

HEADLINE

Combating preterm birth — Think nutrition first

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“Think nutrition first”, the message from The International Federation of Gynecology and Obstetrics (FIGO)¹, may help to optimize pregnancy outcomes through the potential role of nutrition on preterm birth.

An appropriate meal timing and night sleep duration could also contribute indeed. In a Singapore cohort with 673 pregnant women, **night-eating (consuming > 50% of total daily energy from 19:00 to 06:59 was associated with 0.45 weeks shortening of gestation period (95% CI -0.75, -0.16) and 2.19-fold higher odds of preterm delivery (1.01, 4.72)²**. Short sleeping period (< 6 hours of night sleep) was correlated with 0.33 weeks shortening of gestation period (-0.66, -0.01) while no significant finding was recorded for preterm delivery².

A case-control study in China revealed that fat and vitamin E intakes were lower in preterm delivery mothers ($n = 130$) versus term delivery mothers ($n = 381$, $p < 0.05$)³. Alarming, imbalanced dietary intakes were noted in both preterm and term delivery groups³. Both had insufficient intake of fiber and protein, while mean intakes of vitamin A, calcium and iron were far below the Chinese Dietary Reference Intakes (DRIs)³. Importance of nutrition was reinforced by a Norwegian cohort reporting that **maternal intake of selenium was significantly associated with prolonged gestational length (β per SD = 0.25, 95% CI, 0.07, 0.43) and lower risk of preterm delivery ($n = 3618$, hazard ratio per SD = 0.92, 95% CI, 0.87, 0.98)⁴.**

Omega-3 fatty acids and their role in preterm delivery have been studied over decades⁵. Women supplemented with 600 mg algae oil DHA daily during the last half of pregnancy had fewer infants born early preterm, < 34 weeks, when compared with control group (DHA $n = 178$; control $n = 172$; $p = 0.025$)⁵. Inconclusive findings were observed, and no significant influence was shown in a trial investigating 900 mg fish oil omega-3 fatty acids daily from < 20 to 34 weeks of gestation or delivery ($n = 5486$ pregnancies)⁶. In an analysis of 184 countries published in 2019, **preterm birth rate declined linearly with increasing omega-3 levels up to ~600 mg per day** and the number of preterm cases per 100 live births decreased by 1.5 (95% CI, 2.8 to 0.3) for each 1 SD increase in daily omega-3 consumption norms (383 mg/day)⁷.

Imbalanced dietary status is common³ and it has been reported that only 55% women changed their diet during gestation in a cohort of well-educated pregnant women⁸. **Healthcare professionals, a main information source for women about preterm birth and recommendations on dietary supplements during pregnancy⁸, are key to increase preterm and nutrition awareness among women for healthy future generations.**

How much DHA we should consume?	
Chines DRIs 2013 ⁹	
Life Stages	DHA (mg/day)
0 to < 4 years	100
4 to 80 years	Not Determined
Pregnant women	200
Lactating women	200
Remarks: WHO advises adults should consume 250 mg of DHA and EPA daily¹⁰ An expert group stated that <u>higher daily DHA intake (600 - 800 mg) during pregnancy may provide greater protection against early preterm birth¹¹</u>	



References: 1. Hanson MA et al. Int J Gynaecol Obstet. 2015;131 Suppl 4:S213-S253. 2. Loy SL et al. Clin Nutr. 2019; pii:S0261-5614(19)33030-4. 3. Zhang Y et al. Nutrients. 2017;9(3). 4. Barman M et al. Br J Nutr. 2019;1-11. 5. Carlson SE et al. Am J Clin Nutr. 2013;(4):808 - 815. 6. Carlson SE et al. Am J Clin Nutr. 2013;97(4):808-815. 7. Makrides M et al. N Engl J Med. 2019;381(11):1035-1045. 8. Ciesielski TH et al. BMJ Open. 2019;9(4):e027249. 9. Chinese Nutrition Society. Chinese dietary reference intakes 2013 - Summary. 2017. 10. FAO/WHO. FAO Food and Nutrition Paper 91. Fats and fatty acids in human nutrition - Report of an expert consultation. Geneva, November 2008. 11. Koletzko B et al. Ann Nutr Metab. 2014;65(1):49-80.

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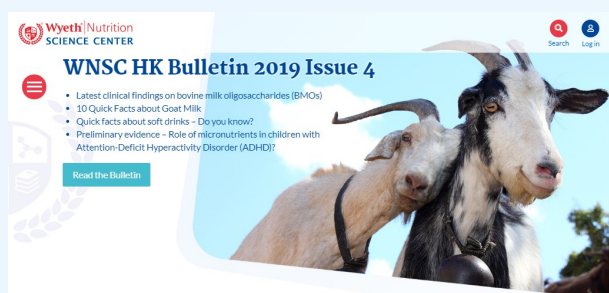
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IMPORTANT NOTICE: Breastfeeding is the best way of feeding a baby during the first 6 months of life and is preferred whenever possible. Infant formula for special medical purposes must be used under medical supervision, after full consideration of all feeding options, including breastfeeding. Continued use of an infant formula for special medical purposes should be assessed on a case-by-case basis in relation to the baby's progress, and bearing in mind any social and financial implications for the family.

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MONTHLY HEALTH FOCUS

Optimising nutritional assessment for children — A glance beyond the plate

Kelly Ching Registered Dietitian (CDR, USA), BSc

A healthy, well-balanced diet is integral to overall health and wellness, and this is particularly true in the context of pediatric care. For decades, meta-analyses and systematic reviews have outlined the role of early life nutrition in immune system development¹ and gut microbial composition and functions², etc. While dietary recalls remain to be the core of nutritional assessment³, recent data has begun to recognize more potential factors contributing to a child's diet quality:

Sleep duration⁴

In a 2013 study with 62,517 school-aged children in China, **short sleep duration (< 7 hours) was independently associated with increased intake of sugary beverage (OR = 1.29, 95% CI = 1.19 - 1.40), decreased intake of vegetables (OR = 0.94, 95% CI = 0.90 - 0.98) and fruits (OR = 0.94, 95% CI = 0.88 - 0.99).**

Screen time and cooking shows^{5,6}

While one Japanese study revealed the association of long TV viewing times with lower intake of nutrients such as protein, calcium, iron, vitamin K for boys and protein, calcium, vitamin D for girls, another study conducted in the Netherlands found that children who watched cooking programs with healthy foods (e.g. fresh fruits and vegetables) were more likely to choose healthy foods when compared to counter groups who watched program with unhealthy foods (e.g. hamburger, french fries, and croissants), or no programs at all.

Nutrition knowledge of child and guardian⁷

Another cross-sectional study in Japan involving primary school children and their guardians concluded that higher nutrition knowledge of the children was significantly associated with higher vegetable intake ($p = 0.024$ for boys and < 0.0001 and for girls in lower grades, < 0.0001 for boys and < 0.020 for girls in higher grades). Meanwhile, higher nutrition knowledge of the guardians was also associated with higher vegetable intake, except for boys in higher grades.

Active play and connection with nature⁸

In 2017, the University of Hong Kong published an article on a pilot project recruiting thirty-eight groups of preschoolers, mothers, and domestic helpers to attend a weekly program involving diet education, food games, and outdoor activities for 4 months. Feeding practices showed improvement after the intervention particularly for encouragement to eat and instrumental feeding ($p = 0.008$ and $p = 0.016$). **Of note, the responsibility of domestic helper in cooking/feeding the child was shown to predict picky eating behaviors ($p = 0.021$) while cooking/feeding by both mother and helper could predict child's consumption of salty foods ($p = 0.007$).**

The above indicates certain degrees of demand in broadening the scope of nutritional assessment in both in-patient and outpatient settings. With future research to validate, the modification of current dietary assessment methods and tools may lead way to a more effective nutrition care process for the pediatric population.



All about iron

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Iron is essential to synthesize hemoglobin that carries oxygen around our bodies^{1,2}. Optimal iron status contributes to a healthy immune system and biochemical reactions for energy supply^{1,2}. Sharing here some quick facts about iron:

Iron and Cognition – What's New?

In a Canadian Cohort of young children aged 1 - 3 years ($n = 130$)³,

- **Higher serum ferritin levels were associated with higher cognitive function** as indicated by the Early Learning Composite (ELC)
- A serum ferritin level of 17 $\mu\text{g/L}$ corresponded to the maximum ELC level. Below this maximum level,
 - ◊ A 5-unit serum ferritin increase (6 - 11 $\mu\text{g/L}$) was associated with an ELC increase of 4.0 units (95% CI 0.4 - 7.6)
- No meaningful improvement was noted beyond the maximum ELC level

Iron status of Hong Kong populations

Preschooler (30 - 60 months)

- In a local report in 2017⁴,
 - ◊ Mean intake of iron was at 93% of adequate intake (AI) which is lower than the recommended level of 12 mg/day (AI) set by the Chinese Nutrition Society ($n = 302$; $p < 0.001$)

Adults

- In the First Hong Kong Total Diet Study⁵,
 - ◊ Iron intake of > 80% men was below the recommended level of 12 mg/day (AI) set by the Chinese Nutrition Society
 - ◊ **Iron intake of > 90% women was below the recommended level** (20 mg/day for women aged 18 - 49 years and 12 mg/day for women aged ≥ 50 years)

Tips to get more iron from diet^{1,2,7}

- Choose more dark green vegetables, dried beans and nuts
- Eat meat and vegetables at the same time
- Eat vitamin C-containing foods like fruits and vegetables at meal times
- Add dried fruits to desserts and have fruits and/or nuts as snacks between meals
- Enjoy coffee or tea at least 1 hour before or after a meal
- Replace salad dressing with vitamin C-rich lemon juice, lime juice or iron-rich hummus

People at risks of iron deficiency^{1,2}

Adolescent girls, athletes, frequent blood donors, **infants and toddlers**, people with gastrointestinal conditions (e.g. Coeliac disease, Crohns Disease/Ulcerative Colitis), **pregnant women and women after childbirth**, women with heavy menstrual periods

Food choices rich in iron (iron level/quantity of cooked food)²

Animal-based foods

- Clam: 28 mg/100 g
- Beef (lean): 1.7 - 3.7 mg/100 g
- Chicken leg: 1.3 - 1.4 mg/100 g
- Pork (lean): 0.6 - 1.9 mg/100 g
- Egg: 0.7 - 1.0 mg/1 egg (60 g)
- Salmon: 0.3 - 1.3 mg/100 g

Plant-based foods

- Wood ear fungus (soaked*): 4.4 mg/~80 g
* By soaking 10 g of dried fungus
- Edamame: 4.4/160 g
- Lentils: 2.0 - 3.3 mg/99 g
- Bok Choi: 1.6 - 3.4 mg/160 g
- Spinach: 3.2 - 6.2 mg/160 g
- Sesame (black): 2 mg/1 tablespoon (9 g)

Let's try some healthy high iron options today to get more iron^{1,2}:



- Sir-fried chicken with honey peas and wood ear fungus
 - Clam and udon in soup served with edamame
- Avocado, poached eggs, baby spinach and lime juice on toast

Check out the WNSC HK Health Eating Tips Cards for MORE NUTRITION TIPS!

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Spring fruits and vegetables

Kelly Ching Registered Dietitian (CDR, USA), BSc

Spring is finally in the air! Check out the nutritional profiles of these seasonal fruits and vegetables!^{1,2}



Tomato, raw (per 100 g)³

- Energy: 18 kcal
- Protein: 0.88 g
- Dietary fiber: 1.2 g
- Good source of potassium, folate, vitamins A, C and E
- Cooking tomatoes with olive oil increases the absorption⁴ of its **lycopene, a carotenoid associated with reduced risk of prostate cancer and cardiovascular diseases**^{5,6}

Spinach, raw (per 100 g)⁷

- Energy: 23 kcal
- Protein: 2.86 g
- Dietary fiber: 2.2 g
- Good source of iron, folate, vitamins A, C and K
- Long-term daily oral supplementation of spinach (at 1 g/kg body weight) was clinically shown to **improve oxidative stress markers and muscle damages** in well-trained healthy young male athletes post-half-marathon⁸



Beetroot, raw (per 100 g)⁹

- Energy: 43 kcal
- Protein: 1.61 g
- Dietary fiber: 2.8 g
- Good source of folate, potassium and manganese
- A single dose of beetroot juice (140 ml) was clinically shown to **improve macrovascular endothelial functions** in pregnant women¹⁰

Loquat, raw (per 100 g)¹¹

- Energy: 47 kcal
- Protein: 0.43 g
- Dietary fiber: 1.7 g
- Good source of vitamin A
- Contains monounsaturated and polyunsaturated fatty acids
- Phenolic compounds in loquats may have **anti-inflammatory** and **anti-oxidative** effects¹²



Dragon fruit, red (per 100 g)¹³

- Energy: 60 kcal
- Protein: 1.18 g
- Dietary fiber: 2.9 g
- Good source of calcium and magnesium
- Red dragon fruit extract was clinically shown to decrease cell proliferation and induced apoptosis in breast cancer cell lines¹⁴

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WNSC HK Expert Interview with Prof. Liam O'Mahony

The Latest Evidence Linking Early Nutrition and Childhood Allergy Outcomes

- Linkage between diet, microbiome, metabolism and immune development
- Role of human milk oligosaccharides, probiotics and other diet components in allergy pathophysiology
- Role of diet diversity in protecting against allergies
- Practical tips for optimising the lifelong health of infants



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