Consumption of dairy products and cardiovascular disease risk: results from the French prospective cohort NutriNet-Santé

Article

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Appendix 1. Factor loadings from principal component analysis used to derive dietary patterns.

The principal component analysis creates linear combinations (called principal components) of the 20 food categories, with the aim to group together food categories that are correlated while explaining as much variation from the dataset as possible.

Food categories used for this principal component analysis were derived from the 58 foods groups defined in the French PNNS. Notably, the "Dairy products" category included milk, cheese, yogurt, cheese, curd-cheese, and "petit-suisses", whereas butter and dairy cream were included in the "Fats and sauces" categories [8].

The coefficients derived from the selected principal components are called factor loadings. A positive factor loading indicates a positive contribution of the food category to the principal component, whereas a negative factor loading indicates a negative contribution to the principal component. For the interpretation of the two principal components selected, we considered the food categories contributing the most to the component, i.e. with loading coefficients under -0.25 or over 0.25. We then label the principal components descriptively, based on the most contributing food categories. The healthy pattern (explaining 10.6% of the variance) was characterised by higher intakes of fruits, vegetables, soups and broths, unsweetened soft drinks, and whole grains, and lower sweetened soft drinks intake. The Western pattern (explaining 7.0% of the variance) was characterised by higher intakes of fat and sauces, alcohol, meat, and starchy foods.

Food categories	Factor loadings	
	Healthy Pattern	**Western Pattern**
Alcoholic drinks	-.09	**0.28**
Breakfast cereals	0.07	-.18
Cakes and biscuits	-.19	0.00
Dairy products	0.06	-.01
Eggs	0.07	0.04
Fats and sauces	0.01	**0.54**
Fish and seafood	0.20	0.10
Fruit	**0.35**	0.05
Meat	-.18	**0.31**
Pasta and rice	-.21	**0.34**
Potatoes and tubers	-.02	**0.40**
Poultry	-.03	0.06
Processed meat	-.22	0.20
Pulses	0.19	0.02
Soups and broths	**0.26**	0.22
Sugar and confectionery	-.08	0.12
Sweetened soft drinks	**-.28**	-.00
Unsweetened soft drinks	**0.25**	0.15
Vegetables	**0.47**	0.23
Whole grains	**0.38**	-.04

Appendix 2a. Consumption of dairy food in the NutriNet-Santé cohort, France, 2009-2019 (n=104,805).

Dairy food	Consumers (%)	Consumption (g/d)		Consumption in a representative French population (g/d) [a]	
		Mean	SD	Mean	SD
Milk	95.6	110	126.9	172.3	176.3
Cheese	94.8	37.7	28.3	38.5	30.4
Yogurts	79.2	79.1	84.9	76.7	78.7
High-fat	96.4	63.7	58	NA	
Reduced-fat	98.1	158.3	145.3	NA	
Fermented	97.9	117.5	87.3	NA	
Non-fermented	95.6	104.4	125.9	NA	
Total dairy	99.5	221.9	151.1	NA	

[a] As reported in the Third Individual and National Survey on Food consumption (INCA3) [9].

Appendix 2b. Contribution of dairy foods to key nutrient intakes in the NutriNet-Santé cohort, France, 2009-2019 (n=104,805).

Nutrient	Contribution from total dairy foods[a]				
	g/d		*% total nutrient*		*% total nutrient in the French population[b]*
	Mean	SD	Mean	SD	
Total fats	13.5	8.3	18.3	13.7	15.0
SFA	8.3	5.2	28.9	24.4	24.0
Protein	16.7	8.9	22.8	14.4	15.0
Sugars	9.9	7.7	12.4	12.3	10.0
Calcium	0.46	0.25	55.9	0.39	38.0
Iodine	36.4	22.0	29.0	25.1	20.0

[a] Values are presented as mean ± SD.

[b] As reported in the Third Individual and National Survey on Food consumption (INCA3) [9].

Appendix 3. Assessment of the proportional hazard assumption using the Schoenfeld residual method, NutriNet-Santé cohort, France, 2009-2019 (n=104,805).

The Schoenfeld residual method was used to test the proportional hazard assumption when performing Cox proportional hazard model [34]. The assumption is supported if there is no statistically significant correlation between the Schoenfeld residuals and time. P-values from Person correlations between the Schoenfeld residuals of each dairy food consumption in g/d and timescale (age, in years) are reported in the table below, and confirm that the proportional hazard assumption is verified.

Dairy food	p-value
Milk	0.33
Cheese	0.88
Yogurts	0.41
High-fat	0.53
Reduced-fat	0.12
Fermented	0.40
Non-fermented	0.35
Total dairy	0.21