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VITAMIN D RECOMMENDATIONS FOR EUROPE AND THE UK

Vitamin D recommendations for both Europe and the UK were updated in 2016. The Scientific Advisory Committee on Nutrition (SACN) released its updated vitamin D and health report to establish whether the existing UK dietary recommendations from 1991 were still applicable to today's population.[1]

The European Food Safety Authority (EFSA) also produced dietary reference values for vitamin D for.[2] The updated recommendations for both SACN and EFSA reference incorporates all dietary sources of vitamin D including natural food sources, fortified foods such as infant formula milk and dietary supplements.

When comparing vitamin D recommendations between SACN, EFSA, or any other international governing body, it is important to consider any assumptions behind the evidence included or excluded during their analysis. SACN produced safe intakes (SI) and reference nutrient intake (RNI) values for vitamin D, while EFSA concluded that there was insufficient evidence to define reference nutrient intakes and produced adequate intakes (AI) of vitamin D for various age groups within the population. The EFSA tolerable upper limits[4] for vitamin D were established in 2012, four years prior to the release of the DRVs. It will be interesting to see whether these are values change when next reviewed.

The dietary reference values (DRVs) for vitamin D produced by SACN and EFSA are not directly comparable. Despite having an overlapping pool of evidence to form their guidance, both bodies produced different recommendations for dietary vitamin D, based upon how they graded the evidence, thresholds chosen and health outcomes measured. The EFSA assessment took place between 2013-2016, with SACN evaluating the evidence assessed in its report between 2011-2016.[3] Neither SACN or EFSA took

Table 1: Vitamin D recommendations and tolerable upper limits

Age group	SACN vitamin D recommendations for the UK population (2016)1	EFSA recommendations for the EU population (2016)2	EFSA Tolerable Upper Limits (2012)[4]
Infants birth to 6 months	8.5-10µg (SI)	-	25µg
Infants 7 to 11 months	8.5-10µg (SI)	15µg (AI)	25µg
1 to 4 years	10µg (SI)	15µg (AI)	50µg
5 to 11 years	10µg (RNI)	15µg (AI)	50µg
12-17 years	10µg (RNI)	15µg (AI)	100µg
18 years +	10µg (RNI)	15µg (AI)	100µg
Pregnant and lactating women	10µg (RNI)	15µg (AI)	100µg

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into account vitamin D synthesis from exposure to sunshine and both considered serum 25(OH) D to be the best indicator of skin synthesis and dietary intake.

The EFSA panel established that the majority of the adult population would achieve serum 25-hydroxyvitamin D (25(OH)D) concentrations near or above the target of 50nmol/L when consuming an adequate intake (AI) of 15μg.[2] However, SACN decided that serum 25(OH)D concentrations of 25nmol/L was an appropriate reference value to minimise the event of negative musculoskeletal health outcomes for 97.5% of the population.

A meta-analysis of data used by EFSA to determine adequate intakes was conducted under conditions where there was assumed minimal subcutaneous vitamin D synthesis, thus assuming that all vitamin D would be required through the diet. EFSA states that 'true' adequate intake values of dietary vitamin D may be lower than those set, perhaps even zero, in the presence of adequate sunlight exposure for vitamin D production.

RECOMMENDATIONS FOR INFANTS

A notable difference between the approach used to set DRVs between EFSA and SACN is demonstrated in infants. EFSA did not set an AI for infants from birth to six months due to the lack of research conducted on this population, particularly in breastfed infants. Most research within this age group is conducted on formula-fed infants using formula and/or foods that have been fortified by vitamin D. This made it difficult to form a conclusive evidence-based recommendation about how much this age group actually requires. SACN, however, decided upon a safe intake of 8.5-10μg for the same age group as a precautionary value, based on current intakes and current practice to reflect insecurities and lack of data within this age group.

The influence that a threshold for vitamin D has on requirements was demonstrated in a recent study in UK adolescents.[6] An intake of 10-30μg was found necessary to maintain blood serum 25(OH)D concentrations over 25nmol/L or 50nmol/L, depending on which threshold was chosen.

The most recent NDNS survey found an increased risk of vitamin D deficiency based upon serum vitamin 25(OH)D concentrations below 25nmol/L across all age groups, ranging from 7.5% in children to 24% in girls and women.[7] Dietary intakes of vitamin D met 27% of the previous RNI for children aged 1-3 and 33% for adults 65 and older of 10μg[6]. Supplemental vitamin D increased this proportion, but not substantially enough to meet the RNI. Meat and meat products, milk and milk products, fortified

Table 2: Converting vitamin D between micrograms (µg) and International Units (IU)

micrograms (µg)	International Units (IU)
10µg	400IU
15µg	600IU
20µg	800IU
25µg	1,000IU
50µg	2,000IU

fat spreads and fortified cereal products were the main contributors of dietary vitamin D.[7]

A recently published study comparing the different practices and knowledge of white Caucasian and South Asian living in Manchester, indicated the importance of cultural beliefs and advice tailored to suit.[8] Those from South Asian backgrounds had a greater understanding of the importance of vitamin D for bone health and that it could be obtained from sunlight, than white Caucasian groups. Despite this knowledge, few within this population group used vitamin D supplements.

PRACTICAL MESSAGES REGARDING VITAMIN D

When recommending vitamin D intakes for a population, it is important to consider the approaches used to set a dietary reference value, whether it is based upon evidence or current intakes in the absence of any research.

From a dietary perspective, when exposed to sunlight or UV lamps, mushrooms have the magical ability to synthesise vitamin D. Vitamin D rich mushrooms are becoming more common in mainstream supermarkets. As a fat soluble vitamin, absorption of vitamin D in mushrooms can be enhanced by cooking them with a little extra virgin olive oil. Egg yolks are a good dietary source of vitamin D, but recent health scare-mongering has resulted in many individuals shying away from eating eggs regularly. Oily fish and cod liver oil contain vitamin D; however, these do not feature heavily in today's western diets. Providing clients and patients with suggestions on how to prepare these foods in palatable ways and incorporate them into their diets on a regular basis can help to increase their dietary vitamin D intake.

With regards to supplements, some declare vitamin D content in International Units (IU) rather than micrograms (µg). Supplements can be a quick and convenient way to ensure that a consistent intake of vitamin D is achieved on a daily basis throughout the entire year. This is particularly important for individuals who don't get much sun exposure due to their environment or cultural beliefs. Education plays an important role in advising appropriate food sources of vitamin D, appropriate sun behaviour practices to enhance vitamin D synthesis and indicate whether an individual would benefit from taking a supplement.

References

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