


Feeding kids well
Optimizing health outcomes with integrative and functional nutrition

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1

Objective:

- Identify key nutrients and nutrition interventions to improve health outcomes in pediatric populations



<http://allinafiles.com/910273.pdf>

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2



3

Integrative & Functional Nutrition

Evidence based care

- Considers the interplay between a person’s genetic predispositions, microbiome, environmental inputs, and lifestyle.
- **Patient-/client-centered care** that is respectful, emotionally supportive, responsive to individual patient/client preferences, needs, beliefs, and values

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Noland D, Raj S. *J Acad Nutr Diet.* 2019;119(6):1019-1036.e47 4

4

A POSITIVE FOOD RELATIONSHIP


- Support

- Support a positive relationship to food, and intuitive eating skills.
- Model

- Model healthy habits, and talk about food, bodies, hunger and fullness in a positive way.
- Low pressure

- Avoid too many rules or pressure around how or what to eat.
- Relax

- Keep mealtime environments relaxed without too many distractions.



5

NOURISHING FOODS


- Variety

- Offer a variety of whole foods and colorful plant foods in your child's diet to provide nutrients that support healthy growth.
- Produce

- Serve veggies and fruit routinely with meals and snacks.
- Balance

- Combine whole food sources of fruits and vegetables; proteins and fat; beans, starches and whole grains; and fun elements at meals to help children find choices they enjoy, and stay energized and focused.
- Hydration

- Serve water and other unsweetened beverages throughout the day



6

LIMITING ADDITIVES AND ULTRAPROCESSED FOODS


- Limit**
 - Reduce ultraprocessed or refined ingredients and additives for the whole family.
- Find**
 - Look for convenient meal and snack items your family enjoys that have more whole food ingredients.
- Planning**
 - It takes some extra planning, but can make a difference in the nutrients your child eats each day



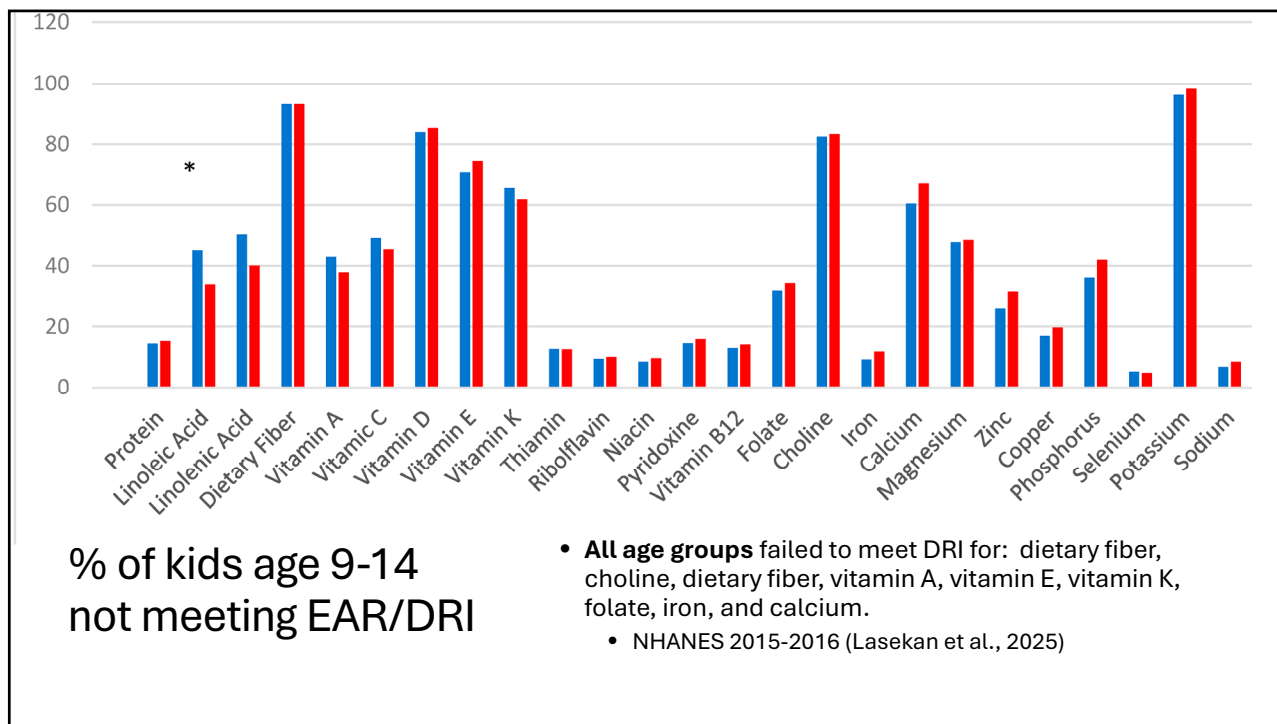
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GET THE KIDS INVOLVED

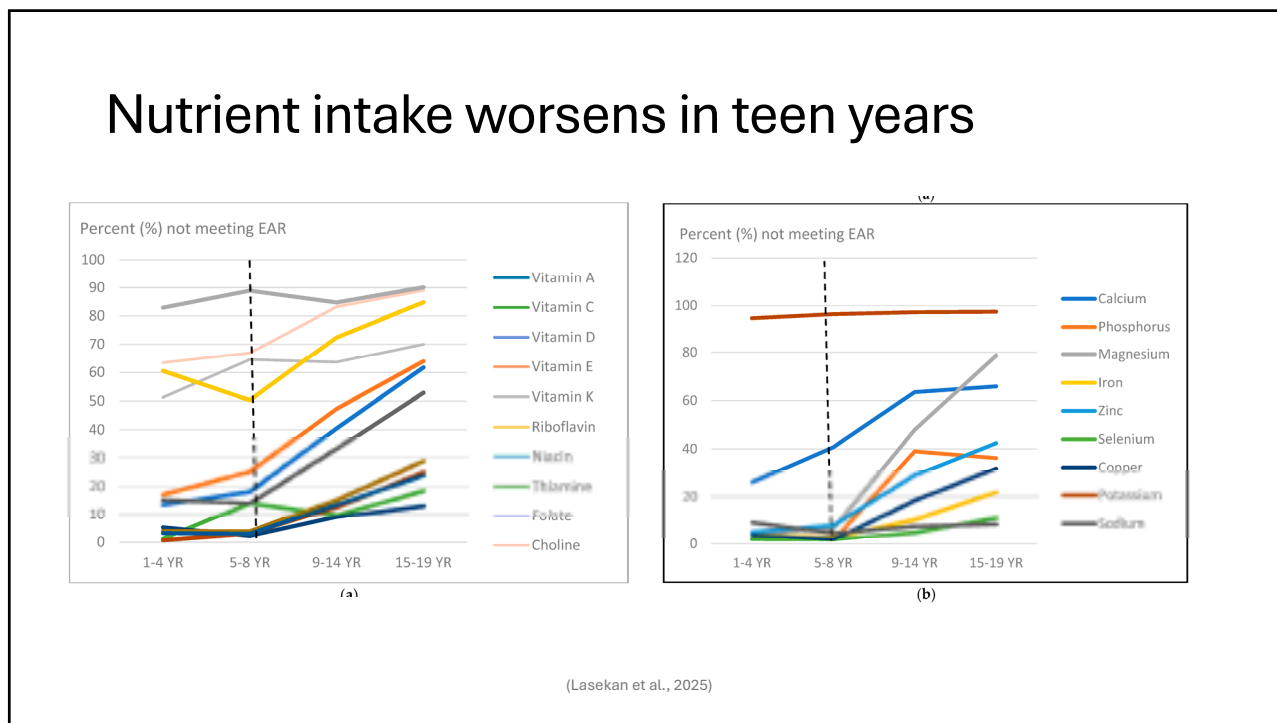
- Include**
 - Keep them involved! Kids at every age are able to contribute to the planning, cooking, and mealtime experience!
- Exposure**
 - The more exposure they have, the more skills they build for feeding themselves well in the future.



8



9



10

Kids aren't getting enough nutrients

- In Minnesota: 22% of 1-5 years old are not eating **<1 fruit daily**, 41% are eating a **<1 vegetable daily**, and 55% have had at least **1 sweetened beverage** in the past week. (2021 NHANES data. Hamner et al., 2023)
- **Food insecurity** is associated with lower micronutrient intake, especially in adolescent girls. (Jun et al., 2021)
- Children consuming **plant-based diets** risk low vitamin B12, iron, and zinc (Neufingert & Eilander, 2023)
- Children on **gluten free** diets: risk for ↓ B vitamins, iron, zinc, fiber; ↑ Arsenic
- Children on **dairy free** diets: ↓ Calcium, Vitamin D, Vitamin K2; ↑ risk for lower bone mineral density and fracture risk later in life (Ratajczak et al., 2021)
- Children with **ASD**: ↓ Ferritin, zinc, calcium, Vitamin D, B vitamins, and Vitamin A, Vitamin C. (Nogueira-de-Almeida et al., 2025)
- Children with **ADHD**: ↓ B12, folate, B6, ferritin, MUFA, ↑ saturated fatty acids (SFA), n-6/n-3 fatty acid ratio (Wang et al., 2019)

11

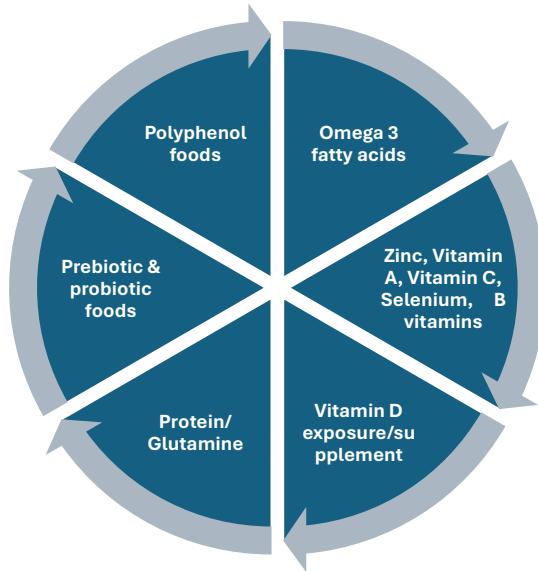
11

Why do nutrients matter?

- Cofactors & cofactors in energy metabolism & enzyme activity
- Antioxidant - reducing the cell damage & oxidative stress
- “energy production, organ function, RNA and DNA synthesis, promotion of physical growth, sexual maturation, neuromotor development, and immune responses” (Hong, 2025)
- Low folate – weight loss, headaches, behavioral changes, and stunted growth, anemia. (Hong, 2025)
- Low Mg, Cu, and Zn are associated with neurodevelopmental delay. (Shen et al., 2025)
- Low magnesium intake is related to hypertension risk in children (Gong et al., 2024)
- Zinc plays a crucial role in maintaining gastric integrity (Chao, 2023). Deficiency also causes growth delays, poor immunity/infection risk, poor taste & smell. (Hong, 2025)
- Low B12 => impaired brain and motor development. (dos Santos et al., 2024)

12

Immune health in kids



- “A complex interplay exists between diet, microbiome, and epigenetic factors”. (Verduci & Köglmeier, 2021)

13

It's not always realistic to test every micronutrient – what do we do instead?

FOCUS ON DIET QUALITY

14



Colors / polyphenols

- Non-nutrient, bioactive compounds
 - Neuroprotective, Anti-inflammatory, protect against oxidative stress
 - Polyphenols act as prebiotic in microbiome, increase SCFA
 - Flavonoids are cardioprotective
 - Promotes diversity of nutrient intake
- (Minich DM. 2019) (Plamada D et al. 2021)

15

Eat the Rainbow!

Colorful Food

The more colorful foods you eat, the more nutrients you get. There are many whole foods to choose from that add color into your meals.

RED	ORANGE	YELLOW-GREEN	GREEN	BLUE-PURPLE
<ul style="list-style-type: none"> Tomatoes Watermelon Strawberries Red bell peppers Red onions Red grapes Red beans Red lentils Red quinoa Red rice Red pasta Red soybeans Red soybean oil Red soybean lecithin Red soybean meal Red soybean flour Red soybean protein Red soybean fiber Red soybean hulls Red soybean skins Red soybean meal Red soybean flour Red soybean protein Red soybean fiber Red soybean hulls Red soybean skins 	<ul style="list-style-type: none"> Carrots Orange bell peppers Orange sweet potatoes Orange squash Orange lentils Orange quinoa Orange rice Orange pasta Orange soybeans Orange soybean oil Orange soybean lecithin Orange soybean meal Orange soybean flour Orange soybean protein Orange soybean fiber Orange soybean hulls Orange soybean skins 	<ul style="list-style-type: none"> Yellow bell peppers Yellow sweet potatoes Yellow squash Yellow lentils Yellow quinoa Yellow rice Yellow pasta Yellow soybeans Yellow soybean oil Yellow soybean lecithin Yellow soybean meal Yellow soybean flour Yellow soybean protein Yellow soybean fiber Yellow soybean hulls Yellow soybean skins 	<ul style="list-style-type: none"> Spinach Broccoli Green bell peppers Green sweet potatoes Green squash Green lentils Green quinoa Green rice Green pasta Green soybeans Green soybean oil Green soybean lecithin Green soybean meal Green soybean flour Green soybean protein Green soybean fiber Green soybean hulls Green soybean skins 	<ul style="list-style-type: none"> Blueberries Purple grapes Purple lentils Purple quinoa Purple rice Purple pasta Purple soybeans Purple soybean oil Purple soybean lecithin Purple soybean meal Purple soybean flour Purple soybean protein Purple soybean fiber Purple soybean hulls Purple soybean skins

Tracking Colors and Variety

WEEK 1	SUN	MON	TUE	WED	THU	FRI	SAT
Choose foods from each color group every day	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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WEEK 2	SUN	MON	TUE	WED	THU	FRI	SAT
Choose foods from each color group every day	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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16

Environmental exposures - BPA

- Not just the food, it's the PACKAGING!
- BPA exposure impairs various structural and molecular brain changes, promoting oxidative stress, changing expression levels of several crucial genes and proteins, destructive effects on neurotransmitters, excitotoxicity and neuroinflammation, damaged blood-brain barrier function, neuronal damage, apoptosis effects, disruption of intracellular Ca^{2+} homeostasis, increase in reactive oxygen species, promoted apoptosis and intracellular lactate dehydrogenase release, a decrease of axon length, microglial DNA damage, astrogliosis, and significantly reduced myelination. (Costa & Cairrao, 2024)
- "Epidemiological studies showed that the adverse effects of BPA on neurodevelopment in children contributed to the emergence of serious neurological diseases like ADHD, ASD, depression, emotional problems, anxiety, and cognitive disorders." (Costa & Cairrao, 2024)
- Urinary BPA levels Children and Teens with highest BPA levels in urine, 25% more likely to be overweight and 2-2.5x more likely to be obese. (Trasande et al., 2012)
- Consuming canned soup for 5 days= >1000 fold increase for urinary BPA. (Carwile et al., 2011)

17

Environmental Exposures - Phthalate

- CHARGE Study: Early childhood exposure to a **phthalate** mixture was associated with ADHD symptoms, particularly among children with ASD.
- used to make plastics more flexible, they are also found in some food packaging, cosmetics, children's toys, and medical devices
- Where are phthalates found in our food supply?
 - Restaurant, cafeteria, and fast foods.
 - Poultry and high fat meats
 - Dairy products
 - Cooking oils

(Oh J. et al. 2024)

18

18

Environmental exposures

- Tips for reducing exposures to industrial chemicals are:
 - **Eat fewer processed foods, which often contain chemical additives.**
 - **Eat organic produce.** It's grown without synthetic pesticides and preservative chemicals.
 - **Don't microwave food in plastic containers, use glass or ceramics.**
 - Run your tap water through a home filter before drinking. Filters can reduce levels of common tap water pollutants.
 - **Eat fewer meat and high fat dairy products,** which contain higher levels of some pollutants.
 - Reduce the number of cosmetics and other personal care products you use, which can contain harmful chemicals and can be sold with no safety testing.
 - Avoid artificial fragrances.
 - Don't use stain repellants on clothing, bedding or upholstery.
 - Reduce the number of household cleaners you use. Try soap and water first.
 - Avoid using gasoline-powered yard tools — use manual or electric tools instead.
 - Avoid breathing gasoline fumes when you're filling your car.
 - **Eat seafood known to be low in PCB and mercury contamination,** including wild Alaska salmon and canned salmon. Avoid canned tuna — it contains mercury.

<https://www.ewg.org/research/body-burden-pollution-newborns>

19

Top 3 peds nutrition concerns

- ASD/ADHD related food concerns
- Picky Eating
- Constipation & abdominal pain

20

Nutrition and our kids' mood

Depression, anxiety, mood, eating disorders are common in adolescents – a time when nutrient intake is often declining

- “Compelling evidence was found for the Mediterranean diet and ... depression” (Lassale et al., 2019)
- Nutritional lithium (1-30mg) (Greenblatt, J. 2025)
 - for suicidal ideation, impulsivity, aggression concerns
 - decreases neuroinflammation
- Vitamin C for childhood depression: 24 children with MDD 500mg 2x/day + fluoxetine. Significantly improved vs fluoxetine alone. 48% improvement after 6 months. (Amr et al., 2013)

Zinc deficiency & eating disorders (vegetarian, dieting, low quality diet, OCP's).

Depression is highly correlated with zinc status

(Greenblatt JM & Delane DD, 2018)



21

Appleton Central Alternative School:

- Appleton Central Alternative Charter School – 1998-2003 CASE STUDY
 - at risk students, 10-12th grade
 - Removed all vending machines
 - Provided basic breakfast and “a healthy and natural lunch” cooked from scratch in house.
- Breakfast: whole grain bread, bagels, muffins and granola with an “energy drink” and milk.
- Lunch: fresh entrée, free of additives or chemicals, fresh fruit, a salad bar, whole grain breads, low fat cookies for dessert and an energy drink and/or milk.
- “Negative behaviors such as vandalism, drug and weapons, violations, dropout and expulsion rates, and suicide attempts are virtually nonexistent” - *Principal LuAnn Coenen*
- Improved rates of attendance, suspension, and truancy (based on filed state reports).
- Staff reported decreases in:
 - disruptive behavior
 - health complaints
 - impulsive behaviors,
 - fidgeting
 - use of foul language



<https://www.sustainlv.org/one/wp-content/uploads/Appleton-school-food-study.pdf>

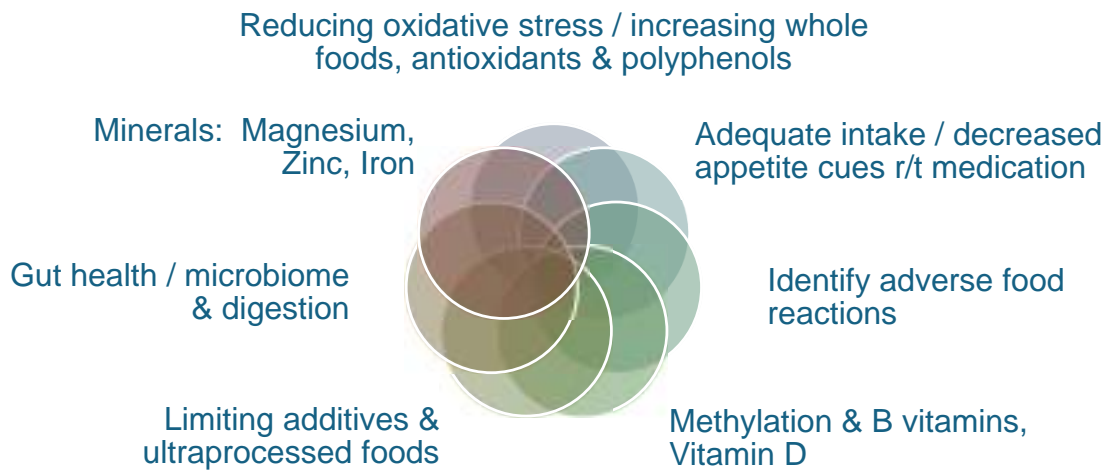
22

Top 3 peds nutrition concerns

- ASD/ADHD related food concerns
- Picky Eating / problem feeders
- Constipation & abdominal pain

23

ADHD - Nutrition Priorities



(Lewis et al., 2025) (Zhou et al., 2024)

24

24

ADHD & Polyphenols

Sources of OPC
(Oligomeric
Proanthocyanidins)
Polyphenols:

Blueberries
Curcumin (turmeric)
Green tea
Dark chocolate
Pine bark (Pycnogenol)
Grape seed extract
(GSPE)



- **Polyphenols can increase mental alertness, lower impulsivity, aggression and restlessness, and improve cognitive performance in children and adults with ADHD** (Greenblatt J. 2025)
- Higher dietary polyphenol intake is associated with lower risk of ADHD in children. (Darzi et al., 2022)
- Polyphenols support cognitive function by:
 - Unique ability to cross BBB and support healthy BBB function
 - Enhance blood flow, reduce oxidative damage & inflammation, Increase BDNF, Improves theta waves (Greenblatt J. 2025)
 - Regulating gut-brain axis by affect on the gut microbiome (Chen et al., 2025)
- **Polyphenols are effective for the treatment of ADHD alone *and* in combination with traditional drugs** (Turiaco et al., 2024)
- **Polyphenols can reduce ADHD symptoms as well as side effects related to conventional therapies** (Turiaco et al., 2024)

25

25

ADHD

- Diet changes:
 - Mediterranean diet - Correlated with lower impulsivity and inattention (Lewis et al., 2025)
 - Gluten Free - gluten-free diets may alleviate ADHD symptoms despite negative celiac serology (Abhishek et al., 2024)
 - Oligoantigenic / Elimination diet
 - Common reactive foods include: Milk, chocolate, soy, eggs, wheat, corn, legumes, grapes, tomatoes, and orange. (Stevens et al., 2011)
 - "A trial elimination diet is appropriate for children who have not responded satisfactorily to conventional treatment or whose parents wish to pursue a dietary investigation." (Stevens et al., 2011)
 - Healthy diet vs Elimination diet?
 - 165 children randomized to either diet: 51% of healthy diet group improved, 35% of elimination diet group improved. (Huberts-Bosch et al., 2024)
 - Limiting Food additives / chemicals ... ?

26

26

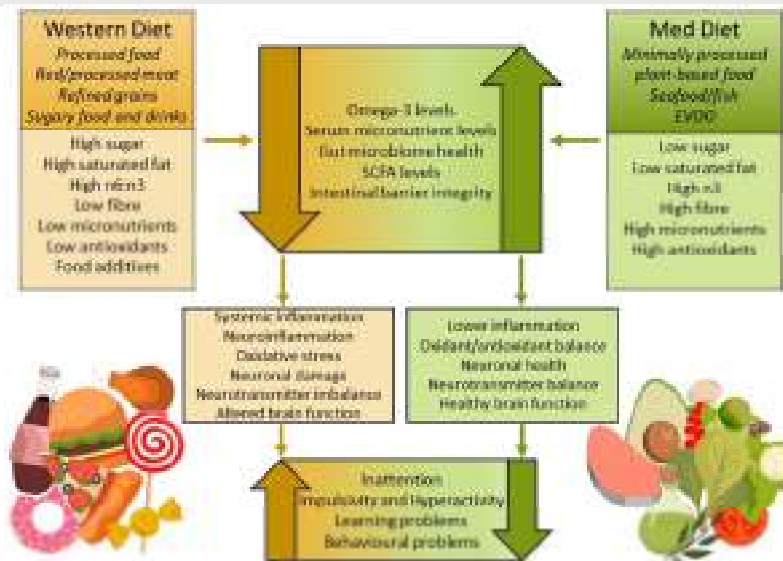
Food additives, chemicals, and adverse food reactions

- “The body of evidence from human studies indicates that synthetic food dyes are associated with adverse neurobehavioral outcomes in children, and that children vary in their sensitivity to synthetic food dyes.”
 - Potential Neurobehavioral Effects of Synthetic Food Dyes in Children. OEHHA. (2021, April 16).
- Of children with suspected sensitivities, 65% to 89% reacted when challenged with at least 100 mg of artificial food coloring.
 - (Stevens et al., 2011)
- Feingold / FAILSAFE Diet - *Salicylates, artificial colors, sweeteners, flavorings & preservatives, biogenic amines, glutamates*



27

ADHD



(Lewis et al., 2025)

28

28



Image source: Oldwayspt.org

29

AUTISM



(Nogueira-de-Almeida et al., 2025)

30

30

Combined approach for ASD

- Researchers studied the additive use of: Vitamin/mineral supplement, essential fatty acids, Epsom salt baths, carnitine, digestive enzymes, and a healthy gluten-free, casein-free, soy-free (HGCSF) diet.
- “Effective at improving nutritional status, non-verbal IQ, autism symptoms, and other symptoms in most individuals with ASD”.
- “Comprehensive nutrition/diet protocol was safe and effective. The nutritional supplements and healthy diet improved nutritional status, and hence presumably increased the brains ability to function and learn.”

(Adams et al., 2018)

31

Failsafe or Healthy Diet & ASD

- Healthy and Feingold diets were the two top-rated diets for overall benefit in ASD
 - Healthy: 67% reported general benefit. Improved constipation, attention, cognition, irritability, anxiety.
 - Feingold: 41% reported general benefit. Improved Hyperactivity, Irritability, Attention, Aggression, Anxiety, , cognition, Sensory sensitivity, sleep
- Gluten-free/Casein-free diet was among the top for overall reported symptom improvements

(Matthews & Adams, 2023)

32

32

Gluten Free / Casein Free & ASD

- No evidence for recommending GF/CF diet based on ASD alone. (Keller et al., 2021)
- Meta-analysis showed that a GFCF diet can reduce stereotypical behaviors and improve the cognition of children with ASD (Quan et al., 2022)
 - Higher proinflammatory cytokines following exposure to gluten, casein
 - Higher IgG/IgA Antibodies to gluten/casein
 - Gluten and casein peptides may act as opioid agonists, cross BBB
 - Increased Zonulin production → intestinal permeability.
 - Celiac / non-celiac gluten sensitivity
 - Cerebral folate deficiency.

(Baspinar & Yardimci, 2020)

33

33

Cerebral Folate Deficiency

- 5-10% of the population is limited in absorbing folate into the brain due to the presence of an autoantibody for the folate receptor
- **Children with ASD are 20x more likely to have Folate Receptor Antibodies (FRA)**
- L-methyl-folate or L-folinic acid cross the blood brain barrier via a low-affinity transport, higher blood levels are needed to achieve increases in cerebral folate.
- Bio-available folate is present in many foods, including legumes, leafy greens, and fruits.
- Additional concern with **MTHFR genetic SNPs** & reduced folate bioavailability
- **Folic acid** – fortified in wheat, white rice, corn masa flour & found in supplements – may compete with active folate at receptors, potential to worsen CFD

(Ahmavaara & Ayoub, 2024)

34

Dairy free & ASD

- Folate receptor antibodies in milk mimic those in humans.
- **Children receiving a milk-free diet showed a significant drop in FRα antibody titers after 3–6 months** that rose again after re-introduction of bovine milk. (Bobrowski-Khoury et al., 2021)
- Essential to replace nutrients i.e. Vitamin D, Protein, Calcium, iodine, B12.

35

35

Elimination diets

- Valid options to consider, AND not without risks
- Essential to support family, child in planning and strategies to implement food changes at home
- Care to ensure presence of acceptable “safe” foods prior to elimination
- Potential for nutrient deficiencies without supported nutrition plan for nutrient rich alternatives
- Excess focus on food may trigger disordered eating
- Consider hidden costs of elimination diets: social, financial, psychological, etc.

36

Autism and digestion

- GI problems are strongly correlated to autism severity (Adams et al., 2018)
 - 20% have 2 or more enzyme deficiencies: Lactase, maltase, sucrase, palatinase, or glucoamylase. (Adams et al., 2018)
- Enzymes with ASD:
 - **Adding digestive enzymes x3 months** → “significant improvement in emotional response, general impression autistic score, general behavior and gastrointestinal symptoms”. (Saad et al., 2015)

37

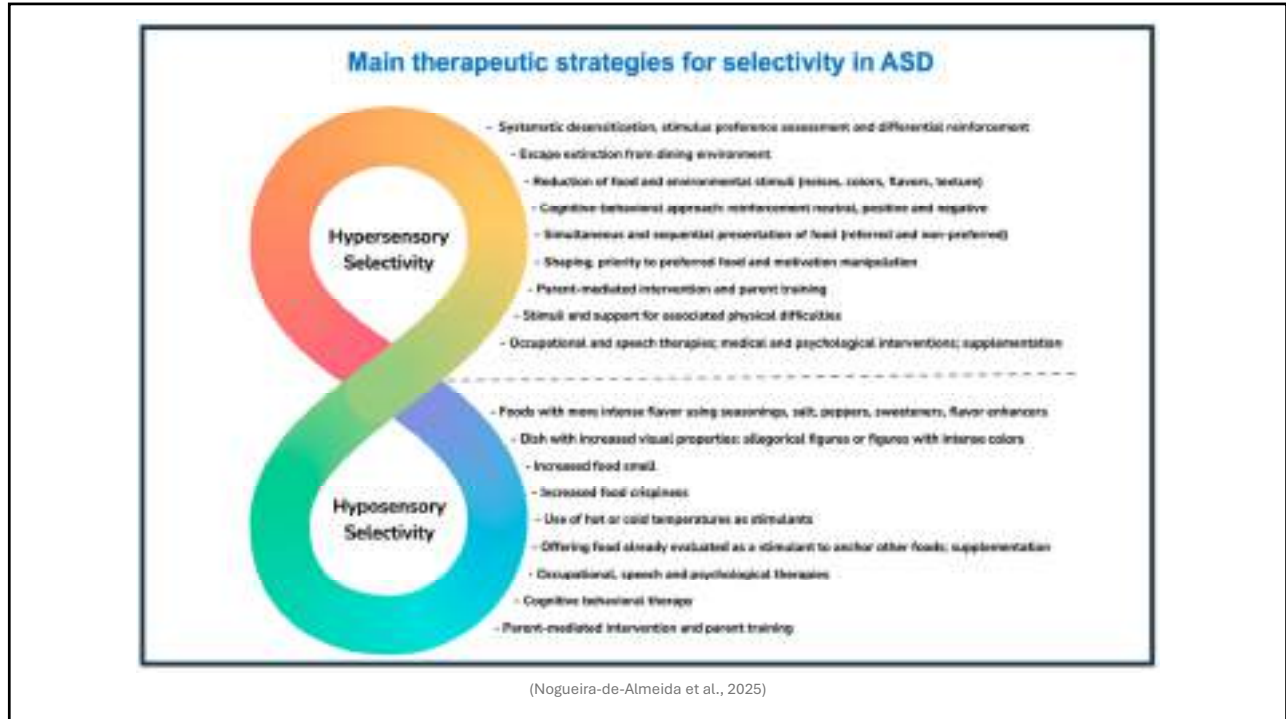
37



PICKY EATING / PROBLEM FEEDERS

- **Priority of identifying the drivers of the behavior**
 - Perceived Pressure / demand avoidance
 - Hyper or hypo-sensory selectivity
 - Rigid thinking
 - Fear i.e. Pain or discomfort, choking
 - Lack of exposure / modeling
 - Learned behavior / mimicking
- **Supertasters?** TAS2R38 gene can increase sensitivity to bitter compounds
- **Blah tasters?** Consider zinc deficiency!

38



39

Picky Eating 101

- Ensure a safe, calm eating environment
 - Family meals, screens off, comfortable & supportive seat with feet supported
- Support parents in skills to reduce pressure
 - Division of responsibility
 - “You don’t have to eat it”
- Increase consistency, structure of mealtimes
 - “It’s not a mealtime now, we will eat at 6. If you need something right now, ___ is what is available”.
- Increase exposure
 - New foods presented routinely alongside preferred foods
- Add interest
 - New environments, serving strategies, curiosity triggers, engaging in preparation
- Food Hierarchy - Tasting experiments or exposure therapies as separate from routine feeding times.

AS THE ADULT, YOUR JOB AT MEALS AND SNACKS IS:

WHAT

Choose the menu and select what foods will be provided.

WHEN

Select consistent eating times when food will be provided.

WHERE

Determine the eating environment where food will be provided.

AS AN ADULT, YOU CAN TRUST THE CHILD AT MEALS AND SNACKS TO:

HOW MUCH

Determine how much to eat of the food that is offered.

WHETHER

Decide whether or not to eat the food that is offered.

<https://www.ellynsatterinstitute.org/how-to-feed/division-of-responsibility/>

40

40



PICKY EATING / PROBLEM FEEDERS

Our job is not only to support kids in **getting great nutrition today** for their growth and development, but also to help them **build skills to become competent, intuitive eaters** into adulthood

41

When is it ARFID?

- **ARFID is characterized by avoidant/restrictive eating by volume** (i.e., restriction of the amount of food) **and/or variety** (i.e., avoidance of specific food),
- **resulting in weight loss or faltering growth, nutritional deficiencies, dependence on enteral/supplemental feeding** (i.e., any enteral feeding not required by a concurrent medical condition or $\geq 50\%$ of daily caloric intake via oral supplementation),
- and/or
- **interference with psychosocial functioning.**
- *DSM-5-TR* provides examples of three ARFID profiles:
 - (a) sensory sensitivity,
 - (b) fear of aversive consequences, and
 - (c) lack of interest in food/eating.

(Kambanis & Thomas, 2023)

42

When is it ARFID?

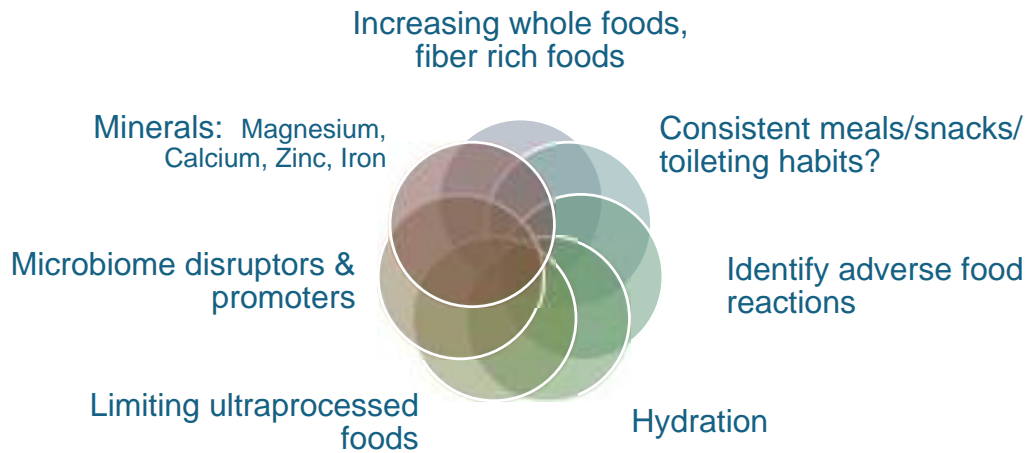
Nine Item Avoidant/Restrictive Food Intake disorder screen (NIAS) - Child

		Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
1	I am a picky eater.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	I dislike most of the foods that other people eat.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	The list of foods that I like and will eat is shorter than the list of foods I won't eat.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	I am not very interested in eating; I seem to have a smaller appetite than other people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	I have to push myself to eat regular meals throughout the day, or to eat a large enough amount of food at meals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6	Even when I am eating a food I really like, it is hard for me to eat a large enough volume at meals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7	I avoid or put off eating because I am afraid of GI discomfort, choking, or vomiting.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8	I restrict myself to certain foods because I am afraid that other foods will cause GI discomfort, choking, or vomiting.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9	I eat small portions because I am afraid of GI discomfort, choking, or vomiting.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

(Zickgraf & Ellis, 2018)

43

GUT HEALTH



44

44

MICROBIOME

• Promoters

- Colorful Plant foods
- Polyphenols (red, blue, purple, black foods)
- Prebiotic foods
- Probiotic (fermented) foods
- Regular motility!
- Outdoor play



• Disruptors

- Emulsifiers / gums
- Artificial sweeteners
- Ultraprocessed foods
- Psychological Stress & poor sleep
- Impaired digestion / GI acidity
- Some Pharmaceuticals



45

3 P's for gut health

- **Prebiotic foods.**
 - Fiber-rich plant foods that feed the healthy bacteria in your gut. i.e. onions, garlic, beans, lentils, asparagus and green bananas.
- **Probiotic foods.**
 - Fermented foods add healthy bacteria to your gut. Include foods such as sauerkraut, miso, kombucha, yogurt, kimchi and sourdough bread.
- **Polyphenols (colorful foods)**
 - Black, blue, purple and deep red foods all feed your gut bacteria. Look for colorful versions of vegetables such as blueberries, beets, raspberries, purple carrots, red cabbage and purple potatoes.
- Mediterranean Diet as a “promising therapeutic approach in patients with FGIDs” (Katsagoni et al., 2023)
- **Functional GI Pain:** Peppermint, ginger, fennel, STW 5 (Iberogast®) (Pop et al., 2023)

46

Probiotic and Prebiotic foods increase butyrate/SCFA

PREBIOTIC

- Asparagus
- Beans, Lentils, Peas, Soybeans
- Jerusalem artichokes
- Leeks
- Onions, leeks and garlic
- Chicory
- Whole Wheat
- Human Milk Oligosaccharides
- Resistant starches: (green bananas; cooked and cooled potatoes, rice, oats)
- XOS, GOS, FOS

PROBIOTIC

- Fermented Vegetables
- Kefir
- Kimchi
- Kombucha
- Miso, Natto, Tempeh (soy)
- Sauerkraut
- Yogurt
- Apple cider vinegar
- Fermented Meats, Cheeses
- Probiotic supplements

Pro & prebiotic supplements? – may be most beneficial when form & strain are chosen for targeted purpose

47

PROBIOTICS

- *L. rhamnosus GG*
 - Reduced respiratory illnesses in children attending day care (523 children ages 2-7, RDB PCT) Long term (7 mos) (Kumpu et al., 2012)
 - Children and adolescents with ADHD reported significantly better health-related quality of life as well as physical, social, school, and emotional functioning after 3 months of treatment in comparison with placebo controls. (Lange et al., 2023)
- Long term (7 mos) *L. rhamnosus GG* supplementation influences the microbiome (231 children ages 2-7, RDB PCT):
 - ↑ *Prevotella*, ↑ *Lactococcus*, and ↑ *Ruminococcus*, and ↓ *Escherichia*
 - Prevented “changes in the microbiota associated with penicillin use”.
 - Reduced frequency of GI complaints after a macrolide course.
 - “Prevented certain bacterial infections for up to 3 years after the trial, as indicated by reduced antibiotic use”.

(Korpela et al., 2016)



48

48

CONSTIPATION

- Good elimination along with whole foods support natural detoxification
 - **Fluids** (*Fluid needs age 4-8 yrs is 57oz / 7 cups*)
 - **Fiber** from whole foods (try adding Kiwi!)
 - Soluble Fiber: Oats, sweet potato, apple, banana, carrot
 - **Minerals** - Magnesium, Zinc, trace minerals
 - **Movement** – play & physical activity
- “Cow's milk is the most common culprit food allergen reported in FA-associated constipation, but other allergens, including wheat, soya, and egg have also been shown to be involved based on food challenges” (Meyer et al., 2024)

(Jackman et al., 2024)

49

49

DIARRHEA

- Consider triggers: Celiac, zinc status, Fructose or lactose malabsorption, fiber sources, sugar alcohols “ – ol ”
- Soluble Fiber: Oats, sweet potato, apple, banana, carrot, psyllium
- *Saccharomyces boulardii* (i.e. Florastor)+ Zinc
- Symbiotics (combination of probiotics + prebiotics)
 - Both greater efficacy than standard of care (Florez et al., 2018)

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“Tell me about how they are eating?”

- Nutrition has a role in every patient’s care plan
- A whole foods based, colorful, plant forward focus to nutrition is very health promoting



51

What to recommend??

- Serve a variety of whole foods and colorful plant foods
- Prepare food at home and include kids in the process



52



Food for Healthy Kids & Teens



<http://allinafiles.com/910273.pdf>

AllinaHealth

53



Integrative & Functional Pediatric nutrition referral:

- Penny George Institute Integrative Nutritionist
- 612-863-3333
- AMB CONSULT TO DIETITIAN:
 - => Integrative Nutrition/Dietitian

54

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58

58

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59

59