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Supplementary Table 1. Estimated marginal means (95%CI) for the ratio of undercarboxylated osteocalcin to total osteocalcin (ucOC:tOC) for each quartile of Vitamin K1

intake.

ucOC:tOC ²	Quartiles for Vitamin K1 intake ¹				
	Quartile 1 <61.4 ug/d	Quartile 2 61.4 to <78.8 ug/d	Quartile 3 78.8 to <98.0 ug/d	Quartile 4 ≥98.0 ug/d	
Model 1	0.496 (0.487-0.506)	0.486 (0.479-0.493)	0.478 (0.471-0.485)*	0.463 (0.453-0.473)*	
Model 2	0.496 (0.486-0.506)	0.486 (0.479-0.493)	0.478 (0.472-0.485)*	0.464 (0.453-0.474)*	

¹Means and 95%CI obtained from a generalised linear model for the median values of Vitamin K1 intake within each Quartile (Q). ² Assessed in n=1188; Median intake Q1,

Q2, Q3 and Q4 for Vitamin K1 was 49.3, 70.1, 87.6 and 119.3 ug/d, respectively. * p<0.05 to Q1. Model 1: adjusted for age, treatment (calcium/placebo) and body mass

index. Model 2: Model 1 + smoking history, physical activity, calcium and alcohol intake.

Supplementary Table 2. Hazard ratios (95%CI) for any fracture and hip fracture-related hospitalizations over 14.5 years by quartiles of Vitamin K1 intake after adjusting for women with prevalent atherosclerotic vascular disease (ASVD) and diabetes at baseline.

	Quartiles of Vitamin K1 ⁻¹				
	Quartile 1 <61.2 ug/d	Quartile 2 61.2 to <78.7 ug/d	Quartile 3 78.7 to <99.2 ug/d	Quartile 4 ≥99.2 ug/d	
14.5 y any fracture-related hospitalization					
Events, n (%)	119 (34.6)	94 (27.6)	85 (24.5)	86 (25.2)	
Model 3	Ref.	0.75 (0.64-0.89)*	0.68 (0.55-0.84)*	0.68 (0.51-0.92)*	
14.5 y hip fracture-related hospitalization					
Events, n (%)	47 (13.7)	44 (12.9)	30 (8.6)	27 (7.9)	
Model 3	Ref.	0.76 (0.58-0.98)*	0.61 (0.43-0.89)*	0.51 (0.31-0.82)*	

¹Estimated hazard and 95%CI from Cox proportional hazards analysis comparing the median Vitamin K1 intake from each quartile (Q) compared to Q1. Median intake Q1,

Q2, Q3 and Q4 for Vitamin K1 was 49.3, 70.1, 87.6 and 119.5 ug/d, respectively. Model 3: adjusted for age, treatment, body mass index, smoking history, physical activity,

calcium, alcohol intake and prevalent osteoporotic fracture, 250HD and season (Winter/Spring, Summer/Autumn). *p<0.05 compared to Q1.

Supplementary Table 3. Hazard ratios (95%CI) for any fracture and hip fracture-related hospitalizations over 14.5 years by quartiles of Vitamin K1 intake after adjusting for diet quality using the Nutrient Rich Food Index (NRFI), standardised per 1000 kJ of energy intake.

	Quartiles of Vitamin K1 ⁻¹			
	Quartile 1 <61.2 ug/d	Quartile 2 61.2 to <78.7 ug/d	Quartile 3 78.7 to <99.2 ug/d	Quartile 4 ≥99.2 ug/d
14.5 y any fracture-related hospitalization				
Events, n (%)	119 (34.6)	94 (27.6)	85 (24.5)	86 (25.2)
Model 3 + NRFI	Ref.	0.75 (0.63-0.88)*	0.66 (0.53-0.83)*	0.65 (0.48-0.88)*
14.5 y hip fracture-related hospitalization				
Events, n (%)	47 (13.7)	44 (12.9)	30 (8.6)	27 (7.9)
Model 3 + NRFI	Ref.	0.75 (0.57-0.97)*	0.59 (0.41-0.86)*	0.47 (0.28-0.77)*

¹Estimated hazard and 95%CI from Cox proportional hazards analysis comparing the median Vitamin K1 intake from each quartile (Q) compared to Q1. Median intake Q1,

Q2, Q3 and Q4 for Vitamin K1 was 49.3, 70.1, 87.6 and 119.5 ug/d, respectively. Model 3: adjusted for age, treatment, body mass index, smoking history, physical activity,

calcium, alcohol intake and prevalent osteoporotic fracture, 250HD and season (Winter/Spring, Summer/Autumn). *p<0.05 compared to Q1.



Supplementary Figure 1. Participant flow chart.

*of these 1373 women, 102 did not have 250HD and 185 did not have the ratio of undercarboxylated osteocalcin to total osteocalcin assessed.



150

11

0

50

100

Vitamin k1 (ug/d)

undercarboxylated osteocalcin (ucOC) and carboxylated osteocalcin (cOC) obtained by generalized regression models in 1188 women. Shading represents 95% confidence intervals. The rug plot along the bottom of each graph depicts each observation. Multivariable-adjusted model included age, treatment (calcium/placebo) body mass index, smoking history, physical activity, calcium and alcohol intake.



Supplementary Figure 3. Scatterplot demonstrating the relationship between Vitamin K1 calculated primarily using the Australian vs. the United States Department of Agriculture (USDA) food database.



Supplementary Figure 4. Hazard ratios from Cox proportional hazards model with restricted cubic spline curves describing the association between Vitamin K1 and (A) any fracture-related hospitalization (B) hip fracture-related hospitalizations over 14.5 years after adjusting for women with prevalent atherosclerotic vascular disease and diabetes status. Hazard ratios are based on models adjusted age, treatment, BMI, smoking history, physical activity, calcium, alcohol intake, prevalent osteoporotic fracture, plasma 250HD and season. The hazard ratio compares the specific intake of Vitamin K1 (horizontal axis) to the median intake in the lowest quartile (49 ug/d). Shading represents 95% confidence regions. The rug plot along the bottom of each graph depicts each observation.



Supplementary Figure 5. Hazard ratios from Cox proportional hazards model with restricted cubic spline curves describing the association between Vitamin K1 and (A) any fracture-related hospitalization (B) hip fracture-related hospitalizations over 14.5 years whilst adjusting for diet quality using the Nutrient Rich Food Index (NRFI), standardised per 1000 kJ of energy intake. Hazard ratios are based on models adjusted age, treatment, BMI, smoking history, physical activity, calcium, alcohol intake, prevalent osteoporotic fracture, plasma 250HD, season, prevalent atherosclerotic vascular disease and diabetes status. The hazard ratio compares the specific intake of Vitamin K1 (horizontal axis) to the median intake in the lowest quartile (49 ug/d). Shading represents 95% confidence regions. The rug plot along the bottom of each graph depicts each observation.