Is the glass half empty or half full?
The associations between total, fermented and non-fermented dairy consumption and depressive symptoms among middle-aged Finnish men

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Introduction

- Depressive disorders have been associated with altered gut microbial composition (1); therefore, foods that favorably alter gut microbial composition may confer benefits for depression. (2)
- To date, evidence reporting associations between total dairy intake and depressive symptoms has been conflicting and inconsistent.
- However, few studies have considered unique associations between fermented and non-fermented dairy products and depressive symptoms.

Aim

1. To investigate cross-sectional associations between the consumption of total dairy, fermented dairy and non-fermented dairy with depressive symptoms in middle-aged Finnish men
2. To identify relevant cut-offs for fermented and non-fermented dairy products in relation to depressive symptoms

Fermented

Sour milk
Yoghurt
Buttermilk
Kefir
Quark
Cottage cheese
Fermented cheese

Non-Fermented

Milk
Powdered milk
Cream
Ice cream
Colostrum
Non-fermented cheese

Methods

Population

- We included 2603 men (aged 42-60yrs) who were part of the Kuopio Ischaemic Heart Disease Risk Factor Study cohort in 1984-1989 (baseline data used)

Assessments

- Dairy intake: 4-day food diaries
- Depressive symptoms: Self-report, measured via the Human Population Laboratory (HPL) Depression scale

Analyses

- We performed descriptive statistics and multivariable logistic regression
- To better understand the risk factor impact, we also performed an exploratory analyses using data-driven cut-offs

Results

1. For every 100g increase in fermented dairy intake, there was a 10% relative decrease in the prevalence of elevated depressive symptoms (adjusted model, see table 2).
2. For every 100g increase in non-fermented dairy intake, there was a 5% relative increase in the prevalence of elevated depression symptoms (adjusted model, see table 2).
3. No association was observed between total dairy consumption and depressive symptoms.

Table 1: Descriptive statistics according to depressed v non-depressed

	No depressive symptoms	Depressive symptoms	P for difference*
N	2320	283	-
Age (years)	52.97 ± 5.17	53.47 ± 4.64	0.122
Total dairy (g/day)	708.77 ± 358.76	711.99 ± 382.97	0.888
Fermented dairy (g/day)	169.56 ± 222.40	130.48 ± 164.49	**0.004**
Non-fermented dairy (g/day)	517.60 ± 327.84	564.09 ± 371.66	**0.027**

*Independent sample t-test

Table 2: Continuous association between dairy (per 100g) and depressive symptoms

	Model 1*			Model 2**		
	β	95% CI	p value	β	95% CI	p value
Fermented dairy (per 100g)	0.91	0.85-0.97	**0.004**	0.90	0.84-0.96	**0.001**
Non-fermented dairy (per 100g)	1.04	1.01-1.08	**0.027**	1.05	1.007-1.096	**0.022**
Total dairy (per 100g)	1.00	0.97-1.04	0.89	0.99	0.95-1.04	0.783

*Unadjusted **Adjusted for age(years), socioeconomic status, energy intake(kJ) and examination month

Table 3: Exploratory analyses between fermented dairy and depressive symptoms

	Tertile 1 (0-500g per day)		Tertile 2 (500-600g per day)		Tertile 3 (600g+ per day)		P for trend
	β	95% CI	β	95% CI	β	95% CI	
Model 1*	Reference		0.56	0.24-1.23	0.23	0.09-0.64	**0.002**
Model 2**	Reference		0.53	0.23-1.22	0.20	0.07-0.56	**0.001**

*Unadjusted
**Adjusted for age (years), SES, energy intake (kJ) and examination month

Conclusion

- Fermentation could be one key element affecting the associations between different dairy products and depressive symptoms.
- This association may be explained by probiotics and bacterial metabolites within fermented dairy products.
- We have proposed cut-offs based on tertiles for fermented and non-fermented dairy intake from this exploratory analysis.
- Longitudinal studies are required to confirm these findings.

References

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