

Babyfeeding Focus

Infant Nutrition Issues for Health Professionals

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Vitamin D - do we get enough in winter?

The short answer is no. From May to October most of us have a suboptimal vitamin D status. And that includes vulnerable groups such as pregnant women, infants and children, especially those who are dark-skinned or cover their skin throughout the year, regardless of season.^{1,3}

Why?

New Zealand's latitude, our well adhered-to sun-smart messages, significant population with dark skin pigmentation, and limited food fortification with no routine supplementation, are all key contributors to the problem.

Should we be concerned?

Vitamin D deficiency (ie, having blood vitamin D levels less than 17.5nmol/L) has long been a concern for the development of rickets in infants and children. However now studies suggest an association between vitamin D insufficiency (levels less than 50nmol/L) and a range of other conditions, including cardiovascular disease, colorectal cancer, diabetes and infection.^{4,7} Controlled trials are currently underway to determine whether vitamin D has a direct effect on these conditions or not.

What the research says

Blood vitamin D levels in New Zealand children, adolescents and adults peak in March and are at their lowest in August.^{1,2}

Women: Research on pregnant women in Wellington showed all Middle Eastern and Indian women screened had vitamin D insufficiency, along with most Maori, African and European women.⁸ The majority of South Asian women from Auckland screened for vitamin D levels were also found to have insufficient levels.⁹

Infants: As part of the New Zealand Asthma and Allergy Study, more than half of the newborn infants screened (using cord blood) were vitamin D insufficient and a significant proportion were vitamin D deficient. Less than one third had levels associated with optimal health (levels of 75nmol/l or higher). Pacific infants were more likely to have low levels which did not change seasonally. Levels in Maori infants varied slightly with seasons, while those in European newborns varied the most with seasons.¹⁰ Cord blood level in newborns is mainly determined by maternal vitamin D status, but after following up the same children at age 5, higher levels of cord blood vitamin D also correlated with lower risk of respiratory infections and childhood wheezing.¹¹



Children: In Dunedin the majority of children aged 12-22 months measured for vitamin D status in winter were found to have insufficient levels, while in summer the opposite was true. This study also showed breastfeeding and higher levels of education to be independently associated with lower blood vitamin D concentrations.¹² In Auckland year-round, up to two thirds of children (aged 6-23 months), measured from a wide range of ethnicities, were vitamin D insufficient.¹³

So what can we do to improve our vitamin D levels in winter?

Because our diet is not a good natural source of vitamin D, options include supplements or fortified foods. These have been shown to improve vitamin D status overseas.¹⁴

In New Zealand since 1996, voluntary vitamin D fortification of margarine and dairy foods at low levels has been permitted. In Europe, Canada and the US, vitamin D is permitted to fortify a range of foods such as milk, margarine, breakfast cereals, pastries, breads, which are consequently key sources of vitamin D.¹⁵

Current fortification of food in New Zealand does not stop the seasonal decline in vitamin D over winter. One study recently showed that daily consumption of fortified milk for 12 weeks can increase blood vitamin D levels in women, but not prevent the seasonal decline in blood vitamin D.¹⁶ Therefore it's been suggested that a wider range of foods may require fortification, to a greater level, in order to allow for New Zealanders' seasonal changes in sunlight exposure.

Key points¹⁷

- Enjoy outdoor activities with the family – especially in the winter (and at either end of the day in summer). Sunburn should always be avoided.
- Eat foods containing vitamin D (eg, eggs, milk and milk products and oily fish such as salmon, tuna, sardines, eel and warehou) on a regular basis – especially in winter.
- Choose vitamin D fortified food products where available (eg, spreads, specific milks and yoghurts). Check the label to be sure.
- Dark skinned people do not have the same sun-smart requirements as light-skinned people because darker skin produces less vitamin D from sunlight. It is therefore not possible to provide a single guideline on sun exposure for everyone, other than sunburn should be avoided.
- Talk to your GP, dietitian or LMC if you think you may need a vitamin D tablet.

Did you know?

Most vitamin D comes from the action of the sun on our skin. The amount of sun you need to make enough vitamin D depends on factors such as your skin colour, age, dietary intake of vitamin D, season, time of day and geographical location. The Ministry of Health and the Cancer Society are presently developing guidelines on safe sun exposure to allow for all of these factors.

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Encouraging healthy eating behaviour

First results from the NOURISH study

Food preferences and poor eating patterns are established from as early as 6 months of age and may stay with us into childhood,^{1,2} and possibly into adulthood. The risk of developing obesity in later childhood is influenced by the quality of the infant and toddler diet (independent of breast feeding)^{3,4} and the rate of weight gain prior to 2 years of age.⁵ Parenting style and early feeding practices are known to influence eating habits in infancy and childhood and therefore are an important focus for prevention of obesity and related chronic disease.^{6,7} Infant feeding practices 'programme' our taste preferences, tolerance of different textures and appetite,⁸ so infancy is a critical period for the foundation of life-long healthy eating patterns. This is the rationale for research designed to promote healthy eating habits in infancy for the prevention of childhood obesity. The NOURISH⁹ early feeding trial is one such intervention, designed to fill a major gap in this area of research¹⁰, while there are several other studies currently underway in New Zealand. The NOURISH trial is taking place in Brisbane and Adelaide.

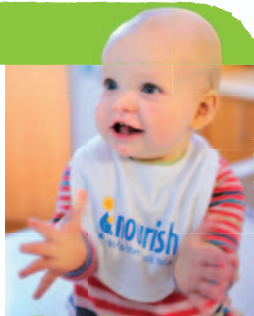
The NOURISH trial is a randomised controlled trial with 698 first-time mothers and their babies, evaluating a novel early feeding intervention. The study began when infants were four to seven months of age and emphasises healthy eating, feeding relationships and healthy growth, rather than obesity prevention. The first phase of intervention, delivered in group sessions over six fortnights focused on establishing complementary feeding (foods in addition to breast milk or formula), including variety and texture, neutral repeated exposure to healthy foods, neutral limited exposure to less healthy foods and having realistic expectations of the growth and nutritional requirements of healthy infants. This aimed to develop healthy child food preferences and was called: 'children learning to like; liking to eat'.¹¹

Initial results from the first intervention phase showed promising effects on infant growth and maternal feeding behaviours. Children from the intervention group had significantly lower BMI and weight increases, while maintaining normal growth. This is important because both high BMI and excessive weight gain are key risk factors for childhood obesity.⁵

The second intervention phase, undertaken at 14 months, focused on development of a positive feeding environment and managing toddler eating behaviour in the context of increasing autonomy and transition to eating with the family and beyond. It encouraged a structured food choice and eating pattern and positive role modelling, while avoiding coercion, use of

Key points

- Recognising and responding to your infant's own signs of hunger and feelings of fullness, when complementary foods are first introduced can have a beneficial effect on both BMI and weight gain into the second year of life.



rewards and emotional feeding. This aimed to foster trust in the child's ability to regulate intake through recognising and responding to child signals of hunger and satiety and was called: 'parent provide; child decide'.¹²

NOURISH researchers are currently completing final outcome measures on the children at two years of age, including growth, maternal feeding practices and child feeding behaviour and intake. Also several spin off studies are underway, investigating the role of fathers in early feeding, feeding practices of Chinese and Indian immigrant mothers and the impact of maternal obesity and weight gain during pregnancy on infant feeding outcomes. We hope to bring these results to you when they are available.

This study is partly supported by the Heinz Post-doctoral Fellow position at Queensland University of Technology.

Ask a dietitian

Q. I read in a book that my baby can't digest starchy foods until he is around a year old. My baby is 6 months old and has started solids, does this mean I can't offer foods like baby cereals, rice and bread until he's one year old?

A. Foods containing starch are an important part of an infant's diet once they start solids. Babies start producing amylase – the enzyme the body uses to digest starch – between the age of four and six months, so it is appropriate to introduce baby cereals, rice, bread and potato from this age.

For more advice on infant and toddler nutrition please contact our Forbaby Nutrition Advisory service on our Careline 0800 55 66 66



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Now available in a convenient resealable pouch.

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