



Proposed summary of today's symposium

Use of food supplements in Switzerland

→ Higher consumption than needed

Proteins

→ No problem in a balanced plant-based diet

Iron

→ Attention needed in certain situations

Vitamin B12

→ Supplements absolutely needed in vegans!

Iodine

→ Iodized salt solves the problem

Vitamin D and calcium

→ Vitamin D depending basically on sun exposure; for calcium supply attention needed in certain situations

Omega-3 fatty acids

→ Supplements needed in vegetarians and vegans?

Protein in plant-based diets

- Vegetable proteins are slightly less digestible than animal proteins
- Cereal proteins contain limiting quantities of lysine, but lysine requirement can be met with a diversified intake of plant proteins
- Because children's protein requirement corresponds to 5-8% of their energy requirement and because proteins contribute at least to 10-15% of the energy of diets, a protein deficiency only occurs in the event of insufficient energy intake.
- Protein is not an issue in vegetarian and vegan diets

Pediatric considerations for plant-based diets:

Iron

Specific dietary recommendations	Testing
<ul style="list-style-type: none">▪ The risk of iron deficiency is likely not higher in children adhering to a plant-based diet vs. omnivores, but the risk increases if the dietary composition is poor▪ Dietary iron deficiency can be prevented by:<ul style="list-style-type: none">— Iron fortified foods: Check food packaging labels— Dietary bioavailability may be improved by foods enhancing absorption (vitamin C rich foods) along with meals and avoiding foods high in inhibitors (e.g. phytate, polyphenols)▪ Oral supplementation only indicated at clinical symptoms (iron deficiency or iron deficiency anemia)	<ul style="list-style-type: none">▪ Routine testing not necessary<ul style="list-style-type: none">— Serum ferritin (note: influenced by infection & inflammation)— Hemoglobin

Pediatric considerations for plant-based diets: **Vitamin B12**

Specific dietary recommendations	Testing
<ul style="list-style-type: none">▪ Healthy children adhering to an unsupplemented, unfortified plant-based diet have a high risk of developing vitamin B12 deficiency▪ Dietary B12 deficiency can be prevented by:<ul style="list-style-type: none">— Vitamin B12 fortified foods: Check food packaging labels— Taking an oral B12 supplement (4-20 µg per day with cyanocobalamin): Should be taken with other foods for optimal absorption	<ul style="list-style-type: none">▪ Yearly▪ No «gold standard» to test vitamin B12 deficiency. Several biomarkers available, with preference to:<ul style="list-style-type: none">— Serum B12 (note: concentration within the normal limit does not exclude deficiency)— Holo-transcobalamin (holo TC) (The reference values depend on assay method)

Pediatric considerations for plant-based diets:

Iodine

Specific dietary recommendations	Testing
<ul style="list-style-type: none">▪ Low risk of iodine deficiency in all population groups and diets if most of the salt consumed is iodized.▪ In countries with voluntary salt iodization (CH & many European countries): Many ready-made foods and food products are produced with non-iodized salt. This increases the risk of inadequate iodine intake, particularly in children adhering to a vegan diet or children not consuming milk and dairy products	<ul style="list-style-type: none">▪ Routine testing not recommended– Urinary iodine concentration: No individual biomarker due to high day-to-day variability (n=10 repeated spot urine samples needed)– TSH (if <i>no</i> iodized salt consumed)

Pediatric considerations for plant-based diets:

Iodine

Specific dietary recommendations	Testing
<ul style="list-style-type: none">▪ Dietary iodine deficiency can be prevented by:<ul style="list-style-type: none">– Iodized salt in cooking and at the table– If processed foods are consumed, products produced with iodized salt should be selected: Check food packaging labels for iodized salt– If plant-based milk and dairy alternatives are consumed, products fortified with iodine should be chosen: Check food packaging labels▪ Oral iodine supplementation only indicated at no or very low intake of iodized salt▪ At incomplete coverage of iodized salt: Pregnant and lactating women consuming a prenatal dietary iodine supplement are recommended to choose a product containing iodine	



Vitamin D and calcium

- **Calcium** supply may be critical in a vegan diet (and in an ovo-vegetarian diet)
 - Recommendation for **calcium-rich vegetables and mineral (or tap) water**
 - **Supplementation** (supplements or fortified foods) may be needed
- **Vitamin D** is basically no problem in plant-based diets
 - Recommendation for supplementation **equal to omnivores**
 - Attention needed in certain situations (dark skin during wintertime)

Pediatric considerations for plant-based diets:

Omega-3

Specific dietary recommendations	Testing
<ul style="list-style-type: none">▪ Limited data in children, but available evidence suggest adequate ALA intake and lower EPA and DHA in vegetarians (except pescatarians) and vegans compared to omnivores▪ Dietary considerations to prevent omega-3 deficiency:<ul style="list-style-type: none">— Increase consumption of ALA rich foods and oils- 1-3 teaspoons of ALA-rich oil (rapeseed, flaxseed, or walnut oil)- Use of rapeseed oil for cooking and shallow frying- ALA rich oils should replace fat/oil rich in saturated fatty acids (e.g. butter, peanut and coconut oil), and linoleic acid (e.g. sunflower oil) to increase conversion rate of ALA to EPA and DHA)▪ Non-fish-eating individuals may benefit from DHA (+EPA) supplements (e.g. alga-based)	<ul style="list-style-type: none">▪ Routine testing needed? (no consensus, but n-3 PUFA status may be assessed and monitored)— Omega-3 index



Final conclusions of today's symposium

- **Flexitarian** and **vegetarian** diets in children
 - All dietary requirements are generally met in a balanced diet (*Controversial: Omega-3 fatty acid requirements in vegetarians?*)
- **Vegan** diets in children
 - **Protein:** requirements are met
 - **Iodine:** requirements are met with the use of iodized salt
 - **Iron, calcium** and **vitamin D:** special attention needed (clinical dietary assessment); if critical → measurement of biomarkers (ferritin, Hb; 25-OH-D) and supplementation if needed
 - **Vitamin B12:** supplements (4-20 µg per day) are required in a vegan diet
 - *Controversial: Omega-3 fatty acid requirements in vegans and vegetarians?*
 - **Cave:** A vegan diet in **infants** and **toddlers** is challenging and families need support



SYMPOSIUM NUTRITION AND HEALTH

Pflanzliche Ernährung in der Pädiatrie: Braucht es Strategien zur Vorbeugung von Nährstoffmangel?

*Plant-based diets in Paediatrics:
Are specific strategies needed to prevent nutrient
deficiencies?*

Thank you for your attention!