

The Down Syndrome Diet: Changing the 'Course' Through Nutrition


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Disclaimer



This presentation is intended to be informational and educational and 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 co-occurring issues for Individuals with DS

- 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

Autism **Vitamin A** Down syndrome

Autism **Vitamin D** Down syndrome

Autism **Selenium** Down syndrome

Autism **B12** Down syndrome

Autism **Zinc** Down syndrome

Autism **Glutathione** Down syndrome

Autism **Magnesium** Down Syndrome

Autism **Digestive Enzymes** Down syndrome



Deficiency Comparison

Autism

EPA

Autism

Taurine

Autism

Folate

Autism

Vitamin C

Autism

B6

Vitamin E

Down syndrome

Autism

Elevated antibodies to milk

Autism

Elevated antibodies to grains

Autism

Imbalance in bacterial flora in the gut



Autism and GF/CF Diet

- 45% of people with Autism Spectrum Disorders have gastrointestinal problems.
- Caregivers have been utilizing GF/CF diet for the past several years with 40% reporting a reduction in symptomatology and even 'recovering' children from Autism.
- 3-6% prevalence rate of Celiac Disease in the DS population.



What is Celiac Disease?

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

It is estimated to affect 1 in 100 people worldwide.

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

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 & 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 & 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 and Diet

- 2006 Mayo Clinic report – link between Cognitive impairment & Celiac Disease
 - Patients w/ sxs 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 and 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 & 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 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, french fries, sandwiches, juice, fruit punch

Adults: soda (diet or regular), fruit punch, potatoes, breads, breaded meats, pasta



Sugar Count



- ❑ AHA daily limit of sugar for children (based upon a 1,000-1,200 daily calorie intake) is 4 teaspoons (16 grams).
- ❑ However the Ave. child age 1-3 years consumes approx. 13 tsp. of added sugar/day.
- ❑ Ave. child age 4-8 years consumes approx. 21 teaspoons.
- ❑ Teenagers 14-18 years consume 34.3 teaspoons.
- ❑ The average adult consumes 22.2 teaspoons.



Sugar Content



- 12-oz can of soda = 39 grams
- 4 oz vanilla yogurt = 17 grams
- 8 oz applesauce = 36 grams
- 1 Poptart = 20 grams
- 5 oz package of fruit snacks = 10 grams
- 8 oz apple juice = 23 grams
- 8 oz Pediasure = 18 grams (chocolate = 23)



Sugar & Alzheimer's

- Becoming diabetic doubles your risk of Alzheimer's disease.
- Diabetes has tripled in the past 40 years.
- Half the people with diabetes will develop Alzheimer's disease (2011 study)
- Alzheimer's is now being considered Type 3 Diabetes.



How does diabetes contribute to dementia?

If you're insulin resistant, your body may not be able to break down the protein (amyloid) that forms brain plaques associated with brain disease.

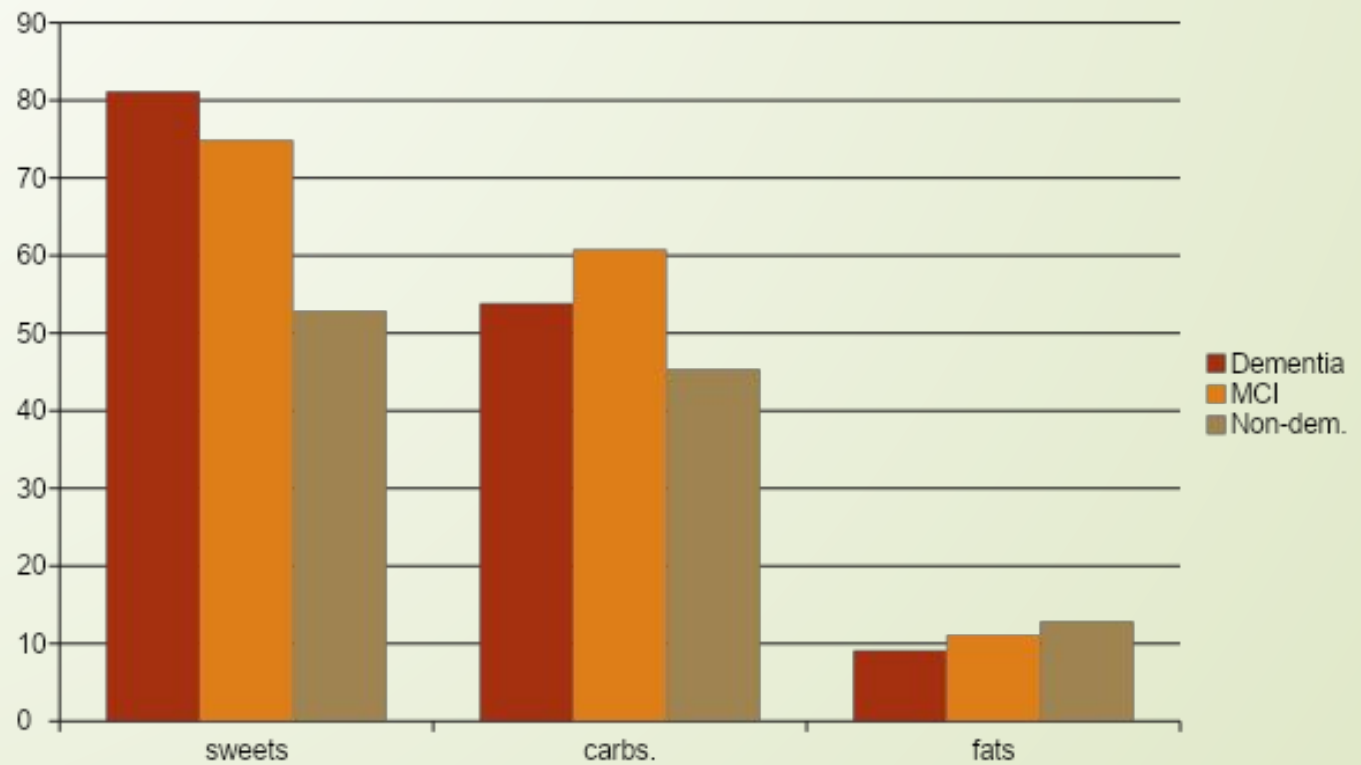
High blood sugar provokes the production of oxygen-containing molecules that damage cells and causes inflammation that can result in hardening and narrowing of the arteries in the brain. This condition can lead to vascular dementia, which occurs when blockages and strokes kill brain tissue.




Free Radicals & Oxidative Stress

- We know that oxidative stress is directly related to brain degeneration & cognitive decline.
- If you want to reduce oxidative stress and the action of free radicals from your brain, you have to reduce the glycation of proteins: You have to LIMIT your body's access to SUGAR.
- Most dangerous are refined sugars, which are packed in virtually all processed foods & hidden in “healthy” foods, especially *fat-free* foods.

Sanders-Brown Study





Bad Sugar – Good Fat

- ❑ LDLs (the so-called bad cholesterol) are an important carrier protein bringing vital cholesterol to brain cells.
- ❑ Problems arise when LDLs become oxidized.
- ❑ When LDLs become glycated (or mix 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 suffer.



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 be absorbed 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:

- * improves antioxidant function
 - * increases the number of mitochondria
 - * stimulates the growth of new brain cells
 - * helps repair myelin sheath
- 



Are All Oils Created Equal?

- ❑ Vegetable oil has omega 6 which is pro inflammatory.
- ❑ The recommended ratio of omega-6 to omega-3 is anywhere from 1:1 to 4:1
- ❑ The typical American diet averages are 20:1.




Casein

- Casein is the protein found in mammal's milk.
- A casein allergy occurs when your body's immune system mistakenly thinks the protein is harmful and inappropriately produces allergic antibodies for protection.
- The interaction between these antibodies and the specific protein triggers the release of body chemicals such as *histamine*.



Reactions could include:

- Skin reactions: hives, rashes, red or itchy skin
 - Nasal congestions, runny nose, coughing, sneezing, wheezing, itchy or watery eyes
 - Swelling of the lips, tongue, mouth, face or throat
 - Less severe reactions: cramping, flatulence, nausea, diarrhea and/or constipation
- 



Dairy Sensitivity

- People can be lactose sensitive without having a full blown milk allergy.
- Recent estimates indicate that approximately 60 % of Americans and 75% of people world-wide are lactose sensitive.



Foods that Contain Casein

- Milk, Cream, Half and Half, and Butter
- Yogurt, Puddings and Custards
- Sour Cream and Cheese
- Chocolate
- Baby Formula
- Ice Cream & Sherbet
- Soup Bases & salad dressings
- Whey
- Creamed Soups and Vegetables

Milk Comparison

	2% cow	Skim cow	Unsweet Almond	Coconut	Rice
Calcium	30%	30%	45%	45%	30%
Vitamin A	9%	10%	10%	10%	10%
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



So What Should We Be Eating?

Mediterranean?

Dr. Mercola?

Keto?

Paleo?

Atkins?

refined sugar & simple carbs
gluten & dairy
Healthy Fats



So What Should We Be Eating?



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

Nutrition is the first and most important key to health. I recommend focusing on eating whole, unprocessed foods while avoiding grains and sugars, which are precursors to disease.

Consume a diet primarily high in healthy fats like coconuts, avocados, olive oil, butter, and raw nuts like almonds (ideally between 50-75 percent in your diet) and raw, organic vegetables.

Next, consume good protein such as grass-fed, organic meats and organic pastured eggs. My current recommendation is one gram of protein for every kilogram of lean body mass, increasing it by 25% if you are pregnant or training for athletic events. This translates out to about 49-70 grams of protein a day for most people.

Eat fruits moderately because they contain fructose, which should be kept below 25 grams a day, including 15 grams from whole fruit.

Finally, reduce or eliminate grains from your diet to help lower your insulin and for you to better achieve optimal health and well-being.





Anti-Inflammatory Foods

Fermented foods

Lightly steamed broccoli

Oils with Omega-3 fatty acids

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 especially.
- Has been used for thousands of years and 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 shown to impart significant improving cognitive functioning in Alzheimer's patients.
- A very low carb. diet has been shown to reduce amyloids in the brain & 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 & 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!
- Replace one thing at a time- start with what he/she eats the most of.
- You will likely notice that he/she begins to expand their diet 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
- Change: Food Type --> Quality --> Quantity □ Refine



When Food May Not Be 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 & 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, which is a pro-inflammatory molecule & is negatively influenced by carbs with refined and processed carbs 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 & 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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