

Norwegian analytical values for vitamin K₁ in selected vegetables and vegetable oils



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Background: Since 2001 vitamin K has been included in the core group of components to be analysed for the Norwegian food composition database.

Aim: To present values for vitamin K₁ (phylloquinone) in vegetable oils and selected vegetables analysed for the Norwegian Food Composition Table and compare the results with published values from other countries.

Method: The content of vitamin K₁ in raw broccoli and tomatoes was analysed in 2001-02 at the University of Maastricht, The Netherlands using an in-house validated HPLC method. In 2003-04 commonly used vegetable oils (eight varieties), frozen vegetables (broccoli, sugar snap peas, green peas, green beans, Brussels sprouts) and raw

small carrots were analysed at the National Institute of Nutrition and Seafood Research, Norway, using a validated HPLC method accredited in 2005.

The analysed food items were compared with similar foods from a Swedish vitamin K report¹, British values², and American values³. All referenced values are analysed by HPLC.

Results: For the majority of the food items, no large differences were seen between the Norwegian analytical values for vitamin K₁ and Swedish, British and American values (Table 1). However, for some food items such as frozen broccoli, peas and Brussels sprouts, the Norwegian values were lower than the basis of comparison.

Table 1: Analysed values for vitamin K₁ compared to other countries' food table values for similar foods.

Food item	Year of analysis	Number of analyzed (primary) samples	Norwegian analytical value, vitamin K ₁ , µg	Swedish report ¹ vitamin K ₁ , µg	GB 2002 ² vitamin K ₁ , µg	USDA, SR 20 ³ vitamin K ₁ , µg
Tomatoes, imported, raw	2001	5 (23)	5.0 (5.6-19)	6 ^b	6 ^b	7.9 ^b
Broccoli, national cultivation, raw	2001	5 (19)	196 (82-494)	205	-	-
Broccoli, imported, raw	2001	3 (15)	106 (68-172)	-	185 ^b	102 ^b
Broccoli, frozen	2004	1 (4) ^a	46	286	135 ^c	81.1
Peas, green/Petit pois, frozen	2004	1 (4) ^a	11	23	28.3 ^c	23.5
Green beans/French beans, frozen	2004	1 (4) ^a	38	43-53	7.8 ^c	12.7 ^c
Brussels sprouts, frozen	2004	1 (4) ^a	95	280	119 ^c	193 ^c
Carrots, small, crispy, raw (young)	2004	1 (4) ^a	6.9	5 ^b	9.2 ^e	9.4 ^f
Olive oil	2003	4 (20)	34.4 ^d (18.7-40)	49	57.5 ^b	60.2 ^b
Soya oil	2003	3 (14)	166.3 ^d (78.9-205)	-	131	184
Rapeseed oil	2003	2 (8)	63.9 ^d (60.5-68.2)	141	112.5	71.3
Corn oil	2003	1 (9)	3.1	3	3	1.9
Sunflower oil	2003	1 (8)	3.0	-	6.3	5.4
Peanut oil	2003	1 (10)	8.5	-	-	0.7

^a seasonal sampling, ^b unspecified, ^c frozen, boiled, ^d weighted mean, ^e young carrots, ^f baby carrots

Conclusion: For the majority of the food items, the comparison showed good agreement between Norwegian analysed vitamin K₁ values and other countries' vitamin K₁ values for similar foods. However, larger differences were seen for some of the analysed food items. These differences may be caused by regional differences in composition, differences in preparation methods, differences in the accuracy of the analytical methods or other factors. These findings highlight the importance of analysing national foods for use in national food composition tables. More analytical work is needed to establish a complete Norwegian Food composition database for vitamin K₁.

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References:

¹ National Food Administration/Livsmiddelsverket, K-vitamin i livsmedel. Rapport 4/98. (Vitamin K in food items. Report 4/98).

² Food Standard Agency (2002) McCance and Widdowson's The Composition of Foods, Sixth summary edition. Cambridge: Royal Society of Chemistry.

³ U.S. Dep. of Agriculture ARS. USDA National Nutrient Database for Standard Reference, Release 20. www.nal.usda.gov/fnic/foodcomp/search, 2007.



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