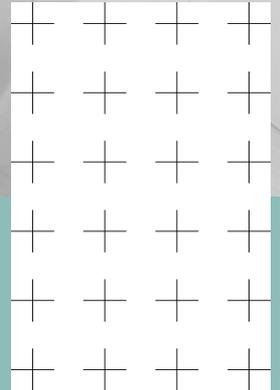


## 11<sup>th</sup> Cyprus Dietetic & Nutrition Association International Conference

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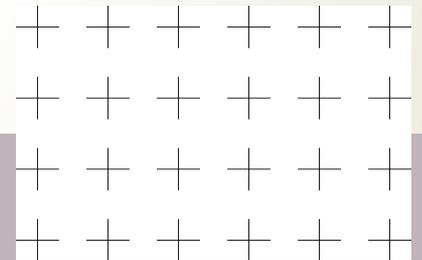
# Nutritional Guidelines for AUTISM and it's Symptoms



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# CONTENT

- › Introduction
- › Epidemiological factors
- › Literature review – Different popular diets
- › Nutritional Guidelines – Case Study
- › Nutritional Suggestions for different autistic traits that affect diet – Real Case



DISCLOSURE: The speaker does not have any potential conflict of interest

# INTRODUCTION

- › Autism Spectrum Disorder (ASD) is the most recognized neuropsychiatric disorder of childhood
- › Comorbid conditions (such as feeding disorders) are more common among people with autism than among the general population
- › 46-91% of children in ASD report gastrointestinal disorders that lead to nutritional problems (*Karhu, Zukerman et al. 2020*)
- › Families turn to alternative treatments to solve those problems, believing that they are harmless

# EPIDEMIOLOGICAL FACTORS WORLDWIDE

- Autism spectrum disorders (ASD) are a diverse group of conditions. Characteristics of autism may be detected in early childhood, but autism is often not diagnosed until much later.
- About one in 160 children worldwide has ASD. In the US 1 in 59 children has ASD.
- The abilities and needs of people with autism vary and can evolve over time. While some people with autism can live independently, others have severe disabilities and require life-long care and support.
- Evidence-based psychosocial interventions can improve communication and social skills, with a positive impact on the well-being and quality of life of people with autism and also their caregivers.
- People with autism are often subject to stigma, discrimination and human rights violations.
- Care for people with autism needs to be accompanied by actions at community and societal levels for greater accessibility, inclusivity and support.

# NUTRITIONAL IMPLICATIONS FOR ASD

- **Gluten-free and casein – Free Diets**
- Ketogenic-diet
- Probiotic Supplementation
- PUFA
- Vitamins and Minerals Supplementation
- Iron Supplementation
- Common feeding problems
- Impact of ASD to environmental factors
- Obesity

## ■ Gluten- Free and Casein-Free Diets

- › The theory behind GF/CF diets is that people with ASD have a “leaky” gut or intestine, which allows parts of gluten and casein to seep into bloodstream and affect the brain and central nervous system and worsen autism symptoms.
- › Controlled scientific studies have not proven this to be true.
- › A recent study conducted in 18 European countries, determined that 13% of children with ASD were on the GF/CF diet (Brzoska, Kazek et al. 2021).
- › Another study (as administered and reported by parents) found that children in ASD who were on GF/CF diet had at least one gastrointestinal symptom decreased, and some parents stated that their children’s concentration and attention increased, whereas the repetitive behaviours specific to the disease decreased (Panossian, Lyons-Wall et al. 2021).

## ■ Gluten- Free and Casein-Free Diets

- › Although there is a belief that the GFCF diet is completely harmless, there is not a clear conclusion that it has no risk at all, especially the nutrient deficiencies that may arise are of a great concern (Quan, Xu et al. 2021).
- › Inadequate consumption of dairy products and GFCF diets have been found to be associated with high levels of homocysteine and low bone density (Quan, Xu et al. 2021).
- › Another disadvantage of GFCF diets is that it causes social isolation.
- › In a recent study, 75% of the families implementing GFCF diets, were found to be more isolated in socializing out, and on holidays (Brzoska, Kazek et al. 2021).
- › Another study also reported that GFCF diets did not reduce autistic behaviors and that it caused social isolation (Baspinar, Yardimci 2020).

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## ■ Ketogenic-diet

- › KD has also been proposed as a nutritional intervention to ameliorate behaviour symptoms associated with ASD.
- › The literature examining the interplay between KD and ASD reveals encouraging findings in decreasing the autistic-like traits, particularly from animal studies (El-Rashidy, El-Baz et al. 2017).
- › Despite the encouraging results, human ASD studies involving KD have several important limitations (Varesio, Grumi et al. 2021).
- › The KD is associated with its own risks, including higher risk of inflammation and mitochondrial dysfunction, and the adverse effects of constipation, reflux, and other comorbidities.

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## ■ Probiotic Supplementation

- › Probiotics and their nutrient sources (prebiotics) have been shown to have positive effects on different organs of the host.
- › The idea of their potential benefits on CNS and their incidence of mental disorders, has proposed a new category of medicines called “psychobiotics” (Li-Hao Cheng, Yen-Wenn Liu et al. 2019)
- › Several studies suggest that probiotics and prebiotics might improve mental function and reduce the risk of neuropsychiatric disorder development later in childhood via several mechanisms (Ligezka, Sonmez et al. 2021).
- › It has been shown that daily consumption of probiotics may help to improve GI habits and the communicative and social functioning of people with ASD (Feng, Zhao et al. 2021).

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## ■ Polyunsaturated Fatty Acids (PUFA)

- › PUFAs have been identified as a key factor in normal brain growth and development.
- › Several studies have shown that  $\Omega$ -3 and  $\Omega$ -6 supplementation may improve hyperactivity, lethargy, and stereotypy in children with ASD (Cheng, Tseng et al. 2017).
- › Results are encouraging, but studies were limited by size and have wide discrepancies in important factors, including, dose used, duration of supplementation, and measurement of ASD. Additional research into these variables is suggested before definitive conclusions can be made.

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## ■ Vitamins and Minerals Supplementation

- › Low food variety has been frequently noted in studies that have investigated feeding difficulties in children with ASD.
- › Children with ASD may be at risk of under-consuming specific nutrients, including Ca, fibre, folic acid, vitamins A, D and E (Yule, Wanik et al. 2021).
- › Severe autism has been linked to low levels of certain nutrients (vitamins B3, B6, C, calcium, iron and zinc) (Nogay, Walton et al. 2021).

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## ■ Iron Supplementation

- › Low iron can affect brain metabolism and impair cognition by altering neurotransmitter synthesis.
- › A child with ASD who is also low in iron may find it more difficult to communicate and behave in a socially acceptable manner (PRAKASH, KUMARI et al. 2021).
- › There is a great variety of iron supplements in the market (chewable, liquid, pills) that a person can choose depending on needs and texture.

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## ■ Common feeding problems

- › ***Restrictive and selective food intake:*** Children with ASD have been observed to have picky eating behaviours for specific taste, colour, or appearance
- › ***Food Neophobia:*** Usually children are more reluctant to try fruits and vegetables, milk and other dairy products
- › ***Increased sensory sensitivity:*** Usually children have issues to try soft and slippery foods
- › ***Pica:*** eating non-edible foods like paper, paint, grass, dirt, clay, crayons

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## ■ Impact of ASD to environmental factors

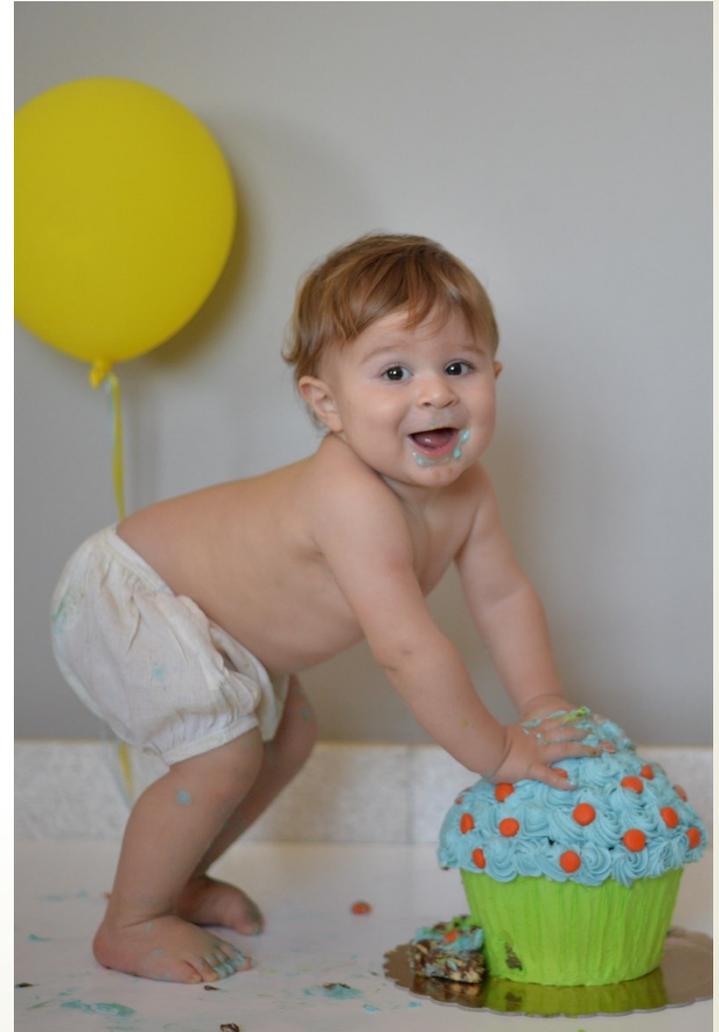
- › In severe cases, there have been reports of scurvy, vision loss, rickets, low bone mineral density, malnutrition and growth retardation (Ma, Thompson et al. 2016).
- › Good nutrition is important as poor diet can affect mood, learning and sleep (Wen, Yang et al. 2021).
- › People with autism may have difficulty with sleeping.
- › Healthy foods give the brain and body the nutrients that they need in the right amounts.

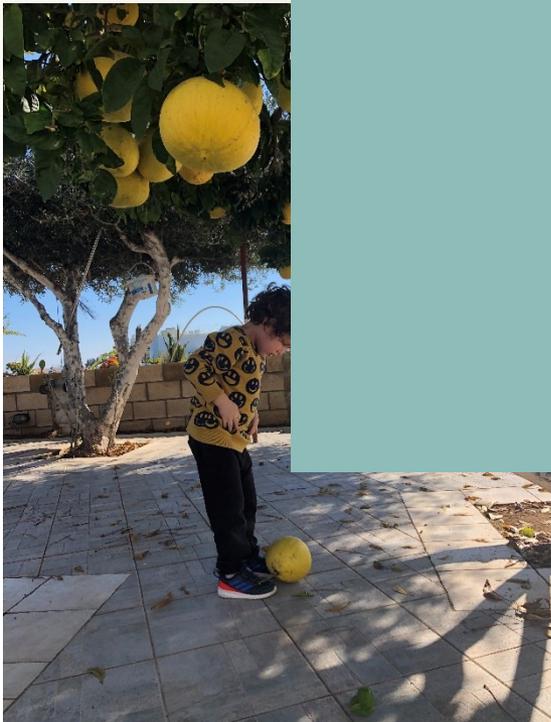
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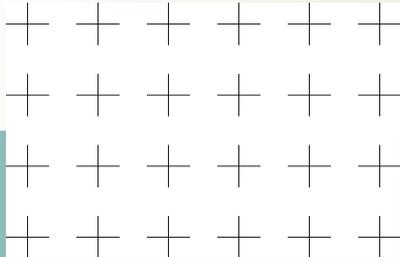
## ■ ASD and Childhood Obesity

- › Psychopharmacological treatments, genetics, disordered sleep, atypical eating patterns, and challenges of engaging in sufficient physical activity, may be associated with the development of obesity in children with ASD.
- › Studies have shown that children with ASD have reported a higher intake of energy dense foods particularly those high in fat and sugar, and a lack of milk and other dairy products, fruits and vegetables (Garcia-Pastor, Salinero et al. 2019).





CASE STUDY for you!



# A real Case Study and the role of the dietitian

- › Andreas is a 5 year old boy with mild ASD. He eats very few food choices (pasta, potatoes, soups, ice cream, and chocolate spread) specific texture (pureed), nothing green, feels stressed in every meal
- › The parents desperately want our help as clinical Dietitians.
- › What we can advice them?
  - Need of complete Nutritional analysis-Diet recall
  - Typical case of neophobia
  - Nutrition Diagnosis(PES): Insufficient amount of specific nutrients from food groups resulted by inappropriate eating habits and lack of nutritional education as evidenced for dietary hx, ASD

# Increase the food choices

- › Studies have shown that a child may take up to 20 times the exposure of a new food to accept it and try it. So we advise the parents to be patient and do not give up with the first few tries.
- › Encourage the parents to take the child to the supermarket and let him choose a new food.
- › Explain to the child where it grows, how it grows and different cooking options for him to choose.
- › It's ok for the child not to try it. Even if he becomes familiar with that food in a low pressure, positive way, eventually may become more flexible to try new foods.
- › Teach the parents to serve the new food in small portions together with a familiar food. This practice will increase his acceptance of the new food.
- › Parents and siblings must be role models and eat a variety of food.
- › Parents may choose to take their child to a school that breakfast and lunch is offered, so he will copy his peer's eating habits.

# Specific Texture

- › Andreas eats only pureed textured foods.
- › Advice parents to let him touch and play with his food before it's mashed.
- › Let him know the original texture before it's mashed.
- › Children in ASD usually are visual learners. You can show a video of the chewing and swallowing procedure and let him know that food's best blender is his mouth and his teeth are doing the blending, so it's exciting for him to be the blending machine for his food.



# Nothing Green

- › There are lots of vegetables that are not green. Make a food plan that has legumes and vegetables in other colours.
- › A good practice is to have a small vegetable garden at home or at school, that children can plant, water and harvest their own vegetables. This practice will grow their interest to try new vegetables that they produced.



# Decrease the stress at mealtimes

- › Tell parents to have a routine at meals (time, place, seat)
- › Make sure the environment is comfortable and quiet, free from disturbances (TV, tablets)
- › A busy, bright lights and full of cooking odors kitchen may be uncomfortable for a child with ASD.



# Involve him in food preparation and role modeling

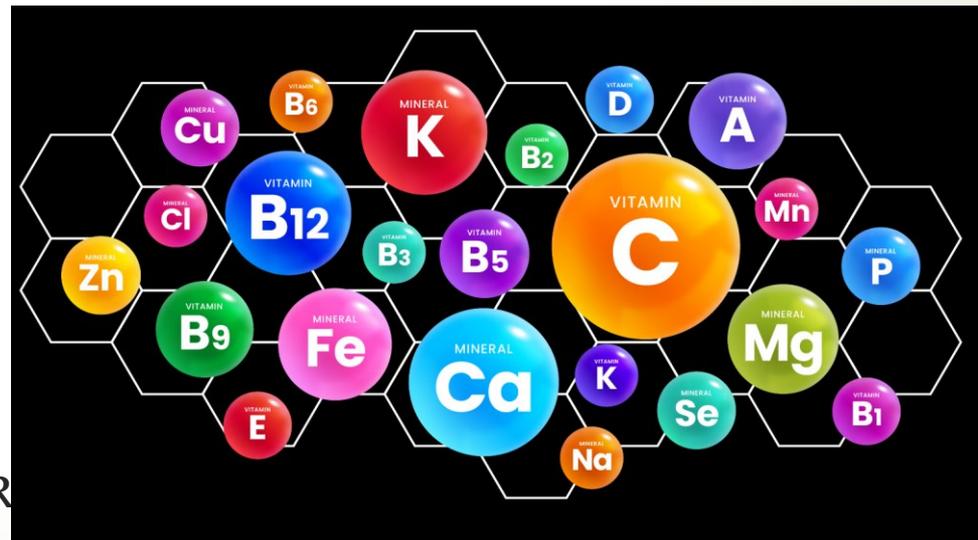


# Recommend supplementation and food choices

As health care professionals we can supplement vitamins and minerals depending on individual's deficiencies.

## SUPPLEMENTATION

- › Fe (10mg/d-DRI)
- › Ca (1000mg/d-DRI)
- › Folate (200mcg/d-DRI)
- › Vit C (25mg/d-DRI)
- › Vit A (400mcg/d-DRI)
- › Vit B6 (0.6mg/d-DRI)
- › Riboflavin (0.6mg/d-DRI)
- › Vit E(7mg/d-DRI)
- › Vit D (600IU/d-DRI)



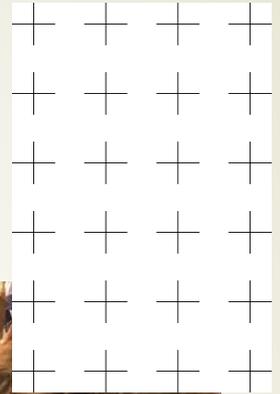
# Recommend Supplementation and food choices. Need of complete Nutritional Analysis – Diet Recall



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# TAKE HOME MESSAGE

“Autism is a lifelong condition that affects the brain and how a person communicates and relates to other people and the world around them. It can make it difficult to make friends, tell people what he needs and understand what other people think. Good nutrition is needed so that the brain can work properly. ” (BDA 2021)

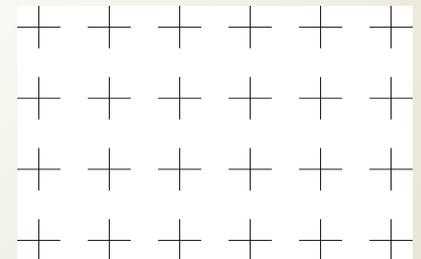


# CONCLUSION

It is currently unknown whether dietary variety and quality in childhood improves over time in people with ASD.

But it is proven that children with ASD could benefit from dietary intervention to ensure they have the best chance to grow and reach their full development potential.

It is our duty to ensure that a healthy diet plan is established and that the dietary requirements are met.



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