


Nutrition and Diet for Autism




Julie Matthews
Certified Nutrition Consultant
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Nutrition and Diet Agenda




- ✓ Underlying Biochemistry
- ✓ Nutrition
- ✓ Remove and Replenish
- ✓ Autism Diets
- ✓ Picky Eaters



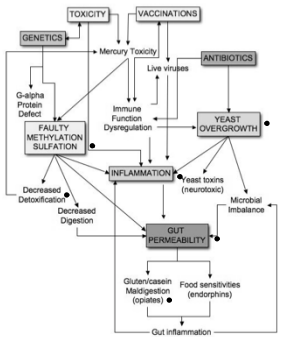
What is Autism and Autism Spectrum Disorder (ASD)?

Autism, PDD, Asperger's Syndrome, ADHD


- **Social:** Not playful, avoids eye contact
- **Communication:** Not use gestures, receptive and expressive language poor
- **Unusual interests and behaviors:** Repetitive actions, hand flapping, picky eating, "stimming"
- **Physical:** Constipation, diarrhea, hyperactivity, fatigue, aches and pains, digestive pain and gas, difficulty sleeping, anxiety




Autism: Whole Body Disorder




Brain is Downstream



- Yeast toxins
- Undermethylated neurotransmitters
- Brain inflammation
- Increased toxicity
- Nutrient deficiencies
- Opiates




Nutrition and Gene Expression

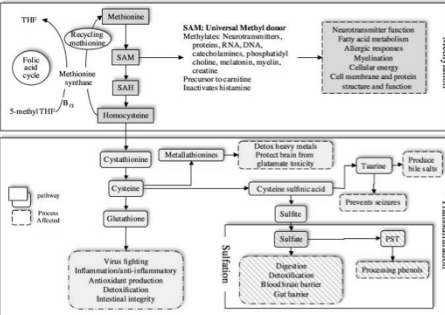



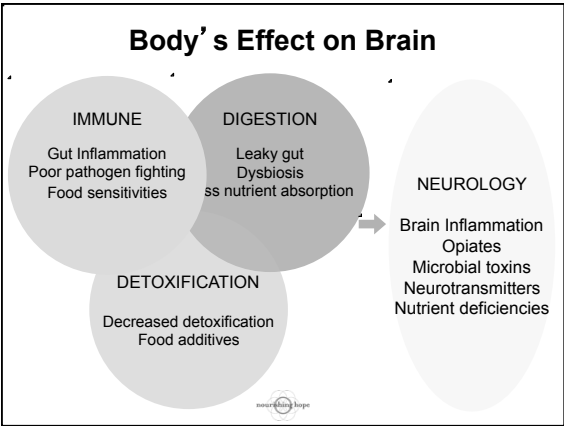
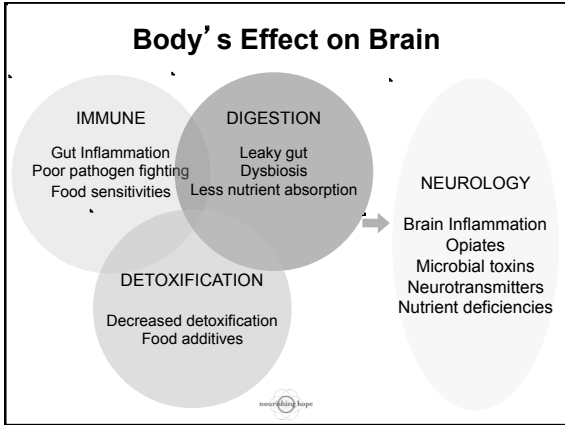
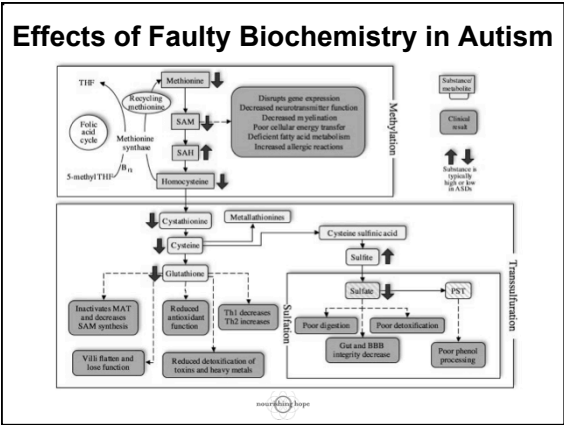
- Gene expression (Epigenetics)
 - Whether a gene is turned "on" or "off" (rather than changes to the DNA sequence) - regulated through **DNA methylation**
 - Nutrients can affect DNA methylation: zinc, methionine, betaine, choline, folate, B12
- Good nutrition during pregnancy and throughout life can change gene expression for the positive.
- Poor nutrition and toxins can affect it negatively
- Agouti mice study
 - "Methyl supplements increase the level of DNA methylation in the *agouti* LTR and change the phenotype of offspring in the healthy, longer-lived direction. This shows that methyl supplements have strong effects on DNA methylation and phenotype and are likely to affect long-term health."

Cooney CA, Dave AA, Wolff GL. Maternal Methyl Supplements in Mice Affect Epigenetic Variation and DNA Methylation of Offspring. *The American Society of Nutritional Sciences J Nutr.* 132:2393S-2400S, 2002



Biochemistry

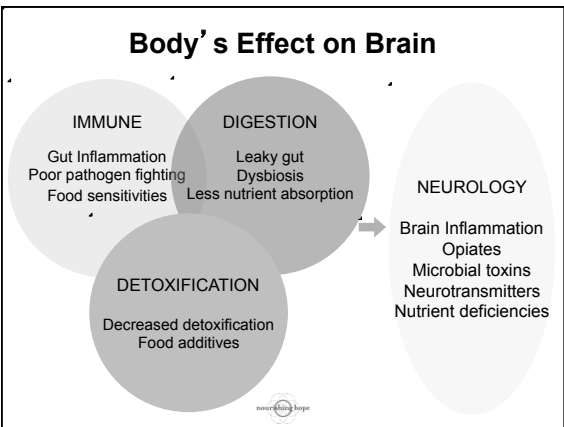



Poor Immune Function and Inflammation

- Immune fights viruses, bacteria and yeast. Weak system will cause more susceptibility to infection. Often more need for antibiotics. Possible difficulty in handling vaccinations?
- Inflammation related disorders like allergies and asthma have increased
- Inflammation of the brain affects autism

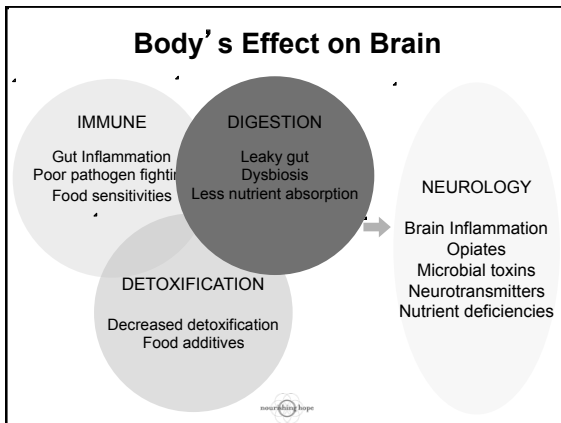
Decreased pathogenic fighting
Increased inflammation



Poor Detoxification

- Poor Detox more reaction & damage from toxins
- Harder time processing artificial ingredients (known to create hyperactivity in even NT children)
- More likely to be damaged by pesticides and heavy metals because of a reduced ability to detoxify them (known neurotoxins)

Important to avoid toxins for children with autism and ADHD



Poor Digestion

(Inability to digest & absorb necessary nutrients)

- Nutrients such as calcium and magnesium are needed for enzyme processes and brain function, as well as growth and repair
- Improper breakdown of proteins creates peptides (such as opiates to react to)
- Inadequate amino acids for creating neurotransmitters for attention, cognition, feelings of wellbeing

Importance of GI Health in Autism

"All disease begins in the gut"
- Hippocrates, the father of modern medicine

- Gut has constant contact with food
- Immune:
 - Physical barrier of defense against bacteria, viruses, etc.
 - Largest part of the immune system (70%) found in the gut
- Neurotransmitters:
 - The greatest amount (90%) of the "brain chemical" serotonin is found in the GI tract
 - Amino acids (absorbed from protein digestion) are precursors for neurotransmitters
- Full body function:
 - Vitamins/minerals absorbed in the gut are cofactors for enzyme reactions, metabolism, conversion of nutrients and fats

Nutrient Deficiencies in Autism

- Magnesium, calcium, zinc, selenium, iron
- Vitamin B6, B12, folic acid, B1, B2, B3, biotin
- Vitamin D and A
- Vitamin C
- Omega 3 fatty acids
- Amino acids: glutathione, cysteine, l-carnitine, taurine, and glycine

Deficiencies stem from...

- Insufficient digestion or absorption (inborn or acquired)
- Ability for the cell to utilize nutrient
- Not converted to active form
- Improper enzymes or nutrients needed for biochemical pathways (methylation, transulfuration, and sulfation)
- Increased toxins and inflammation - use up needed nutrients
- Intestinal dysbiosis and lack of beneficial bacteria
- Medication induced nutrient depletion
- Picky eating and poor quality food consumption
- Insufficient intake of macronutrients

How Diet Can Help - Support Digestion & Biochemistry

- **Leaky Gut and Gut Inflammation**
 - Remove foods that inflame gut
 - Add foods that reduce inflammation and heal the gut
 - Add foods that supply beneficial bacteria
- **Nutrient Deficiencies**
 - Increase the quality of food and digestibility
- **Yeast Overgrowth**
 - Remove sugars
 - Reduce refined flour products and starches
 - Add probiotic-rich foods
- **Toxicity and Poor Detoxification**
 - Avoid food additives
 - Avoid toxins in food supply and meal preparation
- **Faulty Methylation and Sulfation**
 - Remove phenolic foods
 - Improve methylation and sulfation through supplementation



Diet for Autism: What Parents Report

- Gastrointestinal problems relieved
- Diarrhea & constipation lessens
- Improved language skills and learning
- Greater focus and attention
- Reduced hyperactivity
- Eye contact
- More appropriate behavior
- Better sleeping
- Easier toilet training
- Skin rashes or eczema clear up

✓ **General Health & Happiness Improved**



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Healing Diets

1) **Remove:** Avoid offending foods and substances

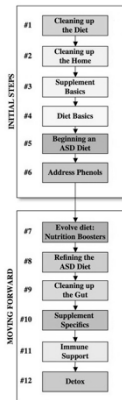
- Artificial additives
- Gluten, casein, soy, corn, phenols, oxalates, starches

2) **Replenish:** Increase healthy foods

- Whole and unprocessed foods (sweet potatoes not potato chips)
- Organic and locally grown
- Fermented foods: rich in probiotics
- Grass-fed/pastured meat and eggs
- Good fats

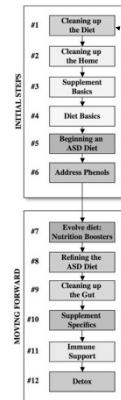
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Holistic Nutrition Approach



*from "Nourishing Hope for Autism"

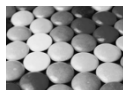
Holistic Nutrition Approach



STEP 1

*from "Nourishing Hope for Autism"

Food Additives Unhealthy Ingredients to Avoid



• **Food additives can cause:** Hyperactivity*, inattentiveness, aggression, irritability, headaches/pain, trigger asthma, can be addictive

Ingredients to Avoid	Sources
Artificial colors/flavors and preservatives	candy, cereal, "kids" foods
MSG (hydrolyzed protein, yeast extracts)	broth, bullion, soup, meat-flavored foods
Pesticides	non-organic produce and meat
Aspartame and other artificial sweeteners	sodas and other foods
High fructose corn syrup	sodas, jelly, candy
Trans fats	partially hydrogenated oil, commercial margarine, mayonnaise, peanut butter
Sodium nitrite	bacon, hotdogs, lunch meat

*McCann D, Barron A, Cooper A, Crumpler D, Dalen L, Grimshaw K, Kitchin E, Lok K, Porteous L, Prince E, Somogy-Barke E, Warner JO, Stevenson J. "Food additives and hyperactive behaviour in 3-year-old and 8.9-year-old children in the community: a randomised, double-blind, placebo-controlled trial." *Lancet*. 2007; Nov 3;370(9598):1560-7

Pesticides

- Suspected chronic effects from exposure to certain pesticides include birth defects, toxicity to a fetus, production of benign or malignant tumors, genetic changes, blood disorders, nerve disorders, endocrine disruption, and reproduction effects.
- The chronic toxicity of a pesticide is more difficult than acute toxicity to determine through laboratory analysis.



* Penn State: college of Agricultural Sciences



Pesticides

- 2010 study on ADHD, they found a 35 percent increase in the odds of developing ADHD with every 10-fold increase in urinary concentration of the pesticide residues. ^{1 2}
- 2007 study on autism, Women who lived within 500 meters, or 547 yards, of fields sprayed with organochlorine pesticides during their first trimester of pregnancy. Eight of them, or 28%, had children with autism. Their rate of autism was six times greater than for mothers who did not live near the fields. ³

1. Kizer, Sarah. Study: ADHD linked to pesticide exposure. CNN, 17 May 2010.
 2. Margit H. Thomas. "Study links pesticides to ADHD in children". The Los Angeles Times. <http://www.latimes.com/2010/may/17/la-he-0517-adhd17>
 3. Central Valley women lived within 300 meters, or 317 yards, of fields sprayed with organochlorine pesticides during their first trimester of pregnancy. Eight of them, or 28%, had children with autism. Their rate of autism was six times greater than for mothers who did not live near the fields, the study said.

Dirty Dozen

1. Celery
2. Peaches
3. Strawberries
4. Apples
5. Blueberries
6. Nectarines
7. Bell Peppers
8. Spinach
9. Cherries
10. Kale/Collard Greens
11. Potatoes
12. Grapes (Imported)

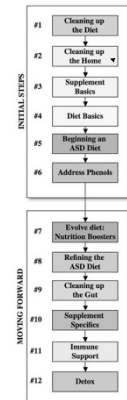


Sugar

- Feed yeast
- Depress the immune system
- Contribute to inflammation
- Cane sugar: common food sensitivity and uses chemical processing
- Refined sugar such as table sugar (white cane sugar) is devoid of nutrients/minerals that help process the sugar
- Refined sugar: "sugar" (bleached white cane sugar), Sugar in the Raw (white sugar with molasses added back), agave nectar
- Natural, less-refined sugar (more minerals and less refinement): Raw honey, Maple syrup (grade B), sucanat, fruit, blackstrap molasses,
- 4-5 grams per serving (1 teaspoon "sugars") = 2 oz fruit juice, 2 tsp dried fruit, 1 TBSP ketchup



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STEP 2

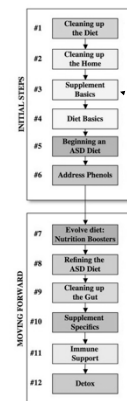
*from "Nourishing Hope for Autism"

Common Household Toxins

- It is not only important to remove chemicals in the food we eat, but also in our home and environment
- Fragrance and perfume
- Flame retardant in car seats & clothing
- Fabric softener
- Chemical cleaners - use baking soda and vinegar when possible
- Sunscreens (nano and chemical)
- Toothpaste
- Flea treatments and ant sprays



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STEP 3

*from "Nourishing Hope for Autism"



Supplement Basics

- B6 - pyridoxine or P5P
- B12 - methylcobalamin
- Folate - Folinic or 5-MTHF
- Magnesium
- Calcium
- Probiotics
- Enzymes (Houston Enzymes and Klaire)

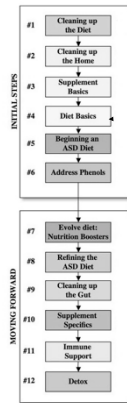


Supplements

- Calcium, 800-1200 mg per day
 - Especially important on casein-free diet
- Multivitamin/mineral formula including
 - Zinc
 - Magnesium
 - B6
 - Folic acid
- Digestive enzymes
- Probiotics
- Cod liver oil/Fish oil



Holistic Nutrition Approach



*from "Nourishing Hope for Autism"

Fats

Omega 3	Omega 6	Monounsaturated	Saturated Fat
Fish oil or cod liver oil	Borage oil (GLA) Evening primrose oil (GLA)	Olive oil Avocado	Coconut oil Palm/Red Palm oil
Flax seed oil	Black currant oil (GLA)	Nuts/seeds	Animal fats – ghee/dairy, lard, bacon
DHA and EPA supplements	Hemp seeds/oil (GLA) Nuts/seeds and oils		

• AVOID Vegetable oil: canola, safflower, corn, soy, and cottonseed oils

- Brain development and brain function
- Hormone balance and mood
- Omega 3s (very helpful with depression, hyperactivity, and inflammation)
- Formation/fluidity of cell membrane
- Creating energy in cell and helps burns fat

Saturated Fat and Cholesterol

Vital Roles of Saturated Fat

- ✓ **Brain**—Saturated fats important brain development
- ✓ **Bones** – Saturated fats help body put calcium in bones
- ✓ **Liver** – Saturated fats protect the liver from poisons
- ✓ **Lungs** – Can't function without saturated fats—protects against asthma
- ✓ **Immune System** – Enhanced by saturated fats—fights infection
- ✓ **Essential Fatty Acids** – Work together with saturated fats



Coconut Oil:

- Contains many antifungal and antiviral components
- Anti-inflammatory effects
- More easily digested and absorbed
- Used immediately to create energy
- Enhances absorption of minerals

Uses for Cholesterol

- Brain development and function
- Aids digestion
- Builds strong bones and muscles, repairs damaged tissue
- Building block for hormones
- Regulates your blood sugar
- Protects against infectious diseases



Studying Cholesterol

• Cholesterol is not enemy we hear it is

- Dr. Harlan Krumholz, Cardio. Med at Yale found **old people with low cholesterol died twice as often** from a heart attack as old people with high cholesterol. 1

Artery damage -

- From food containing oxidized fat and oxidized cholesterol
- Oxidized cholesterol**
 - Oxidized cholesterol shown to be atherogenic in studies.2
 - Powdered milk, dried egg products, dried meat, cheeses, protein powder
 - Processed foods containing them: cake and bread mixes, crackers
 - Low fat and nonfat milk containing milk solids

Dietary Intervention

- ✓ Consume/don't avoid cholesterol in natural foods like eggs, meat, butter/ghee.
- ✓ Increase fiber to bind cholesterol and keep it in check
- ✓ Avoid consumption of oxidized cholesterol foods - processed/powdered foods
- ✓ Increase antioxidants in the diet
- ✓ Avoid oxidizing fats - avoid high heat cooking of unsaturated fat

1. Krumholz HM and others. Lack of association between cholesterol and coronary heart disease mortality and morbidity and all-cause mortality in persons older than 70 years. *Journal of the American Medical Association* 272: 1335-1340, 1994.

2. Hubbard RW, Cho Y, Sanchez A. Atherogenic effect of oxidized products of cholesterol. *Prog Food Nutr Sci*. 1989;13(1):17-44.



Protein

- Protein (essential amino acids) building blocks for:
 - Muscle and tissue growth and repair, neurotransmitters, immune responses, enzymes, detoxification
- Often need to focus on getting more in diet
- Bio individuality - amounts vary.
 - Some kids need more, some children cannot process protein well: High ammonia, low HCl, low zinc, B6, or iron

Signs of protein deficiency:

Stunted growth, lack of appetite, edema, suppressed immune system, muscle wasting, anxiety, sparse hair, dry skin



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Grass-fed/Pastured Animal Protein/Fats

Grass-fed/pastured

Commercial

- | | |
|--|--|
| <ul style="list-style-type: none"> • Higher omega 3 (2-4x more, eggs 10x more*) • Rich in DHA (brain development) • Rich in Vitamin A, D, E, K <ul style="list-style-type: none"> – 4x the vitamin E* – 2x the vitamin A • Higher in CLA • Higher in Tryptophan (sleep and mood) | <ul style="list-style-type: none"> • Unhealthy animals-poor food • Inflammatory grains-create inflammatory food • Low Vitamins A&D and others • Higher in fats & cholesterol-particularly bad fats • Higher in arachidonic acid (inflammatory) • Low in anti-inflammatory fats |
|--|--|

--Organic is not necessarily grass-fed

WestonAPrice.org

* Lopez-Bote, C. J., R.Sanz Arias, A.I. Rey, A. Castano, B. Isabel, J. Thos (1998). "Effect of free-range feeding on omega-3 fatty acids and alpha-tocopherol content and oxidative stability of eggs." Animal Feed Science and Technology 72: 33-40.

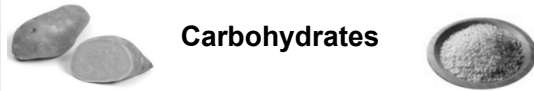
Plant-Based Protein

- Helpful with high ammonia or when animal protein is not allowed
- Beans and lentils
 - SCD compliant: lentils, navy beans, kidney beans, black beans, split peas
- Nuts/seeds
- Quinoa: contains 50% more protein than other grains
- Combine beans, nuts, and grains daily to complete essential amino acids
- Spirulina
- Protein powder: Rice, pea, or hemp
- Avoid: soy



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Carbohydrates



- Carbohydrates provide energy
- Carbohydrates are important - and quality is essential. Most autism diets (exception is seizure diets) are not low carbohydrate.
- **Add complex carbohydrates:** vegetables, fresh fruit, whole grains, starchy vegetables
- **Reduce refined carbohydrates:** flour products (bread, crackers, chips), cookies, pasta and **reduce sugar**
 - Feed yeast overgrowth and other microbial imbalance
 - Contribute to blood sugar imbalances
 - Can cause spikes and crashes in energy - contributing to fatigue and poor cognitive performance

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Top Nutrition Boosters

- Vegetables
- Juicing
- Fermentations
- Grass-fed meat
- Broth and stock



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Vegetables & Nutrient-Dense Foods



- **Vitamin B6:** Sunflower seeds, pistachios, walnuts, lentils, grains and beans, rice bran, blackstrap molasses
- **Vitamin B12:** Liver, eggs, fish, lamb, beef
- **Zinc:** Pumpkin seeds, nuts, legumes, ginger, oats
- **Magnesium:** Sweet potato, winter squash, broccoli, leafy greens, seaweed, nettles, whole grains, nuts, legumes
- **Calcium:** Broccoli, leafy greens, winter squash, seaweed, nettles, nuts
- **Folic acid:** beans, rice germ, liver, asparagus
- **Vitamin A & D:** Liver, egg yolk, butter/ghee, cod liver oil, dairy fat
- **Vitamin C:** Sweet potato, winter squash, broccoli, leafy greens
- **Omega 3:** Fish/cod liver oil, beef and lamb, egg yolk, butter/ghee, flax seeds, hemp seeds, walnuts, algae-based DHA (neuromins supplement)
- **Iron:** blackstrap molasses, liver, pumpkin seeds, duck egg



Juicing

- Stored and pasteurized juices contain significantly less nutrients: zinc, iron, calcium, vitamins B1, B5, and B6
- Fresh and raw vegetable juice contain many times more vitamins & phytonutrients than bottled
- Higher concentration of nutrients
 - Chlorophyll and phytonutrients
- Get nutrients without needing to eat/chew vegetables
- Children that like liquids, juices and smoothies



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Juicing Ideas

Start with (base juice)	Flavor boosters	Nutrient dense vegetables
•Cucumber	•Carrot	•Parsley, cilantro
•Celery	•Beet	•Kale or other greens
•Lettuce	•Fruit: Apple, pear	•Cabbage
•Broccoli stalk	•Jicama	•Ginger

Preparation tip

- Juice fresh fruit for taking supplements vs. bottled
- Add supplements to vegetable juice (instead of fruit juices)
- Add vegetable juice to smoothies.

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Soaking “Seeds” – Easy to do

Grains, nuts, seeds, beans

- Increases digestibility
- Reduces inflammatory response
- Breaks down phytic acid and oxalates
- Fermenting grains breaks down lectins

Grains - Soak in water for 8-24 hours with 2 TBSP lemon juice or vinegar. Drain and cook with fresh water.

Nuts - Soak in water (with or w/o salt) for 7-12 hours. Drain and refrigerate, use to make nut milk, or drain and dehydrate (eat or make nut butter)

Beans - Soak in water for 8-24 hours with hearty pinch of baking soda. Drain and cook with fresh water.

Preparation tip

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Fermented Foods – Rich in Probiotics

Functions of good bacteria

- Regulate peristalsis and bowel movements
- Break down bacterial toxins
- Make vitamins needed and utilize: B1, B2, B3, B5, B6, B12, A and K
- Digest protein into amino acids (for use by the body)
- Produce antibiotics and antifungals
- Help breakdown sugars, lactose, and oxalates
- Support immune system and increase number of immune cells
- Balance intestinal pH
- Protect against environmental toxins: mercury, pesticides, pollution



Raw fermented foods contain billions (even trillions) of bacteria/serving!



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Fermented Foods – Rich in Probiotics

Dairy-free:

- Raw sauerkraut/Cultured vegetables
- Nut milk yogurt
- Beverages (contain yeast that kills candida):
 - Kombucha
 - Young coconut kefir
 - “Sodas” (hibiscus/rosehip tea with kefir starter)



Dairy: Milk-based yogurt/kefir



Bacterial ferments (Lactobacillus) **Yeast and Bacteria ferments**

- Cultured vegetables
- Yogurts
- Kefirs
- Kombucha



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Nutrient-dense Animal Foods

- **Eggs, from pastured hens** (if not sensitive): B12, vitamin A, B-vitamins, vitamin D, vitamin E, selenium, calcium, iodine, zinc, iron, choline
- **Animal protein and fats** (grass-fed/pastured): Vitamins A, D, E, and K, DHA, tryptophan
- **Organic liver:** iron, vitamin C, B12, folic acid, vitamin A



Preparation tip

Use pastured/grass fed eggs, meat, and dairy (if consumed)

- Puree cooked meat (chicken breast) into pancakes
- Puree liver and add small amount to meatballs or meat patties
- Use ghee (or raw butter if tolerated)
- Add high quality eggs to pancakes, soft-boiled yolk to mashed banana/avocado, soak GF bread in egg for French toast




Homemade Bone & Vegetable Broths



Nutrient dense, easy to assimilate nutrients
– trace minerals, amino acids, calcium, magnesium, potassium, iron

Bone Broths	Vegetable Broths
Grass-fed/pastured chickens or beef bones	Vegetables, Root vegetable peels
Add 2 Tablespoons of vinegar - increases the calcium & magnesium	Seaweed
Contains gelatin for digestion and joints	Greens & nettles

Preparation tip Prepare soups, stews, casseroles with stock
Cook grains, soups, and/or pasta in broths - nutrients will absorb into food

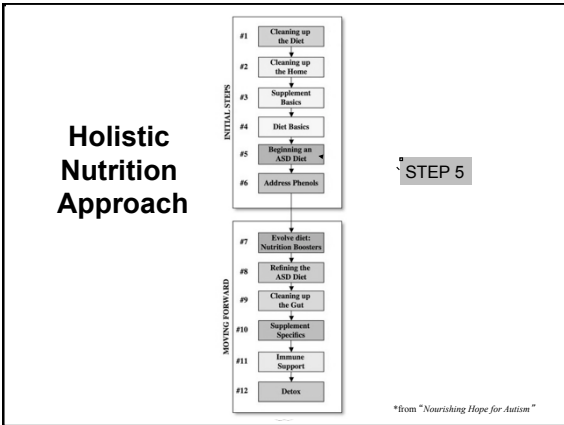


Water and Salt

- Purified Water
 - Avoid tap water, fluoridated and chlorinated water
 - Get a water filter. Avoid bottled water (plastic and transportation).
- Nutritive Salt
 - Salt cravings can be a sign of nutrient deficiencies
 - Avoid stripped white “table salt” - may contain aluminum
 - Choose nutritive salt with trace minerals (including natural iodine*)
 - Celtic Sea Salt or Himalayan crystal salt

*Additional iodine can also be obtained in the diet through kelp or multivitamin/mineral supplementation



Top Diets

Diets

<p>GFCF (Gluten-free and Casein-free) No gluten (wheat, rye, barley, spelt, kamut, and oats) or casein (dairy)</p> <p>Food Sensitivity Elimination and Rotation Eliminating all other food sensitivities: Soy, corn, eggs, citrus, peanuts, chocolate, cane sugar</p> <p>Feingold Diet Restricts high phenolic foods, including all artificial ingredients and high salicylate fruits</p> <p>FAILSAFE Diet Restricts high phenolic foods, including all artificial ingredients and high salicylate fruits</p> <p>SCD (Specific Carbohydrate Diet)/GAPS Restricts carbohydrates to only fruits, non-starchy vegetables, and honey. No grains, starchy vegetables, or mucilaginous fiber</p> <p>Weston A Price Dietary Principles: Solid nutrition foundation for everyone</p>	<p>Low Oxalate Diet Restricts high oxalate foods (nuts, beans, greens)</p> <p>Body Ecology Diet Anti-yeast diet combining principles of anti-yeast diets including no sugar, acid/alkaline, fermented foods</p> <p>Low FODMAPS Diet Low in fermentable, poorly absorbed carbohydrates such as fructose, lactose and FOS.</p> <p>GenoType/Blood Type Diet Foods customized based on blood type and genetics</p> <p>Paleo/Primal Blueprint Meat, fruit, vegetables, fat and nuts. No grains or beans. Often removes potatoes and dairy too.</p>
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Natural Food Compounds

Compound	Sources
Salicylates	Grapes, raisins, apples, berries, almonds, honey, curry, spices
Amines	Cheese, chocolate, bananas, wine, fermented foods
Oxalates	Nuts, beans, grains, buckwheat, spinach, beets, citrus peel, leafy greens
Lectins & phytates	Grains, beans, soy, peanuts, dairy, nightshades (tomatoes, potatoes, peppers). Lectins, part of blood type diet.
Glutamates	Soy sauce, parmesan cheese, broths, vegemite, gelatin, corn, peas, tomatoes
Sugars and starches	Grains, beans, lactose, FOS, fructose

Gluten-Free/Casein-Free: GFCF & Other Food Sensitivities



Food Allergies & Sensitivities

- Food allergies (IgE): immediate/acute
 - Hives, anaphylactic shock
 - Peanuts, eggs*
- Food Sensitivities (IgG): delayed
 - Digestive disturbances, inflammation, pain, hyperactivity, anxiety
 - Gluten, casein, soy, corn*

*Any food can be an allergy or a sensitivity



Common Food Sensitivities Eliminate or Rotation Diet

- Gluten
- Casein
- Soy
- Corn
- Eggs
- Citrus
- Peanuts and



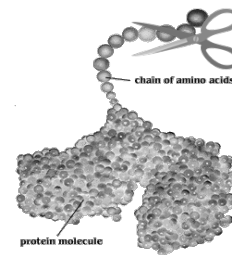
Gluten and Casein

- Common IgG reactions in autism
- Possible opiate response
- Inflammatory response
- Autoimmune response
- Other possible reactions
- Trying the diet is the “gold standard” of how a child reacts to gluten and casein

= *Try the diet*



Digestion Breaks Proteins into Amino Acids



- When someone is unable to break gluten or casein proteins down into individual amino acids, they remain as protein chains or opioids

Healthy Gut and Enzymes

- When proteins are properly broken down by enzymes, these amino acids are used as building blocks for enzymes, neurotransmitters, etc.
- These amino acids absorb through the gut and are utilized by the body
- In a healthy gut, large peptide chains are too large to be absorbed and will not cross into the blood stream
- Nutrients absorb, peptides and toxins do not



Digestive Enzymes

- Diminished brush border enzymes in children with autism
- DPPiV - breaks down gluten and casein opioid activity
 - DPPiV damaged by organophosphates and certain heavy metals like mercury



Unhealthy Gut and Opioids

- When there are not sufficient enzymes to break down proteins, the amino acids needed for neurotransmitter function (brain function), as well as all other functions will not be available
- If the gut is inflamed and "leaky" peptides will remain and leak into the blood stream. This can create an immune system reaction of inflammation or opiate response
- Act as a neurotransmitter (opioid)
 - Gluten peptide is gliucomorphin (Tyr-Pro-Gln-Pro-Gln-Pro-Phe)
 - Casein peptide is casomorphin (Tyr-Pro-Phe-Pro-Gly-Pro-Ile)
 - Different than human milk casomorphin (Tyr-Pro-Phe-Val-Glu-Pro-Ile)
- Opioids residues can be measured in breast milk, blood, urine, and cerebrospinal fluid



Opioid Peptides can cause...

- ❖ Addiction (foods)
- ❖ Hallucinations
- ❖ High pain tolerance
- ❖ Inattention and spacey behavior
- ❖ Aggression (self and others)
- ❖ Stimming
- ❖ Mood changes
- ❖ Poor eye contact



Why the GFCF Diet Works

- Elimination of opiate peptides
- Reduction of inflammatory compounds
- Reduction of IgG antibodies
- Removal of foods that cause inflammation in the gut and contribute to leaky gut
- Removal of processed wheat and dairy foods that often contain propionate (MacFabe)



Scientific Rationale for Diets

- Research on gluten and casein for **AUTISM**
 - OPIOIDS**
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 - Shatash P, Whitley P. (2002) Biochemical aspects in autism spectrum disorders: updating the opioid-excess theory and presenting new opportunities for biomedical intervention. *Expert Opin Ther Targets*. Apr;6(2):175-83
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 - Krivisberg AM, Reichelt KL, Nodland M. (2001) Reports on dietary intervention in autistic disorders. *Nutritional Neuroscience*. 4(1):25-37.
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Special Article

Celiac Disease Presenting as Autism

Stephen J. Genuis, MD, FRCS, DABOG, DABEM, FAEM, and Thomas P. Bouchard, BSc

Gluten-restricted diets have become increasingly popular among parents seeking treatment for children diagnosed with autism. Some of the reported response to celiac diets in children with autism may be related to amelioration of nutritional deficiency resulting from undiagnosed gluten sensitivity and consequent malabsorption. A case is presented of a 5-year-old boy diagnosed with severe autism at a specialty clinic for autistic spectrum disorders. After initial investigation suggested underlying celiac disease and varied nutrient deficiencies, a gluten-free diet was instituted along with dietary and supplemental measures to secure nutritional sufficiency.

The patient's gastrointestinal symptoms rapidly resolved, and signs and symptoms suggestive of autism progressively abated. This case is an example of a common malabsorption syndrome associated with central nervous system dysfunction and suggests that in some contexts, nutritional deficiency may be a determinant of developmental delay. It is recommended that all children with neurodevelopmental problems be assessed for nutritional deficiency and malabsorption syndromes.

Keywords: autism; autistic spectrum disorder; gluten sensitivity; celiac disease; nutrition; malabsorption

In a seminal paper published in 1943 titled "Autistic Disturbances of Affective Contact," Leo Kanner first described a series of children with the neuropsychiatric condition currently known as autism.¹ According to the latest revision of the *Diagnostic and Statistical Manual of Mental Disorders* (fourth Edition, Text Revision),² autism is a disorder of impaired social interaction and communication, limited activities and interests, as well as stereotyped behaviors—difficulties that are usually evident by 3 years of age. Concomitant with isolative behavior, children with autistic disorders frequently manifest

celiac disease and assorted nutritional deficiencies were addressed.

Over the past few decades, autism has been recognized as the most severe form of affliction in a spectrum of pervasive developmental disorders referred to as autistic spectrum disorders. Population-based studies in America and the United Kingdom have demonstrated that the prevalence of autism is increasing significantly and that this disorder has become a serious public health issue.^{3,4} From an incidence as low as 1:2500 in the mid-1980s, the reported rate of autism rose to about 1:300 in 1996⁵ and

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Gluten Grains & Ingredients to Avoid

Grains

Wheat
Rye
Barley
Spelt
Kamut
Triticale
Oats (commercial)
Semolina



Hidden Sources

Hydrolyzed Vegetable Proteins
MSG
Dextrin
Malt
Citric acid
Artificial flavors & coloring
"Spices"
Soy sauce (unless wheat-free)
Potato chips/fries



Gluten-Free Grains and Foods

Rice	Sorghum	Thickeners
Millet	Tapioca	Agar
Quinoa	Nut flours	Guar gum
Amaranth	Seed flours	Gelatin
Buckwheat	Coconut flour	Kudzu powder
Corn	Chestnut flour	Tapioca
Wild rice	Bean flours	Sweet rice flour
Montina	Roots (taro, yam)	Xanthan gum
Teff	Yucca/casava	Arrowroot



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Casein Containing Foods to Avoid

Milk	Whey
Cheese (all)	Galactose
Yogurt	Casein, Caseinate
Butter	Lactose, Lactalbumin
Buttermilk	Lactic acid
Ice cream	Sherbet
Kefir	Canned tuna
Cream	Cool whip
Sour cream	Artificial butter flavor



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Casein-Free Foods



Milk & Yogurts	Oil/Butter	Ice Cream
Rice milk	Coconut oil	Sorbets w/o milk
Almond, hazelnut or hemp milk	Ghee	Non-dairy ice cream
Homemade Nut milk	Lard or tallow	Coconut ice cream (Coconut Bliss)
Coconut milk	Earth Balance	Fruit popsicles
Potato milk	Kosher items	Chocolate
(Vance's DariFree)	Pareve only	GFCF chocolate
Soy milk (if not soy-free diet)	Cheeses	
	(Galaxy Foods)	

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Other Food Sensitivities

- Soy
- Corn
- Eggs
- Citrus
- Peanuts
- Nuts

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Avoid Soy

- Not good substitute for dairy or protein
- Very difficult to digest
- Irritate the gastrointestinal tract
- Blocks absorption - calcium, magnesium, iron, copper and especially zinc - due to phytic acid and oxalates
- Blocks thyroid function
- Endocrine disruption in the reproductive hormones of both males and females



Soy sources: tofu, soy protein, miso, tempeh, soy milk, soy cheese or ice cream, soy sauce, tamari, soy oil

Hidden soy: lecithin, vitamin E



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Avoid Corn



- Top 5 allergen
- Contains high level of fungus
- Herbicide Atrazine delays puberty in boys, affect endocrine function, fertility and thyroid
- Genetically modified corn: environmental experiment, RoundUp Ready. Genes from bacteria toxin added - BT toxin
- Eat ONLY organic, if at all



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Beyond GFCF

- Soy-free
- Corn-free
- Specific Carbohydrate Diet
- Food additives
- Feingold Diet
- Dysbiosis - Adding probiotic/fermented foods, Body Ecology Diet
- Low Oxalate Diet

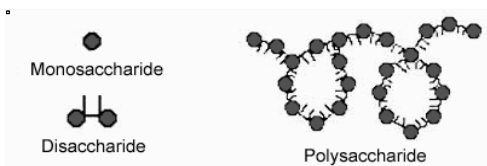


Specific Carbohydrate Diet (SCD)



Specific Carbohydrate Diet™

- Removes disaccharides and polysaccharides (most sugars & starches)
- Allows only monosaccharides (honey, fruit, non-starchy vegetables)



SCD Specifics

Begin SCD casein-free
Consider the SCD Intro diet

Foods to avoid on SCD	Foods to eat
✓ No grains or corn	<input type="checkbox"/> Vegetables (non-starchy)
✓ No potatoes (white or sweet)	<input type="checkbox"/> Fruit
✓ No soy products	<input type="checkbox"/> Fruit juice not from concentrate
✓ No sugars except honey	<input type="checkbox"/> Honey
✓ No cornstarch, arrowroot powder, tapioca, agar-agar or carrageenan	<input type="checkbox"/> Meat
✓ No pectin in jams	<input type="checkbox"/> Eggs (if tolerated)
✓ No chocolate or carob	<input type="checkbox"/> Nuts/seeds and nut milks (if tolerated)
✓ No baking powder (baking soda OK)	<input type="checkbox"/> Certain beans
	<input type="checkbox"/> Ghee



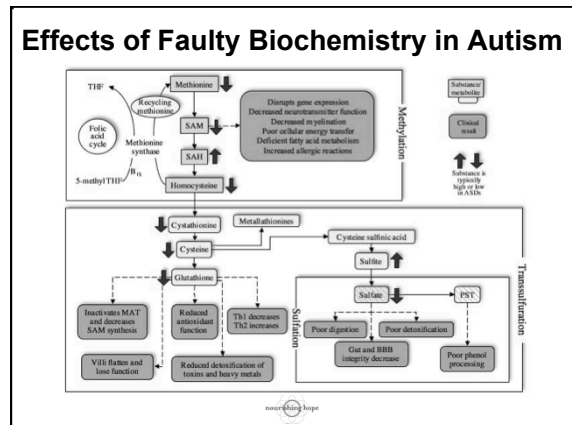
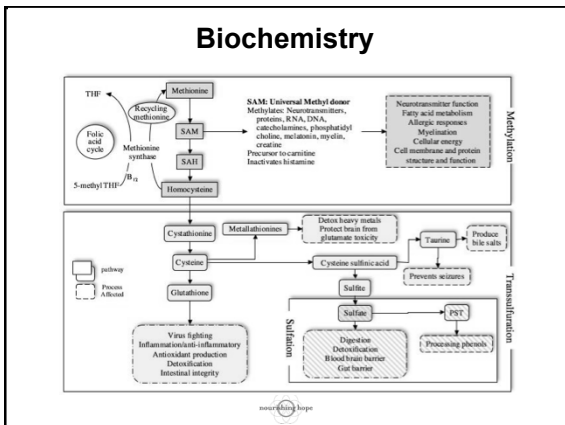
SCD Intro Diet

- Helpful but not essential if diet is too restrictive for certain children
- Intro: Broths, meat, eggs, cooked carrots, gelatin
- Stages: Not exact science (PecanBread.com)
 - Easiest to digest foods
 - Start with cooked vegetables and fruit
 - Avoid whole nuts, seeds, beans, dried fruit, meat jerky and fried foods
 - Avoid large amounts of high oxalate foods like nut milks and nut butters



Phenols & Salicylates Feingold Diet and Failsafe Diet





- ### Phenols/Salicylates on Feingold
- Almonds
 - Apples
 - Apricots
 - Berries, raspberries, cherries
 - Chili powder
 - Cider and cider vinegar
 - Cloves
 - Coffee
 - Cola drinks
 - Cucumbers and pickles
 - Curry powder
 - Endive
 - Grapes, raisins, currants
 - Honey
 - Nectarines and peaches
 - Oranges and oranges
 - Paprika
 - Peppers (bell and chili)
 - Pineapple
 - Plums and prunes
 - Radishes
 - Tea
 - Tomatoes
 - Wine and wine vinegar
 - Oil of wintergreen

Body Ecology Diet

- Low sugar diet
Fermented foods
- ### Body Ecology Diet
- Food combining
Acid/alkaline
Expanding/contracting
- Low sugar:** Avoids all sugars including fruit. Only sour fruit allowed at the beginning: Lemons, limes, black currants, cranberries. Future: Grapefruit, kiwi, and green apples.
 - Addition of fermented foods:** Young coconut kefir, raw sauerkraut/cultured vegetables
 - Expansion/Contraction-** macrobiotic principle of energetic properties of food. Contracting: meat, eggs, salt. Expanding: sugar.
 - Acid/Alkaline-** The intention is to keep the blood slightly alkaline. This is thought to discourage the growth of systemic candida.
 - 20% acid-forming foods: meat, grains, eggs, and 80% alkaline-forming foods: vegetables, raw apple cider vinegar.
 - Grains: quinoa, amaranth, millet, buckwheat. No rice or other grains.
 - Food Combining-** Macronutrients need different conditions in the stomach, especially for weak digestion. Doesn't combine protein and starch at a meal

Body Ecology Diet - Food Combining

Meats with vegetables or Starches with vegetables
Not meat and starches together



Low Oxalate Diet



Oxalates in Food

High oxalates (50-300 mg)

- Nuts, especially almonds & peanut
- Beans, most
- Beets
- Figs
- Rhubarb & Swiss chard
- Field greens and spinach
- Amaranth, buckwheat, and quinoa
- Soy
- Sweet potatoes
- Some berries - Goose berries, raspberries and blackberries
- Chocolate
- Citrus peel
- Kiwi and starfruit
- Tea

Low oxalates (0-10 mg)

- Avocado
- Animal foods except organ meats
- White (preferred)/brown rice
- Wild rice
- Corn - on cob or 1 cup popcorn
- Collard greens, bok choy & cabbage
- Broccoli and other cruciferous
- Pear, apple, mango, papaya, melons
- Black eyed peas, garbanzo, lima, and mung beans
- Lentils
- Pumpkin seeds & sunflower seeds



Oxalates

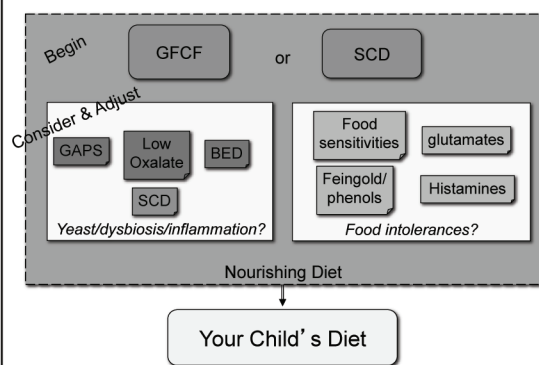
- Genetic differences in the ability to handle oxalate.
- Oxalates broken down by probiotics* (VSL#3)
- Oxalates can be very addicting
- Certain diets can be very high in oxalate: SCD (nut flours) and Body Ecology (buckwheat, quinoa, amaranth)
- Parents report: energy, sleep, skin, motor skills, mood, growth, and gut improvements. More study needed.



Diet Benefits

Diet Options	Benefits
GFCF (Gluten-free and Casein-free)	Good diet to start with Reduce gut inflammation Reduce opiates
Food Sensitivity Elimination/ Rotation Diet	Follow up on GFCF to refine food sensitivities
SCD (Specific Carbohydrate Diet)/GAPS	Excellent for severe gut inflammation Very helpful for diarrhea/constipation not addressed by GFCF Starves out dysbiotic flora
Feingold Diet/FAILSAFE/ Low Phenols	Good for food addictions: grapes, apples, bananas, artificial ingredients Hyperactivity, asthma, irritability, red cheeks
Body Ecology Diet	Great for ridding candida Populating good bacteria
Nourishing Traditions/ Weston A. Price	Nourishing diet High quality fats, fermented foods, nutrient-rich
Low Oxalate Diet	Inflammation/pain, energy and cognition, motor skills, GI symptoms, and yeast

Diet Strategy



Holistic Nutrition Approach

12 Steps Discussed in detail in "Nourishing Hope for Autism"



*from "Nourishing Hope for Autism"



Possible Causes Picky Eating



- Addictions to opiates (gluten/casein) cause consumption of primarily wheat and dairy containing foods
- Addictions to chemicals (MSG, artificial additives) cause restriction to one brand or large preference for processed foods
- Nutrient deficiencies (zinc) makes everything taste bad or bland.
- Yeast, viral, and microbial overgrowth may cause focus on eating mainly high carb and sugar foods
- Sensory sensitivities can restrict the consumption of certain textures - Seek a feeding therapist when needed



Ideas for Picky Eating



- Remove addictive foods
- Improve nutrient status with supplementation
- Get creative with TEXTURE
 - Chicken pancakes and meatballs for protein
 - Vegetable Laktes and Carrot/Kale Chips for vegetables
- Incorporate (“hide”) pureed vegetables in muffins, pancakes, meatballs, pasta sauce
- Visual Presentation

Ideas and Recipes for Picky Eaters in Cooking to Heal



100 Healing Recipes

Cooking to Heal Video and Cookbook Tool



- All Recipes labeled/tagged as:
 - GFCF, SCD, LOD, Body Ecology, Feingold, Fallsafe
 - Egg-free and Nut-free
 - All recipes Gluten-free, casein-free, soy-free, and corn-free
- Making fermented foods
 - Raw sauerkraut, kefir, kombucha at a fraction of the cost of store bought. Gives you flexibility in flavor and ingredients.
- Coconut milk and seeds milks (useful for nut allergies)
- Tasty vegetable recipes
- Basics
 - Chicken stock, chicken nuggets, juicing recipes



Nutrition Education & Cooking Demonstration
Special diet recipes, substitutions, and tips for implementing the dietary principles in special healing diets. Kid-friendly recipes and ideas.

FOR THOSE FOLLOWING:
• Gluten-free Casein-free (GFCF) • Specific Carbohydrate Diet™ (SCD)
• GAPS • Low Oxalate • Body Ecology

4-hour workshop **DVD** with Cookbook



Listen & Watch Julie in the Kitchen

TOPICS INCLUDE:
Nutrition & Diet
Quality & Fermented Foods
Broths & Soups
Soaking Seeds & Grains
Healthy Desserts



Follow along in Cookbook Practical Recipes

LEARN ABOUT:
REMOVING inflammatory and problematic foods
ADDING easy to digest, nutrient dense foods

Recipe excerpt from *Cooking To Heal*

Bean Burgers

To make FG, limit herbs and spices to parsley, salt and pepper.

1 cup black or kidney beans
1 cup sunflower seeds
4 eggs
½ cup carrots – peeled, grated

Additional ideas and tips –

Each recipe labeled for autism diet compliance

GFCF/SCD/FG Nut-Free

Indicates that Julie demonstrates this recipe on the DVD



Chart Progress and Further Refine

- Correlations not always clear - Keep diet record.
- Add one food at a time - Take note.
- Avoid changing foods & supplements simultaneously.
- Watch for symptoms or regression:
 - Sometimes a “regression” is actually a sign of healing, i.e. removal of gluten/casein may cause opiate withdrawal
 - However, sometimes a new food substitution (corn) is problematic and needs to be removed
- Look for improvement
- See what’s remaining, and consider additional diets/dietary intervention. Changing the diet or layering diets
- Seek nutrition support from a qualified professional



Customized Nutrition Support By Telephone & Skype with Julie Matthews

Contact my office to arrange an appointment or a free 15-minute consultation



1 (415) 235-2960

Info@nourishinghope.com



Nourishing Hope Support

Nourishing Hope for Autism
Autism Diet & Nutrition Guide

- Scientific rationale for nutrition intervention
- Role of genetics and environmental factors
- Impact of nutrients on biochemistry and healing
- The most beneficial dietary options for autism

Gold Medal
Autism Support

“This book inspired me and helped my son tremendously.”
Katie Wright, Mom
Board Member, National Autism Association

Cooking To Heal
Autism Nutrition & Cooking Class
Cookbook & DVD

Autism LIVE Workshop

“My biggest ‘aha’ was adding good nutrition back into a limited diet.”
Katalina, V. Mom

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NourishingHope.com
415-235-2960

