Effect of Substituting Borrowed Values for Vitamin K_1 with Analytical Data on Norwegian Oils

Jannicke Fredriksen[1], Aase Borgejordet[2], Anne Marte W Johansen[1], Astrid Nordbotten[2], Kathrin Gjerdevik[3], Kerstin Trygg[1], Linda Granlund[4], Elin B Loken[1].
[1]Department of Nutrition, University of Oslo, Norway (jannicke.fredriksen@medisin.uio.no), [2]Norwegian Food Safety Authority, Oslo, [3]National Institute of Nutrition and Seafood Research, Bergen, [4]Mills DA, Oslo, Norway.

Background and aims

Since 2002 vitamin K has been included in the core group of components to be analyzed for the Norwegian food composition database (FCDB). The aim of the present study was to compare estimated intake of vitamin K_1 from dietary fats using a provisional database (PD) with borrowed data to intake of vitamin K_1 estimated by an updated database (UD) which included values for oils analyzed in Norway.

Methods

The content of vitamin K_1 in commonly used vegetable oils (Table 1) was analyzed at the National Institute of Nutrition and Seafood Research in 2003 using an HPLC method accredited in 2005. Four or five samples of each type of oil (Table 1) with different best-before dates were collected from each of the main manufacturers.

Table 1: Analysis of vitamin K_1 in oils

Oil	Brands No.	Collected samples No.	Composite samples No.	Vitamin K_1, Mean[1] µg/100 g	Vitamin K_1, Range, µg/100 g
Olive	4	20	4	34	19-40
Soy	3	15	3	166	79-205
Rapeseed	2	8	2	64	60-68
Corn	2	9	1	3	NA
Sunflower	2	8	1	3	NA

[1]Weighted mean according to market shares
NA, not applicable

In the PD for vitamin K_1 established by one of the authors (AMWJ), values were mainly borrowed from Sweden, Finland, USA, and available literature. All margarines were assigned the same vitamin K_1 value borrowed form the Swedish FCDB. For mayonnaise and mayonnaise spreads, Swedish and Finish values were used. For the UD using the new analytical values, vitamin K_1 content was calculated for several margarines according to the kind of oil that the margarines were made from. Vitamin K_1 content of mayonnaise and mayonnaise spreads was also estimated based on the kind of oil used in the mayonnaise. The UD thus contained updated vitamin K_1 values for 32 (16%) of a total of 199 food items. A nationally representative food frequency survey among adults in 1997 (Norkost, n=2672) was used to estimate the intake of vitamin K_1 from dietary fats using both databases.

Results and conclusion

When some of the borrowed vitamin K_1 values in the PD were substituted with new nationally analyzed values for vitamin K_1 for oils, intake of vitamin K_1 from dietary fats increased 6.2 µg/day (37%) (Table 2). Total intake of vitamin K_1 was 14% higher using the UD compared to the PD. These results highlight the importance of analyzing local foods when estimating the intake of vitamin K_1. More analytical work is needed to establish a Norwegian FCDB for this vitamin.

Table 2: Mean intake of vitamin K_1 from dietary fats (n=2672)

	PD	UD	P value[2]
Intake of vitamin K_1 from fats[1], µg/day	17	23	<0.001
Intake of vitamin K_1 from fats[1], % of total vitamin K_1 intake	29	35	<0.001
Total vitamin K_1 intake, µg/day	57	66	<0.001

[1]Fats include butter, margarine, oil, mayonnaise and mayonnaise spreads
[2]T-test for related samples
PD, provisional database; UD, updated database

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