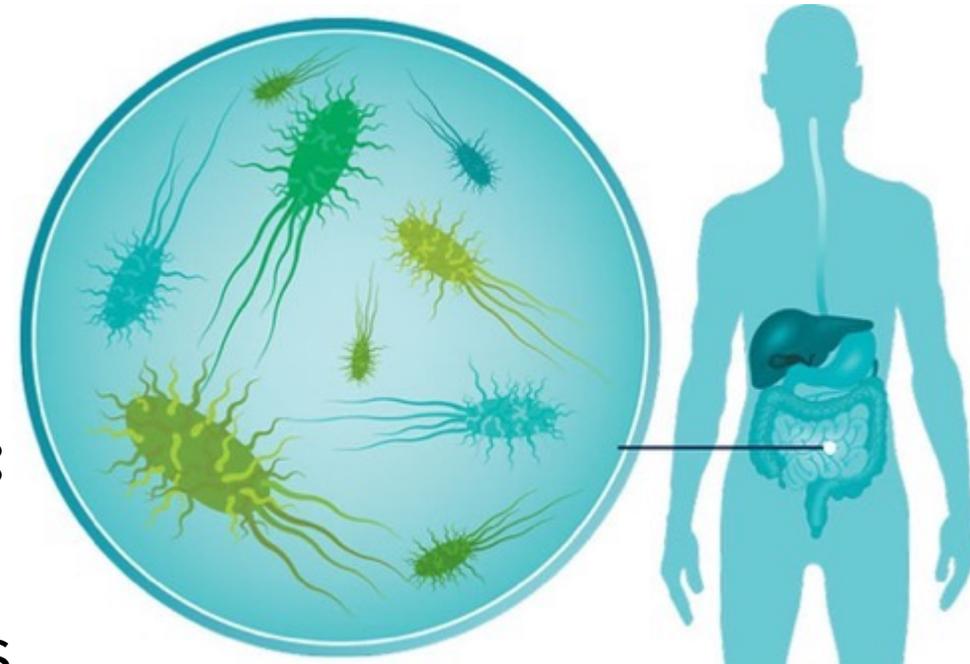
GUT MICROBIOME

70% of immune system cells are located in our gut

- Supports immune system cells
- Maintains immune tolerance
- Intestinal barrier integrity

Our gut microbiome changes in response to:

- Our diet
- Environmental factors such as antibiotics
- Age





GUT MICROBIOME

PROBIOTICS

- live bacteria that provide us with a health benefit
- help control harmful microorganisms like germs

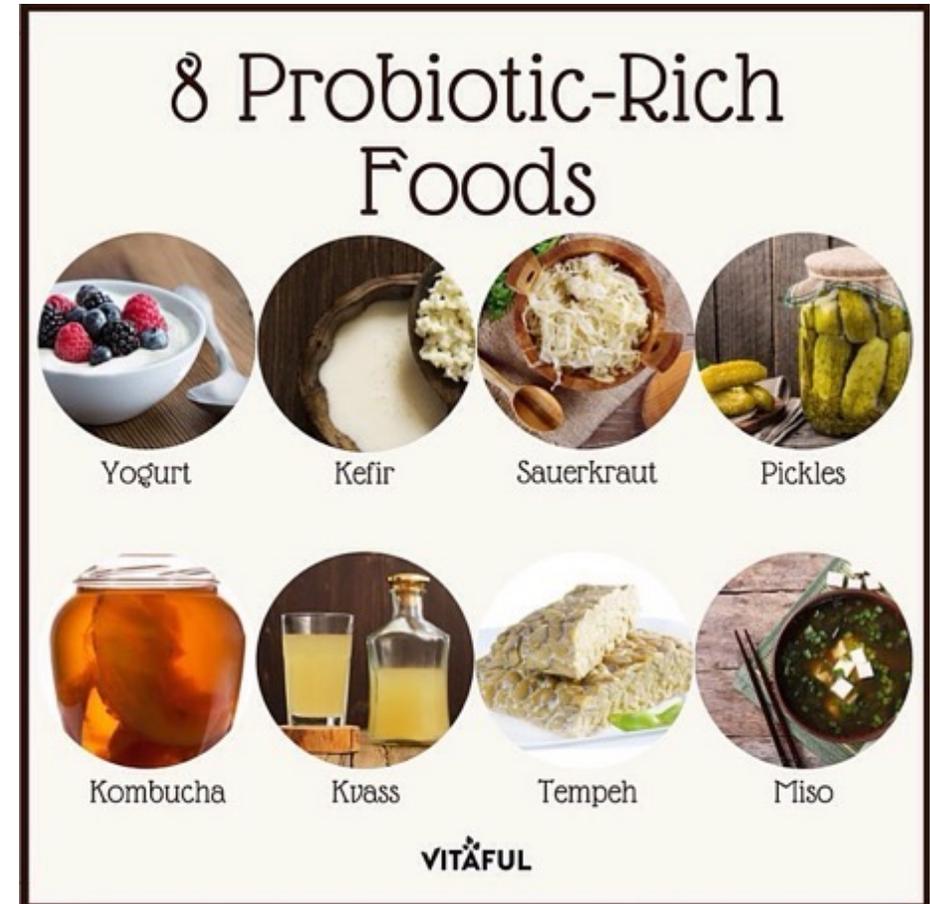
Key Foods: Fermented foods

What is fermentation?

- Process where components of foods, like natural sugars, are broken down by yeast & bacteria into other beneficial substances -> probiotics

BUT, not all fermented foods are probiotics

- “probiotic yogurts” are, other yogurts are not
- non-pasteurized pickles are (sold refrigerated),
canned are not





GUT MICROBIOME

PREBIOTICS

- Fibre (from healthy foods) that the probiotic bacteria eat
- Enhance gut cell barrier function

Key Foods:

- Jerusalem Artichoke
- Dandelion greens
- Garlic
- Leeks
- Onion
- Asparagus
- Wheat bran
- Whole wheat flour
- Bananas
- Chicory root (called inulin); found in some fortified foods

Foods High in Prebiotics



Wheat



Jerusalem
artichokes



Onions



Leeks
(the bulb)



Jicama



Potatoes
(cooked
and cooled)



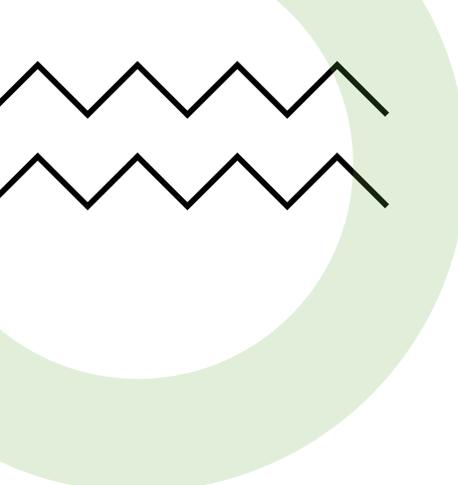
○ GUT MICROBIOME

Supplement Considerations

- **Prebiotics** – naturally present in high fibre foods: vegetables, fruits, whole grains, & legumes; supplements not needed
- **Probiotics** (food/supplements) are considered safe for most people*
 - Side effects most common: gas and bloating
 - Increase pre and probiotics slowly
 - Choose a variety of fibre rich and fermented foods daily
 - Supplements: may be helpful for certain digestive conditions
 - www.probioticchart.ca Evidence based Canadian resource

* Check with your doctor before starting a probiotic. Probiotics may be harmful for some people with chronic illnesses or weakened immune systems.





OTHER FOODS THAT BOOST IMMUNITY

Mighty Mushrooms

- Beta-glucans, a type of fibre in mushrooms, are particularly helpful in reversing age-related decline in immune function
- Eat a variety of mushrooms; different types have different benefits
 - boost our immune system
 - improve type and quantity of good bacteria in our gut
 - reduce inflammation





OTHER FOODS TO BOOST IMMUNITY



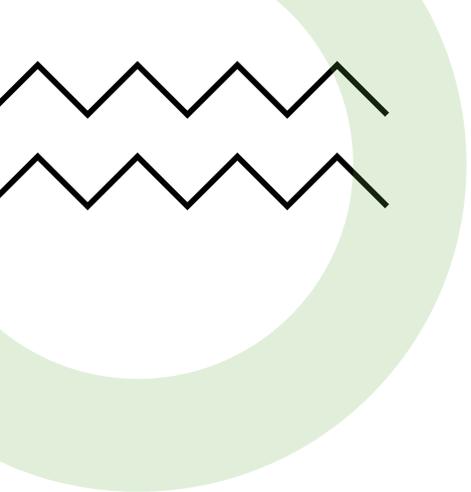
Green Tea

- Black and green tea come from the same plant, *Camellia sinensis*
- Flavonoids in both black and green tea are anti-oxidants
 - EGCG (epigallocatechin gallate) has been shown to enhance immune function BUT it is only found in green tea
- Why the difference?
 - Black tea is fermented which destroys much of the EGCG
 - Green tea is steamed and not fermented

Tips:

- While Matcha is revered for its high quality/health benefits, it is most important to find a type of green tea that you enjoy
- Too bitter?
 - Steeped too long? Water too hot?





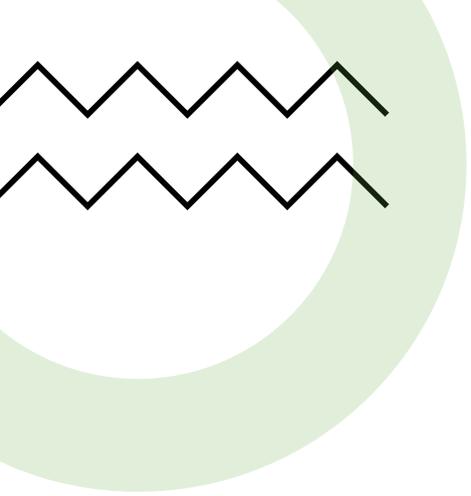
OTHER FOODS TO BOOST IMMUNITY

Garlic

- Allicin – main active ingredient in garlic
- consumed fresh can have an effect against bacteria and viruses
 - Let sit 10 min after chopping before you eat it or heat it!

Caution: blood thinning effects – fresh/dry garlic or supplements





OTHER FOODS THAT BOOST IMMUNITY



Turmeric

- Curcumin – the most studied active compound in turmeric
- strongest anti-inflammatory of all spices, plays important role in our immune system
- antibacterial, antiviral & antioxidant properties

Caution - supplements:

- Safety data for long term use is lacking
- Avoid if you have gallstones, bile duct obstruction or if pregnant

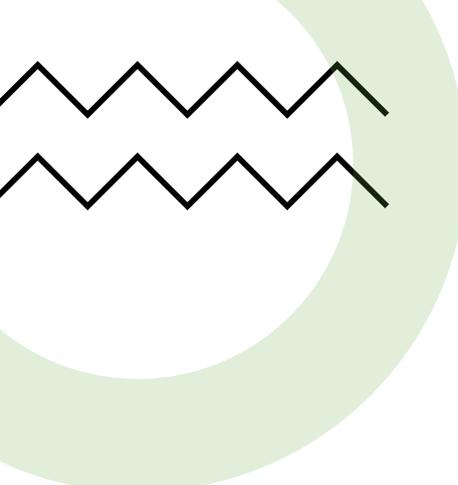
Ginger

- at least 14 active compounds - Gingerols most prevalent
- anti-nausea & anti-inflammatory properties
- antimicrobial potential to help treat infectious diseases

Caution - supplements:

- Blood thinning effects
- Certain blood pressure meds





Tips for using Turmeric and Ginger

- Add dry or fresh to marinades, stir fries, stews, soups, smoothies, or make into a tea

GINGER & TURMERIC TEA

INSTRUCTIONS:

1. Peel and slice 1-2 inches each ginger & turmeric root
2. Add about 4 cups boiling water. Let steep about 10 minutes
3. Strain tea to discard ginger & turmeric pieces
4. Add a pinch of ground black pepper
 - * this is very important – boosts absorption of curcumin into the body
5. Serve with honey, lemon and cinnamon (optional)



○ IMMUNE BOOSTING DIET

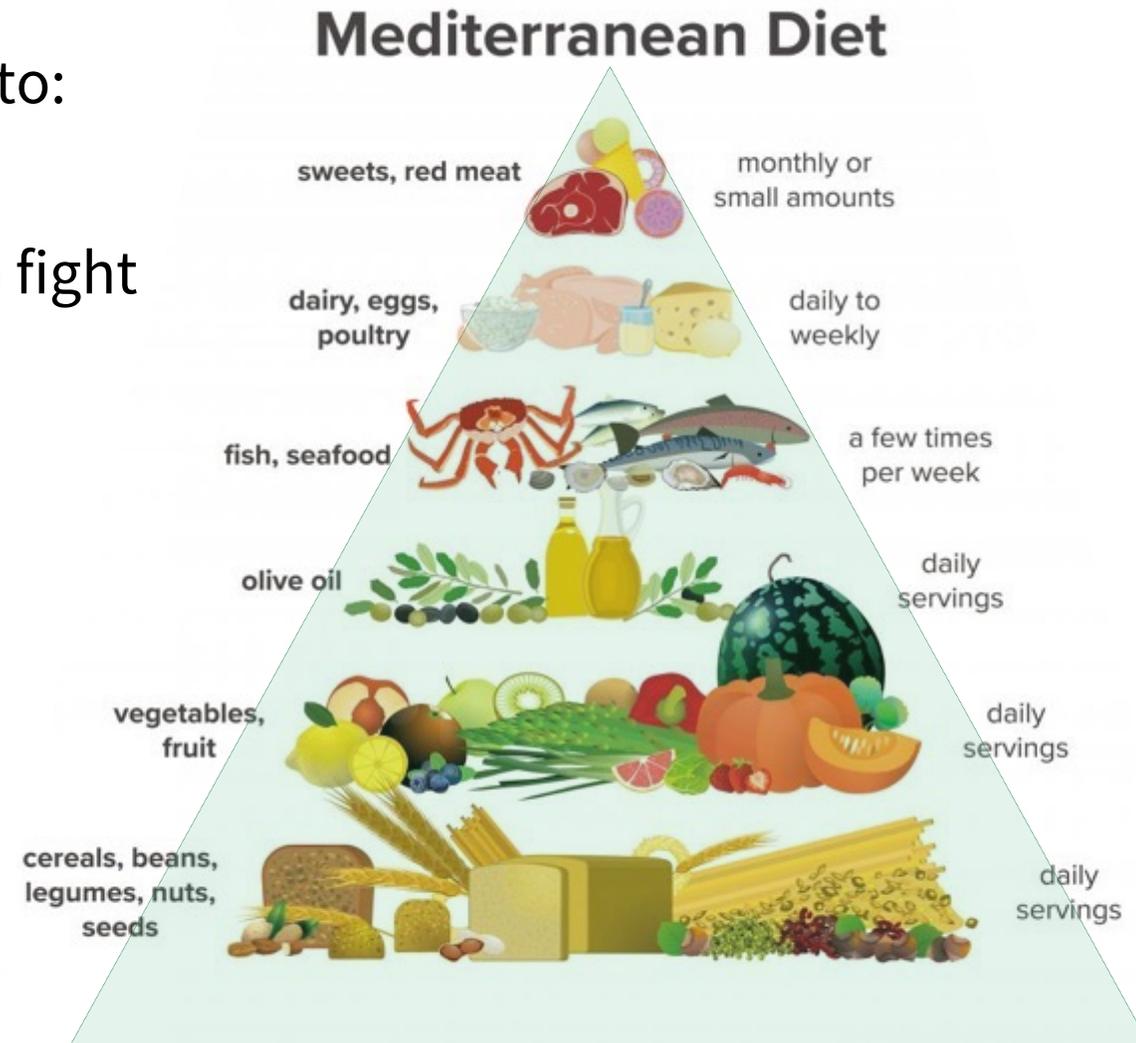
Following a healthy, nutritious diet helps us to:

- strengthen our immune system &
- ensure our body is in the strongest state to fight invaders & recover quickly

Mediterranean Diet is the most extensively studied whole foods diet pattern rich in:

- **Vegetables & fruits**
- **Nuts**
- **Legumes & whole grains**
- **Fish & healthy fats**

associated with reduced risk of chronic diseases and supporting a strong immune system





Immune Boosting Meal & Snack Ideas

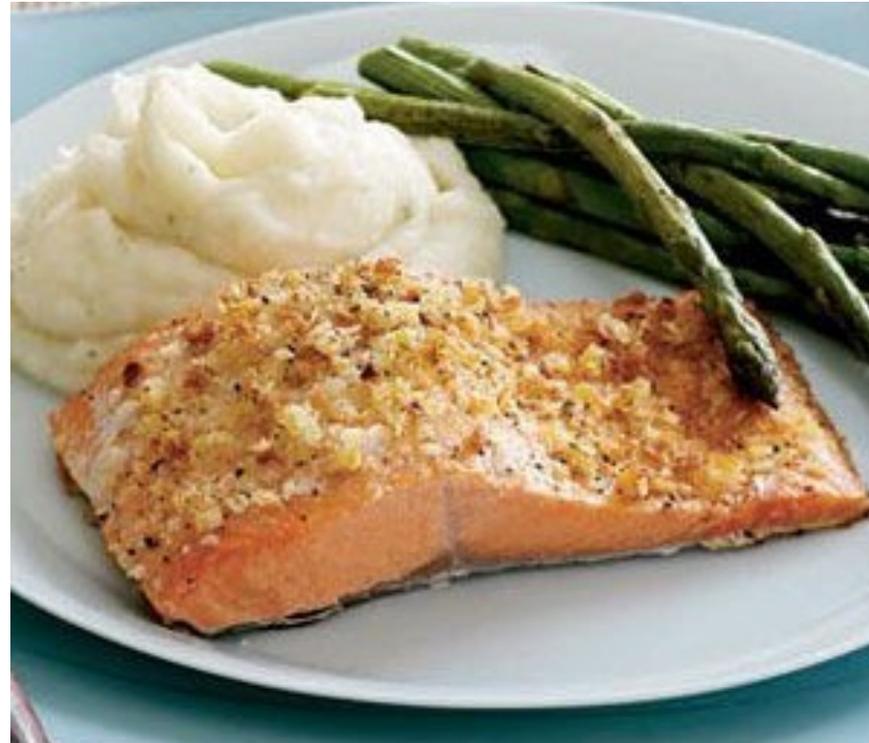
○ Baked Salmon, Asparagus & Garlic Mashed Potatoes

Mashed Potatoes

- Vit C
- Prebiotic (if skin included)

Garlic

- Prebiotic



Asparagus

- Vit C
- Iron
- Prebiotic

Salmon

- Protein
- Iron
- Vit A
- Vit D
- Vit E

Cost Saving Tips:

- If asparagus is not in season, buy a fresh vegetable that is or substitute frozen mixed vegetables instead
- Make fish cakes from canned salmon or tuna instead of fresh or frozen filets



○ Vegetarian Power Bowl

Tomatoes

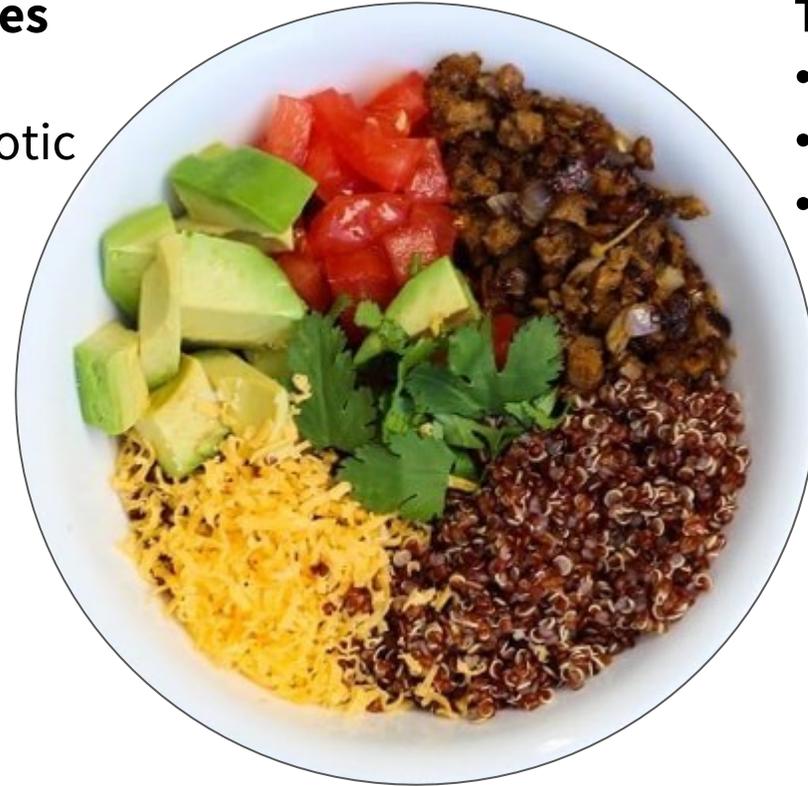
- Vit C
- Prebiotic

Avocado

- Vit C
- Vit E
- Prebiotic

Cheese

- Protein
- Zinc



Tofu or Tempeh Crumbles

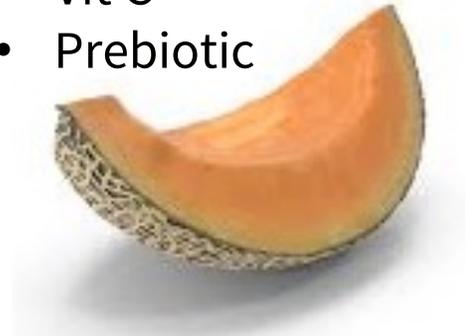
- Protein
- Iron
- Probiotic (tempeh)

Quinoa

- Zinc
- Iron
- Vit E
- Protein
- Prebiotic

Cantaloupe

- Beta carotene (Vit A)
- Vit C
- Prebiotic



Cost Saving Tips:

- Power bowls are easy to customize:
 - use up last night's veggies (raw/cooked) or roast up a tray of veggies ahead of time for multiple meals
 - tofu and beans are inexpensive proteins, but use up left over meats to prevent spoilage / waste
 - skip the cheese
 - swap left over rice or roasted potatoes for the quinoa



○ Hummus, Veggies & Whole Grain Pita

Hummus

- Protein
- Iron
- Vit E
- Prebiotic



Veggies

- Vit C
- Beta carotene (Vit A)
- Prebiotic

Whole Grain Pita or Crackers

- Vit E
- Prebiotic

Cost Saving Tips:

- Buy vegetables in season and those that keep well such as carrots, celery
- Make your own hummus with canned chickpeas, garlic powder
- Use or buy day old pita or wraps, bake in the oven to make crisp crackers



○ Yogurt, Fruit & Granola

Probiotic Yogurt

- Protein
- Probiotics
- Zinc



Fruit

- Vit C
- Prebiotic

Granola with wheat germ & sunflower seeds

- Vit E
- Iron
- Zinc

Cost Saving Tips:

- Use frozen or canned fruits in place of fresh
- Buy the yogurt on sale and/or the large tub vs individual containers
- Make your own granola using just a few ingredients vs buying a box off the shelf – often healthier too!



○ Apple Slices, Peanut Butter & Tea

Apple:

- Vit C
- Prebiotic

Peanut Butter

- Protein
- Vit E
- Iron
- Zinc



**Turmeric & Ginger
or Green Tea**





Kitchen Toolkit for Immune Health

VEGETABLES

- Onion, Leek
- Mushrooms
- Asparagus
- Broccoli
- Spinach, Kale
- Sweet peppers
- Tomatoes, Tomato sauce
- Beets, Beet tops
- Squash, Pumpkin, Carrots, Sweet Potato

FRUIT

- Avocado
- Oranges, Grapefruit, Lemons, Limes
- Kiwi
- Berries
- Mango, Papaya, Cantaloupe
- Bananas

HERBS & SPICES

- Garlic, Ginger, Turmeric

PROTEINS

- Nuts & natural nut butters
- Pumpkin seeds, sunflower seeds
- Lentils & beans such as kidney beans, chickpeas
- Tofu, edamame
- Fish: salmon, sardines, mackerel, trout; clams, oysters

PROBIOTICS

- Probiotic yogurt, kefir, kombucha, kim chi, tempeh, miso, sauerkraut

OTHER KEY FOODS

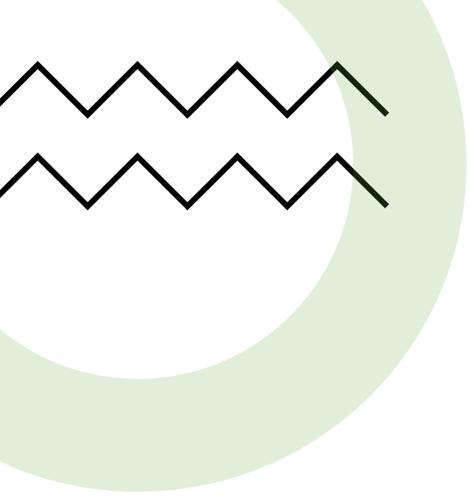
- Whole grain breads, pasta, rice; oats, barley
- Green Tea



○ SUMMARY

- No single food or supplement will prevent or cure disease
- A good quality diet will meet most people's needs for key nutrients that support a strong immune system
 - Evidence supports a whole foods diet with plenty of plant foods such as the traditional Mediterranean diet
 - Limit/reduce processed foods and sweets
- If you feel you cannot eat a varied enough diet or may be at risk for deficiencies speak with your health care provider before starting a supplement
 - Exception: Vitamin D





OTHER IMMUNE BOOSTERS:

- 1) Good night sleep
- 2) Stay physically active
- 3) Manage stress
- 4) Stay hydrated
- 5) Wash hands regularly
- 6) Stay positive



○ Resources

Nutrition & Immunity

- <https://www.hsph.harvard.edu/nutritionsource/nutrition-and-immunity/>
- <https://www.mayoclinichealthsystem.org/hometown-health/speaking-of-health/support-your-immune-function-with-good-nutrition>
- <https://jeanlamantia.com/cancer-bites-diet-blog/immune-health-basics/>
- <https://www.eatright.org/food/vitamins-and-supplements/types-of-vitamins-and-nutrients/how-vitamin-c-supports-a-healthy-immune-system>
- <https://nutritionfacts.org/video/boosting-immunity-through-diet/>

Nutrients & Foods

- www.unlockfood.ca
- <https://cronometer.com>

Recipes & Meal Planning

- <https://oldwayspt.org/traditional-diets/mediterranean-diet>
- www.pulsescanada.com
- www.ontariobbeans.ca
- www.halfyourplate.ca
- <https://itdoesnttastelikechicken.com/recipe-index/>
- <https://ohsheglows.com/2019/03/07/meal-prep-week-long-power-bowls/>
- <https://tasty.co/>
- <https://whisk.com/>



○ Resources

Reducing Food Waste & Budget Friendly Meal Ideas

- <https://www.budgetbytes.com/category/recipes/>
- <https://www.halfyourplate.ca/fruits-and-veggies/store-fruits-veggies/>
- <https://www.wellandgood.com/food-waste-apps/>
- <https://www.niagarahealth.on.ca/files/FoodBankFIRSTrecipebook2010.pdf>

Meal Delivery Service

- <https://www.apetito-hfs.ca/en-ca/>





QUESTIONS & EVALUATION

