The Down Syndrome Diet

Changing the "Course" Through Nutrition

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Disclaimer

This presentation is intended to be informational and educational.

It is not a substitute for individualized medical care or nutritional advice.

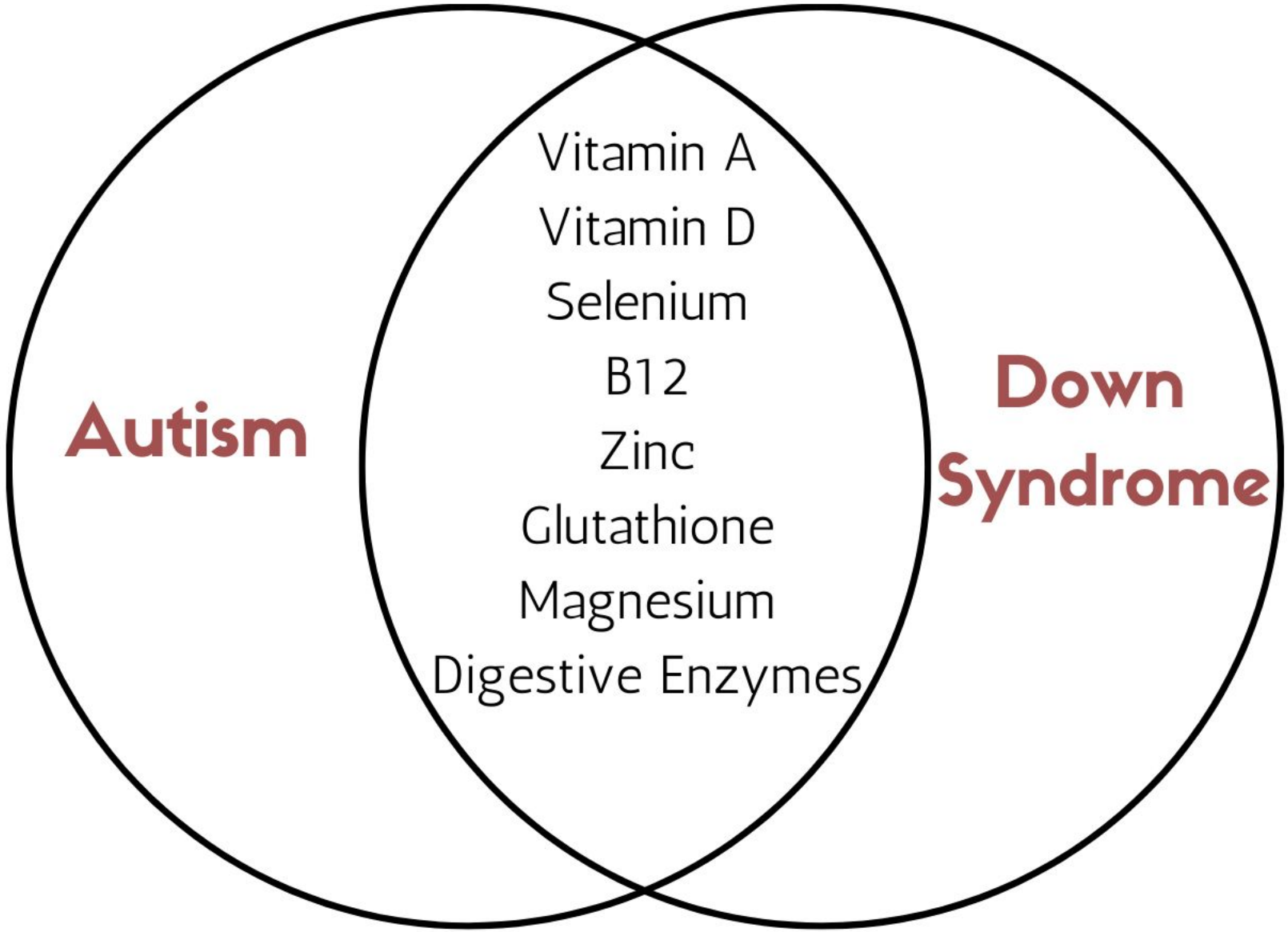
These are general guidelines and principles that may be considered based upon a review of literature and anecdotal evidence.

Common Comorbidities

FOR INDIVIDUALS WITH DOWN SYNDROME

- Hashimoto Thyroiditis
- Diabetes
- Obesity
- Seizures
- Allergies
- ADHD
- Sleep Problems
- Arthritis
- Celiac Disease
- Autism
- G.I. problems
- Alzheimer's
- Recurrent infections (suppressed immune system)

Shared Nutritional Deficiencies



Deficiency Comparison

Bolded items represent traits connected to Autism.

<u>Underlined items represent traits connected to Down syndrome.</u>

EPA
Taurine
Folate
Vitamin C
B6
<u>*Vitamin E*</u>
Elevated antibodies to milk
Elevated antibodies to grains
Imbalance in bacterial flora in the gut

Autism and GF/CF Diet

45% of people

with Autism Spectrum Disorders have gastrointestinal problems.

40% of caregivers

using a GF/CF diet for the past several years report a reduction in symptomatology and even "recovering" children from Autism.

3%-6% prevalence rate

of Celiac Disease in the Down syndrome population.

What is Celiac Disease?

01

An autoimmune disorder where the ingestion of gluten leads to damage in the small intestine.

02

It is estimated to affect 1 in 100 people worldwide.

03

Rate of Celiac in the general population has quadrupled in the past 50 years.

04

Wheat has changed!

Leaky Gut/Intestinal Permeability

- Gluten protein, gliadin triggers Zonulin.
- A protein that increases the permeability between cells of the wall of the digestive track.
- Leads to inflammation and can cause neurological, autoimmune, and mental health problems.
- Gluten interferes with the breakdown and absorption of nutrients.

Gluten Sensitivity

- Antibodies to the gluten are activated and inflammatory cytokines begin collecting and attack the brain.
- Elevated cytokines are seen in Alzheimer's Disease, Parkinson's Disease, MS, and Autism.

"Gluten sensitivity can be primarily, and at times, exclusively a neurological disease." - Dr. Hadjivassiliou

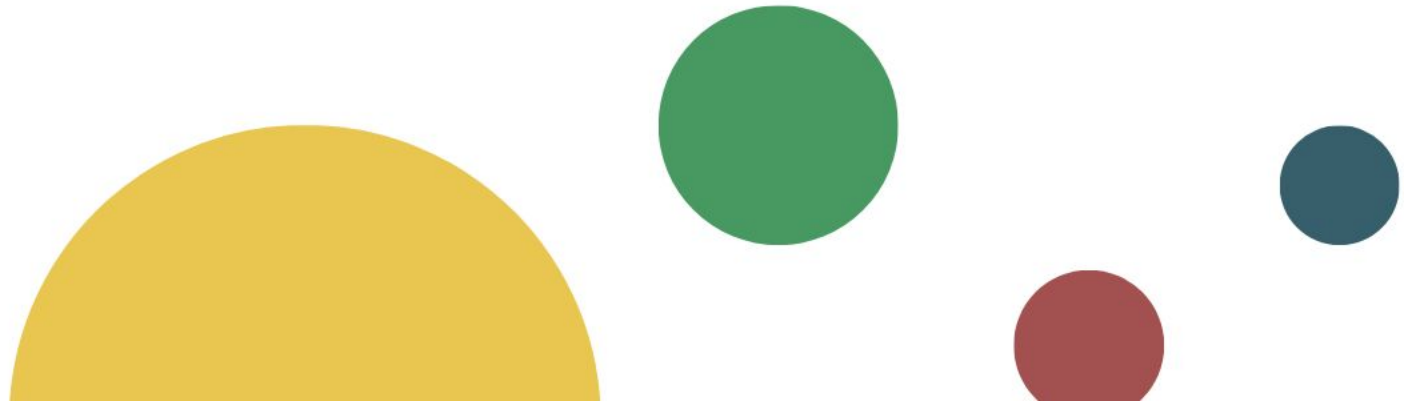
- Therefore, you can have issues with brain function without having any gastrointestinal problems.
- Gluten disables the immune system (Perlmutter).

What else can gluten do?

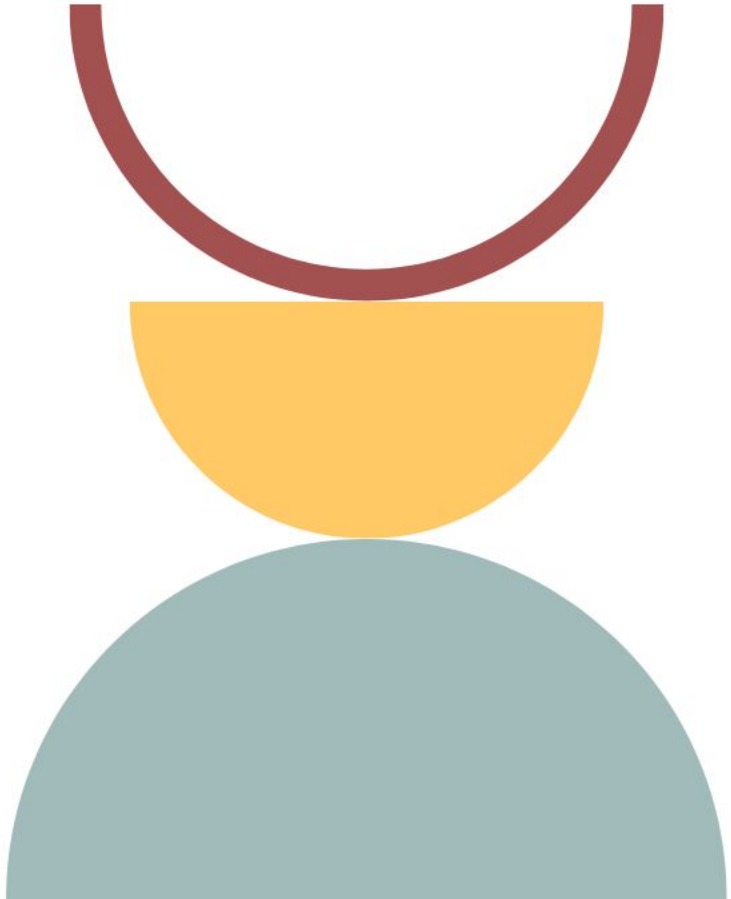
- Link between gluten sensitivity and Hashimoto's thyroiditis - Dr. Perlmutter
- Depression and anxiety are often severe in patients with gluten sensitivity.
- Cytokines block production of serotonin (essential for mood regulation).
- Elimination of gluten and often dairy, many patients have been freed from not just a mood disorder but other conditions caused by an overactive immune system, like allergies and arthritis.

Cognitive Impairment & Diet

- 2006 Mayo Clinic report - link between Cognitive impairment and Celiac Disease
  - Patients with symptoms of dementia at a younger age (n=65 w/ range of 45-79 years old).
  - Patients put on GF diet showed "significant improvement" in their cognitive decline
  - Have researchers discovered a reversible form of cognitive impairment through diet?!



Inflammation



- Can have a positive side effect when it helps your body respond to illness, through a fever and eliminates the virus.
- However, chronic, low-grade inflammation is thought to be one of the leading causes of disease, premature aging, and illness.
- Inflammation is involved in virtually every chronic disease.

Oxidation & Antioxidants

- At the center of chronic inflammation is the concept of oxidative stress.
  - Oxidation in the brain releases a chain of events that creates free radicals and stirs inflammation.
  - Oxidized tissues and cells don't function normally and can lead to health issues.
- Conversely, reduced oxidation lowers inflammation - antioxidants are very important for this reason.

Gluten-free Caution

- If going gluten-free, be careful of added sugars to help with taste and texture.
- Avoid GMOs: 98% of soy, 88% of corn, and 98% of rice are GMO.
- Rice allowed in the USA has high levels of arsenic.
- If using nut-based foods as a replacement, ensure a nut allergy has been ruled out.

The Typical DS Diet

Infants

Formula, filler cereals (rice or gluten-based), yogurt

Toddlers

Puffs, cereal, crackers, juice, yogurt, milk, pasta, potatoes, PediaSure

Children

Pizza, pasta, breads, breaded meats, cereal, crackers, cookies, fries, sandwiches, juice

Adults

Soda (diet or regular), fruit punch, potatoes, breads, breaded meats, pasta

Sugar Count

- AHA daily limit of sugar for children (based on a 1,000-1,200 daily calorie intake) is 4 teaspoons (16 grams).
- However, the average child aged 1-3 years consumes approximately 13 tsps. of added sugar per day.
- The average child aged 4-8 years consumes approximately 21 teaspoons.
- Teenagers aged 14-18 years consume 34.3 teaspoons.
- The average adult consumes 22.2 teaspoons.

Sugar Content

39 grams
12oz soda

36 grams
8oz
applesauce

10 grams
5oz
fruitsnacks

23 grams
8oz apple juice

17 grams
4oz vanilla
yogurt

20 grams
1 Poptart

18 grams
8oz
PediaSure

Sugar and Alzheimer's

Doubled Risk

of developing Alzheimer's if you're a diabetic

3x More Instances

of diabetes in the past 40 years

1/2 of individuals

with diabetes will develop Alzheimer's disease (2011 study)

Alzheimer's is now

being considered as "Type 3 Diabetes"

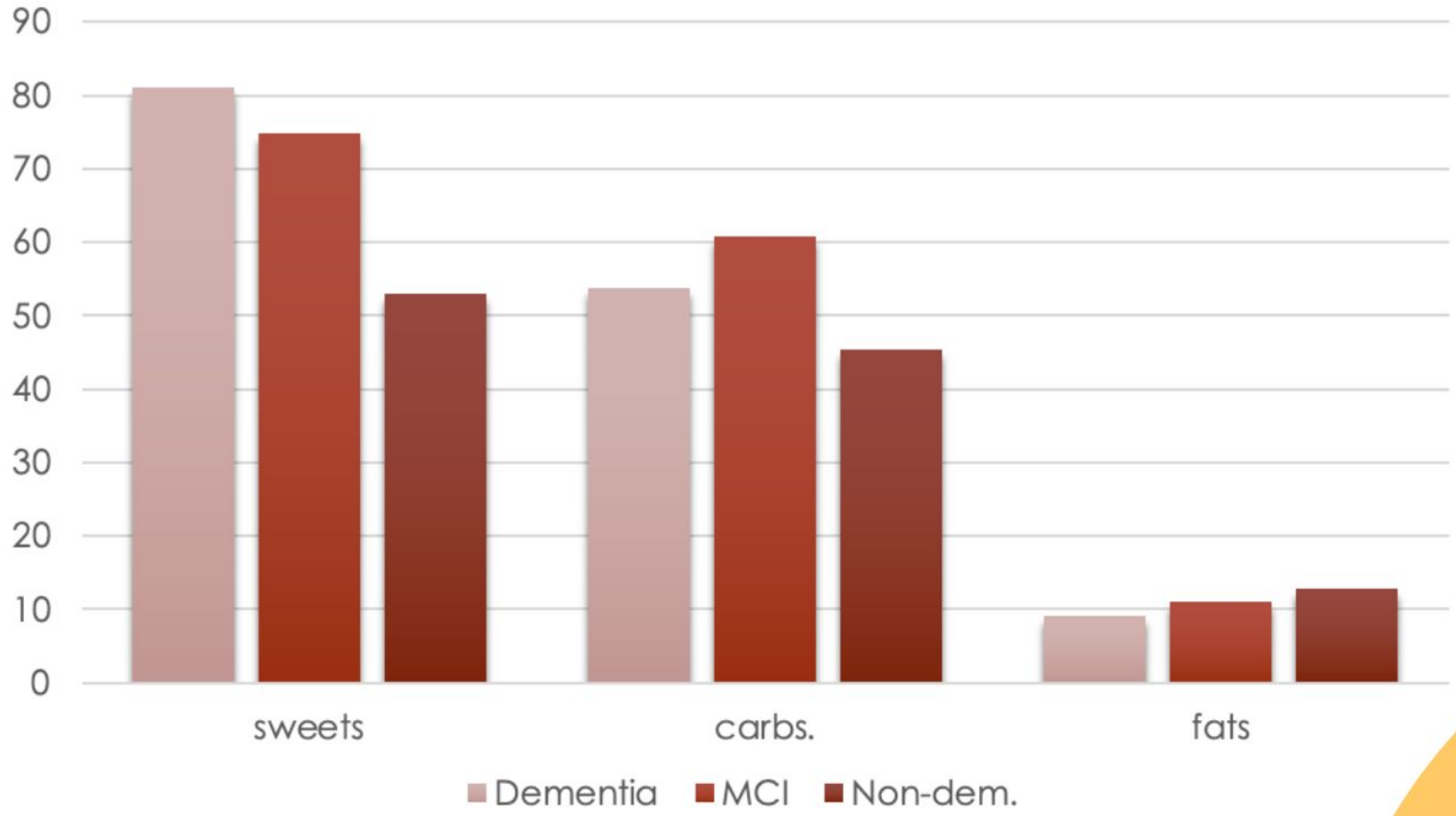
How does diabetes contribute to dementia?

- If you are insulin resistant, your body may not be able to break down the protein (amyloid) that forms brain plaques associated with brain disease.
- High blood sugar provokes the production of oxygen-containing molecules that damage cells and cause inflammation. This can result in the hardening and narrowing of arteries in the brain.
- This condition can lead to vascular dementia which occurs when blockages and strokes kill brain tissue.

Free Radicals & Oxidative Stress

- We know that oxidative stress is directly related to brain degeneration and cognitive decline.
- If you want to reduce oxidative stress and the action of free radicals from your brain, reduce the glycation of proteins. LIMIT your body's access to SUGAR.
- Refined sugars are the most dangerous, which are packed in virtually all processed foods. They are even hidden in "healthy" foods, especially *fat-free* foods

Sanders-Brown Study



Bad Sugar - Good Fat

- LDL's ("bad cholesterol") are an important carrier protein bringing vital cholesterol to brain cells.
- Problems arise when LDL's become oxidized.
- When LDL's become glycated (mixed with sugar), there is a dramatic increase in oxidation and a 50x increase in free radicals.
- Then, they cannot present cholesterol to brain cells and brain function suffers.

We Need Brain Fat

- Obesity and its metabolic consequences has almost nothing to do with dietary fat consumption and everything to do with our addiction to carbohydrates.
- Eating high cholesterol foods has no impact on our actual cholesterol levels.
- The alleged correlation between high cholesterol and higher cardiac risk is an absolute fallacy.

- Dr. Perlmutter

Fat Brain

- Good fats like Omega-3s and monosaturated fats reduce inflammation.
- Modified hydrogenated fats dramatically increase inflammation.
- In addition, certain vitamins (A, D, E, and K) require fat so they can absorb properly.
- These fat-soluble vitamins need dietary fat to transport them through the body.
- Because vitamins do not dissolve in water they can only be absorbed from your small intestine in combination with fat.

Protecting Your Brain

- DHA brain boosting molecule
- More than 2/3 of the dry weight of the human brain is fat. Of that fat, 1/4 is DHA.
- An important building block for the membrane surrounding brain cells, particularly the synapses.
- An important regulator of inflammation. It can fight back inflammation and it can block the damaging effects of a high sugar diet and help prevent metabolic dysfunction in the brain that can result from a high-carb diet.

Fish Oil & Antioxidant Protection

- Decreased levels of free radical damage in individuals who consume fish oil (the source of EPA and DHA)
- Omega-3 fats EPA and DHA produce powerful antioxidants and detoxification enzymes.
- Consuming more than 2 servings of fish/week was associated with a 59% reduction in the occurrence of Alzheimer's disease.

Increase Omega 3 Fatty Acids

Harvard Medical School Professor George Cahill -
recent studies have shown that coconut oil:

01

Improves antioxidant function

02

Increases the number of mitochondria

03

Stimulates the growth of new brain cells

04

Helps repair myelin sheath

Are all oils created equal?

01

Vegetable oil has omega-6 which is pro-inflammatory.

02

The recommended ratio of omega-6 to omega-3 is anywhere from 1:1 to 4:1.

03

The typical American diet averages are 20:1.

Casein

What is it?

Casein is the protein found in mammal's milk.

Casein Allergy

Allergy occurs when your body's immune system mistakenly thinks the protein is harmful and inappropriately produces allergic antibodies for protection.

Antibodies vs. Protein

The interaction triggers the release of body chemicals such as *histamine*.

Reactions could include:

Skin Reactions

Hives, rashes, red or itchy skin

Nasal

Congestion, runny nose, coughing, sneezing, wheezing, itchy or watery eyes

Swelling

In lips, tongue, mouth, face, or throat

Less Severe

Cramping, flatulence, nausea, diarrhea and/or constipation

Dairy Sensitivity

Allergy vs. Sensitivity

People can be sensitive to lactose without having a full-blown milk allergy.

60% of Americans

and 75% of individuals worldwide have recently been estimated to be lactose sensitive.

Foods Containing Casein

- Milk, Cream, Half & Half, Butter
- Salad dressings
- Whey
- Chocolate
- Sour Cream & Cheese
- Yogurt, Pudding, Custard
- Creamed soups & vegetables
- Soup bases
- Baby Formula
- Ice Cream & Sherbet

Milk Comparison

	2% Cow	Skim Cow	Unsweet Almond	Coconut	Rice
Calcium	30%	30%	45%	45%	30%
Vitamin A	9%	10%	10%	10%	30%
Vitamin D	26%	25%	25%	25%	25%
Fat	3g	0.1g	3g	5g	2.5g
Sugar	12g	12g	0g	0g	10g
Calories	122	83	40	50	120

What should we be eating?

Mediterranean? Dr. Mercola? Keto? Paleo? Atkins?

Refined sugar
& simple carbs

Gluten & dairy

Healthy fats

Dr. Mercola's Food Pyramid for Optimal Health

Grains and Sugars

- Minimal to no consumption
- Includes complex carbs such as bread, cereal, pasta, potatoes, corn, rice and grain products

Protein

- Grass-fed, organic meat and poultry
- Organic pastured eggs
- Safe fish such as wild Alaskan salmon
- Raw, organic dairy

Fruits

- Consume fruit in moderation
- Limit fructose to below 25 grams a day, including 15 grams from whole fruit

Healthful Fats & Veggies

- Healthy fats include coconuts, avocados, olive oil, butter, and raw nuts
- Raw, organic vegetables

Anti-inflammatory Foods

- Fermented foods
- Lightly steamed broccoli
- Oils with Omega-3 fatty acid
- Wild fatty fish (salmon, cod, sardines)
- Tart cherries
- Soaked walnuts
- Onions and garlic
- Pineapple
- Spinach
- Turmeric and ginger

Curcumin

- Curcumin (turmeric) and its impact on the brain is currently the subject of intense scientific inquiry.
- Has been used for thousands of years in traditional Chinese and Indian medicine.
- The prevalence of dementia is markedly reduced in communities where turmeric is used in abundance.

Low-Carb/High-Fat Diet

- Consuming fats, such as MCT oil or coconut oil, has been showed to impart significant improving cognitive functioning in Alzheimer's patients.
- A very low carb diet has been shown to reduce amyloids in the brain and increase glutathione (the body's natural brain protection).

Glutathione

- One of the most important detoxification agents in the human body.
    - Made up of 3 amino acids: glutamine, glycine, and cysteine.
- Serves as a major antioxidant - helping to protect the cell from free radical damage and protecting the mitochondria.
- Detoxification - renders various toxins less noxious and makes them more water soluble so they can be more easily excreted.
- To support Glutathione production, eat sulfur-rich foods, Vitamin C, and Selenium-rich foods.

Fermented Foods

- Fermented foods are foods that have been through a process of lactofermentation in which natural bacteria feed on the sugar and starch in the food creating lactic acid.
- This process preserves the food and creates beneficial enzymes, B-Vitamins, Omega-3 fatty acids, and various strains of probiotics.

How to Start

Start Slow

This is a marathon, not a sprint!

One at a time

Replace one thing at a time. Start with what he/she eats the most of.

Change Order

1. Food Type
2. Quality
3. Quantity
4. Refine

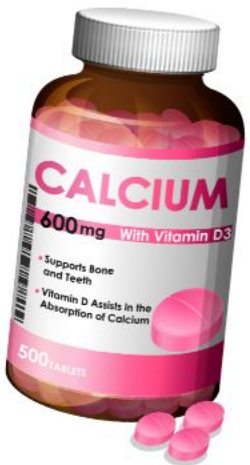
Tips

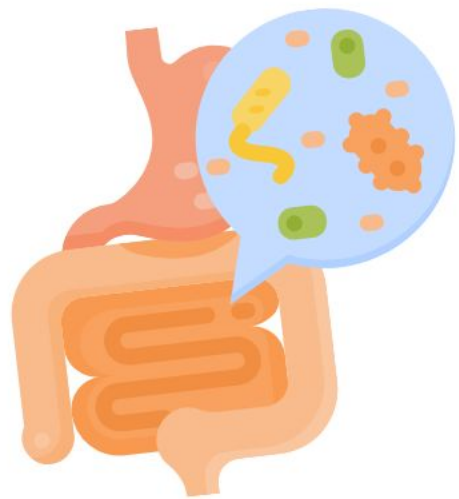
- You will likely notice that his/her diet expands as they detox.
- If necessary, first replace type of food, then increase the quality (organic, cleaner foods).
- Make same type of food as siblings, or put GF foods in the old food boxes.

When Foods Aren't Enough

Supplementing with:

- Antioxidants
- Probiotics
- Fish and/or MCT oil
- Multivitamin
- Glutathione
- Vitamins B, D, C, & E
- Digestive enzymes
- Calcium (if dairy-free)

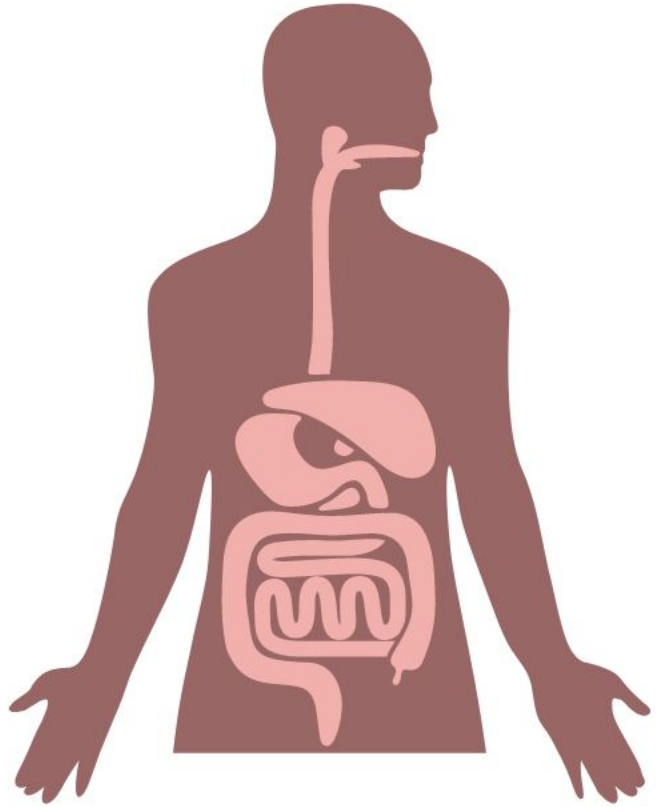




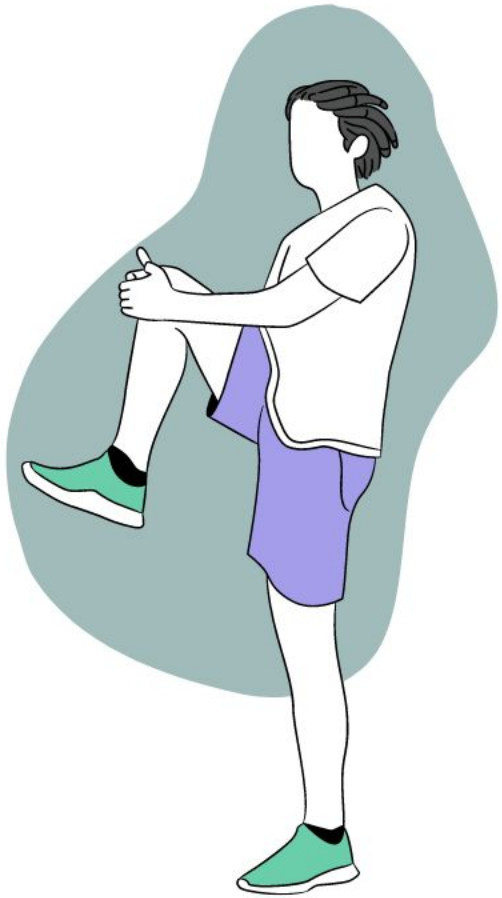
*Always consult your health-care provider.

Digestion and Detoxification

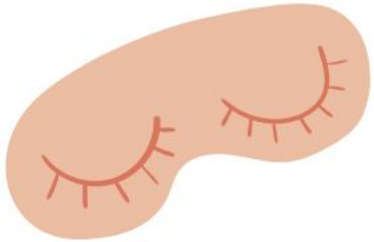
- Digestion releases the nutrients in food so the body can absorb them.
- Digestion starts in the mouth.
- Detox via bladder, bowels, and sweat.



Exercise

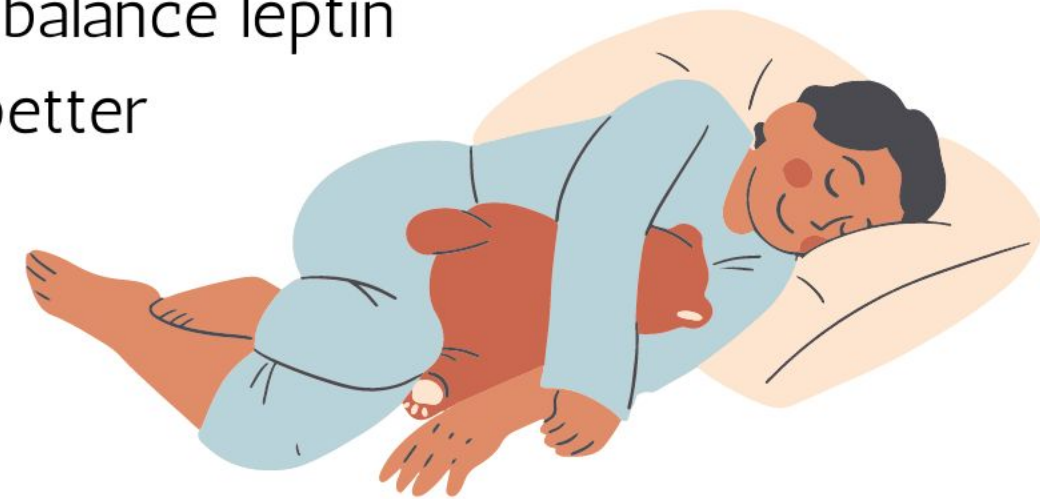


- Exercise is a potent anti-inflammatory and it improves insulin sensitivity.
- Dr. Aaron Buchanan (Rush University, Memory and Aging Project) found that the risk of Alzheimer's was nearly tripled in people who exert themselves the least.
- Daily 20 minutes moderately vigorous activity.



Sleep

- Sleep affects the hormone called leptin, a pro-inflammatory molecule. Sleep is negatively influenced by carbs with refined and processed sugars, causing even greater imbalance to leptin levels.
- Leptin also influences our cravings for carbohydrates.
- Healthy levels of leptin prevent most diseases of aging.
- No single drug or supplement can balance leptin levels; however, better sleep and better dietary choices can.
- Consider the incidence of sleep apnea in the DS population.



Take Away

- Impact of gluten and casein on health and increased sensitivities in DS population.
- Importance of processed sugar and healthy fats and the relationship to Alzheimer's disease.
- Can we reverse Autism or minimize the associated symptoms?
- Can we change the course of the "inevitable" Alzheimer's disease for our members?

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Let food be thy medicine and your kitchen be thy pharmacy

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