Effect of dairy consumption on cognition in older adults in a population-based cohort

Natalia Ortega[1] [2], Armin von Gunten[3], Martin Preisig[4], Pedro Marqués-Vidal[5], Nicolas Rodondi[1,6], Arnaud Chiolero[2], Patricia O. Chocano-Bedoya[1]

[1] Bern Institute for Primary Health Care (BIHAM), University of Bern, 3012 Bern, Switzerland [2] Population Health Laboratory (#PopHealthLab), University of Fribourg, Fribourg, Switzerland [3] Service of Old Age Psychiatry, Department of Psychiatry, Lausanne University Hospital, University of Lausanne, Prilly, Switzerland [4] Department of Psychiatry, Lausanne University Hospital and University of Lausanne, Lausanne, Switzerland [5] Department of Medicine, Internal Medicine, Lausanne University Hospital, Lausanne, Switzerland [6] Department of General Internal Medicine, Inselspital University Hospital Bern, Bern, Switzerland

INTRODUCTION

- The relationship between dairy products intake and cognitive function in older adults remains controversial.
- Some dairy products could have an anti-inflammatory effect through short and middle chain fatty acids.

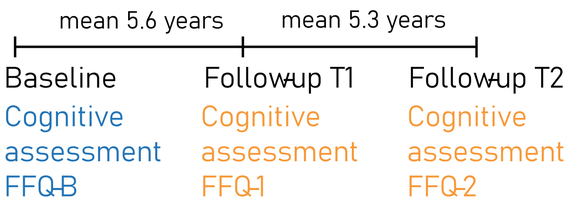
GOALS

Assess the effect of a) adding dairy to the baseline diet.
b) substituting other food groups by dairy on cognitive function in a population-based cohort.

METHODS

Study design and sample

- Secondary data analysis of a prospective cohort



Exposures (FFQ, gr/day)

- Total dairy products
- Fermented (cheese, yogurt)
- Non-fermented (milk, cream, butter)
- Full fat (regular milk, yogurt, cheese)
- Low fat (skimmed products)
- Sugary (icecream, flavoured yogurts)

Outcomes

- Clinical Dementia Rating
- Subjective Cognitive Decline
- Verbal fluency
- Stroop test
- DO40
- CERAD Praxis items
- Grobe & Bushcke test

Confounders

- Age
- Sex
- Smoking status
- Past major cardiovascular events
- Diabetes
- Depression diagnosis
- Family income
- Hypertension

Statistical analysis

- All-components models to compute both additive and substitution effects to compute the estimates and bootstrapped the CIs.
- Generalized additive models with flexible splines between age and cognitive function

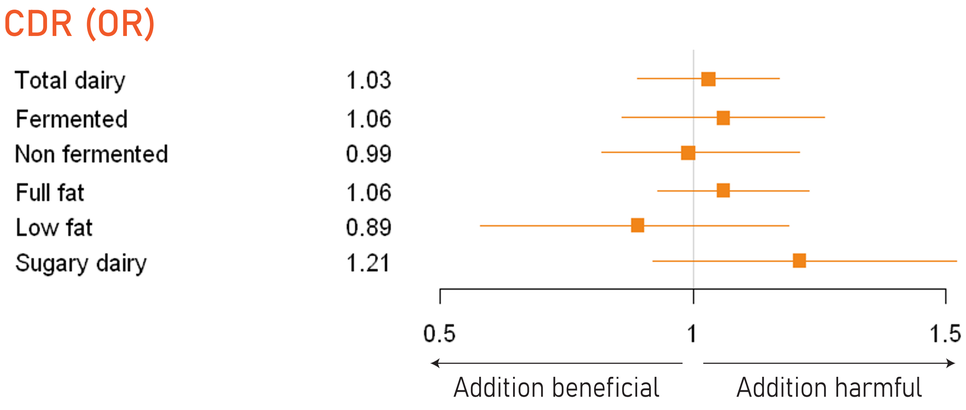
RESULTS

- 1,347 adults (61.7% females) with a mean follow-up of 5.6 years and a median age of 67 years at baseline.

ADDITION EFFECTS

Clinically irrelevant and inconsistent effects of **adding** dairy to the diet on cognition across outcomes - sugary products related with higher odds of very mild cognitive impairment.

CDR (OR)

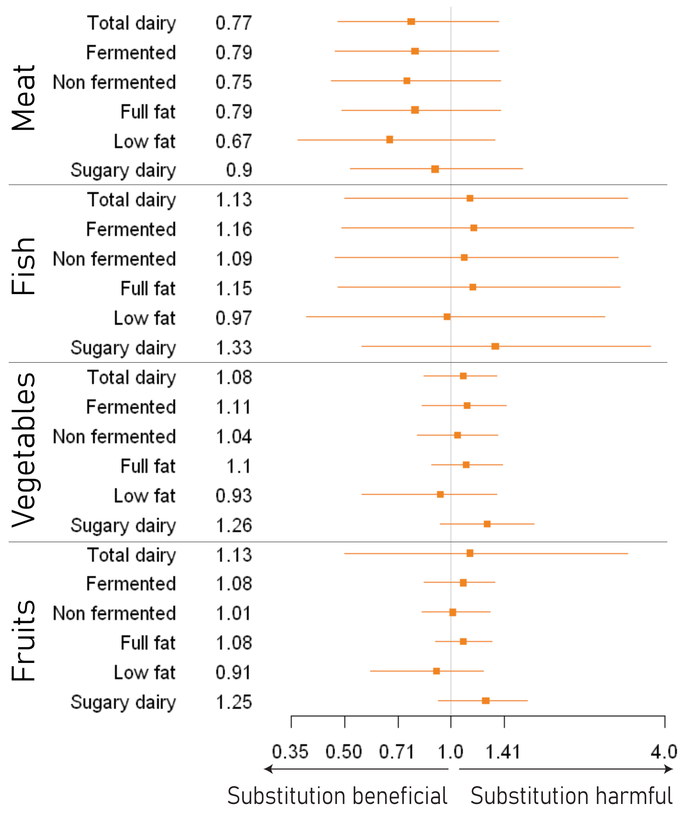


Change in outcome score

	Memory	Verbal fluency	Stroop	DO40	CERAD
Total dairy	0.003 (-0.002, 0.009)	0.005 (-0.04, 0.05)	0.0003 (-0.004, 0.004)	0.0008 (-0.007, 0.003)	-0.003 (-0.01, 0.004)
Fermented	0.006 (-0.004, 0.02)	0.002 (-0.06, 0.07)	-0.001 (-0.007, 0.004)	0.002 (0.0008, 0.005)	-0.006 (-0.02, 0.005)
Non fermented	-0.0003 (-0.009, 0.007)	0.009 (-0.06, 0.08)	0.002 (-0.002, 0.006)	-0.001 (-0.004, 0.0007)	0.0007 (-0.008, 0.009)
Full fat	0.003 (-0.004, 0.009)	0.01 (-0.04, 0.06)	0.0004 (-0.004, 0.004)	0.001 (-0.0004, 0.003)	-0.004 (-0.013, 0.02)
Low fat	0.004 (-0.02, 0.02)	-0.02 (-0.12, 0.11)	-0.00006 (-0.008, 0.006)	-0.0003 (-0.003, 0.003)	0.006 (-0.01, 0.02)
Sugary dairy	-0.003 (-0.03, 0.007)	0.008 (-0.07, 0.09)	-0.0002 (-0.007, 0.005)	0.002 (0.0007, 0.005)	-0.01 (-0.02, 0.004)

SUBSTITUTION EFFECTS

CDR (OR)



The **substitution** of meat by any type of dairy had a consistent positive effect across all the cognitive function outcomes (OR, score changes), but estimates were imprecise.

We did not find any other consistent effects for the other food groups.

The main limitations

- Lack of power to detect small effect sizes and small exposure range from some sub-types of dairy (e.g. low fat).
- Diet was only measured at one timepoint.
- Missing data for the different outcomes.
- Participants mostly healthy at follow-up.

Next steps

- Use data from international cohorts to increase the power and the exposure range.
- Implement more flexibility in the assumptions.
- Increase the range in the outcomes. Use the mini-mental state examination to compare our results with other studies.

CONCLUSION

Neither adding dairy to the diet nor substituting different food groups by dairy products affected cognitive function.

Further studies need to evaluate populations with wider range of exposure to dairy, a bigger sample size to increase our power to detect smaller effects and use other study designs to validate and confirm our results.

References

Preisig, M., et al. (2009). "The PsyCoLaus study: methodology and characteristics of the sample of a population-based survey on psychiatric disorders and their association with genetic and cardiovascular risk factors." BMC Psychiatry 9(1): 9

Tomova, G. D., et al. (2022). "Theory and performance of substitution models for estimating relative causal effects in nutritional epidemiology." Am J Clin Nutr 116(5): 1379-1388.

Natalia Ortega