

# Vitamin D –raising awareness of low intakes

**Angie Jefferson**  
Registered Dietitian

## Public Health Challenge

Living in a world where nutrient excess is the norm, it may come as a surprise to discover that a serious public health problem challenging the UK is that of poor vitamin D status. Sub-optimal vitamin D status is prevalent among all age groups in UK<sup>1,2</sup>. In fact, in 2012, the UK's Chief Medical Officers warned that up to one quarter of the UK's total population have low levels of vitamin D in their blood<sup>3</sup>, making poor vitamin D status one of the UK's most pressing dietary challenges.

Previously endogenous production of vitamin D by the skin was thought to cover a large part of daily needs<sup>2</sup>. However, a combination of less time spent outdoors and the increasing use of sun creams means sufficient endogenous production cannot be assumed<sup>4</sup>. The UK's northerly latitude also means that the production of vitamin D from the action of sunlight on the skin is severely compromised<sup>2</sup>. Vitamin D is found naturally in only a limited number of foods (e.g. oily fish and liver), so for most people consumption of foods fortified with vitamin D (such as breakfast cereals and spreads) is the only route to increased dietary intake.

Vitamin D, strictly speaking isn't a vitamin, but is in fact a pro-hormone, helping to increase the body's ability to absorb calcium (between 30-80%<sup>5</sup>) and phosphorous during digestion, and to optimise mineralisation of bones and teeth. Low levels of vitamin D are linked to bone disorders, including rickets in children and adolescents, and osteomalacia in adults, along with other conditions such as osteoporosis due to the effect vitamin D has on calcium absorption<sup>2</sup>. The relationship between vitamin D and bone health is sufficiently strong for the European Commission to have approved a health claim on this - "Vitamin D contributes to the maintenance of normal bones"<sup>6</sup>.

Recent years have seen the re-emergence of rickets (a severe form of vitamin D deficiency causing deformity of the bones) amongst children in the UK, a condition believed to have been eradicated at the end of the Second World War. Half of the UK's white population, around 90% of the multi-ethnic population, and a

quarter of children are deficient in vitamin D, increasing their risk of osteoporosis<sup>2</sup>. The number of osteoporosis sufferers is increasing rapidly as the UK population ages, representing a huge economic burden on society (at present the cost of osteoporotic hip fractures to the NHS is estimated to be £2 billion per year)<sup>7</sup>.

**"Children and teenagers in the UK currently consume only one quarter of the recommended intake of Vitamin D and need to quadruple vitamin D intake from foods and/or supplements."**

## Current Intakes & Recommendations

The current recommended intake for vitamin D (currently under review) varies with age: 7-8.5µg/day between 0-3 years, 10µg/day for pregnant and lactating women and older adults >65 years, with no RNI for those aged 4-64 years<sup>8</sup>. The Department of Health advises that all young children aged between six months - five years be given a daily supplement of vitamin D containing 7-8.5µg vitamin D, to help them meet requirements<sup>3</sup>. The only exception is formula fed infants consuming in excess of 500mls formula daily. In addition, all pregnant and lactating women, and those aged over 65 years should take a daily 10µg vitamin D supplement.

Average intakes of vitamin D are low at just 1.9µg/d for children aged 4-10 years, 2.1µg/d for teenagers, 2.8µg/d for adults aged 19 to 64 years and 3.4µg/d for adults over 65 years<sup>9</sup>. Children and teenagers in the UK consume on average just one quarter of the vitamin D that they need from dietary sources.

Few Britons choose to eat oily fish<sup>9</sup>. Eating foods fortified with vitamin D regularly can help to boost vitamin D status<sup>10</sup>. Fortified breakfast cereals make a valuable contribution to vitamin D and other micronutrient intakes, particularly for those living in economically challenged households<sup>11</sup>. In the UK, fortified breakfast cereals contribute 13% of average daily vitamin D intakes in men and women<sup>12</sup> and 23% of average daily vitamin D intake among 4-18 year olds<sup>13</sup>. In addition, most breakfast cereals are consumed with milk, providing the ideal partnership of vitamin D and calcium<sup>14</sup>. Table 1 shows the vitamin D content of common dietary sources.

### Tips to Increase Vitamin D Status

- ✓ Aim to consume at least two portions of fish each week, one of which should be oily<sup>15</sup>
- ✓ Choose breakfast cereals fortified with vitamin D
- ✓ Advise on use of supplements according to Department of Health Recommendations

### Conclusion

Evidence of the extent of sub-optimal vitamin D status among both children and adults in the UK is concerning. The challenge for all health care professionals is to raise awareness of the vital role of vitamin D and encourage the consumption of a wider range of foods containing either natural vitamin D or those that have been

fortified. Foods naturally rich in vitamin D (e.g. oily fish) are not the first choice for many in the UK population. However, breakfast cereals are popular and something as simple as choosing those fortified with vitamin D, and encouraging their consumption at least once daily, could significantly boost vitamin D intakes.

Table 1: Dietary Sources of Vitamin D

	Vitamin D per 100g	Vitamin D per typical portion	% recommended	Portion size
<b>Mackerel</b>	8.8µg	7.04µg	140%	80g
<b>Pilchards canned in tomato sauce</b>	14.0µg	7.0µg	140%	50g
<b>Salmon (steamed)</b>	7.1µg	5.7µg	114%	80g
<b>Tuna (canned)</b>	3.0µg	2.8µg	56%	92g
<b>Egg Poached</b>	0.9µg	1.8µg	36%	2 medium eggs
<b>Kellogg's children's cereals (Corn Flakes, Rice Krispies, Choco's, Smacks etc.)</b>	4.2µg	1.3µg	26%	30g bowl
<b>Cheddar Cheese</b>	0.3µg	0.14µg	3%	45g

Source: McCance & Widdowson Composition of Foods 6th edition

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