Dairy Consumption is Inversely Associated with the Prevalence of the Metabolic Syndrome in Tehranian Adults

OBJECTIVE
To evaluate the relation between dairy consumption and metabolic syndrome in Tehranian adults.

STUDY DETAILS
– This is a cross-sectional study conducted within the framework of the Tehran Lipid and Glucose Study (TLGS), which is a prospective study
– 827 subjects (357 men and 470 women) aged 18 to 74 years participated
– Exclusions included those with a history of cardiovascular disease (CVD), diabetes or stroke (due to potential diet changes) or those with energy intakes <800 or >4200 kcal/day
– Usual dietary intake was assessed with the use of a 168-item semiquantitative food-frequency questionnaire (FFQ)
– Subjects were divided into dairy quartiles
– Dairy consumption included milk, yogourt and cheese

<table>
<thead>
<tr>
<th>Quartile</th>
<th>Servings of dairy per day</th>
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<tbody>
<tr>
<td>1st</td>
<td>&lt;1.7</td>
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<tr>
<td>2nd</td>
<td>1.7 to &lt;2.3</td>
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<tr>
<td>3rd</td>
<td>2.3 to &lt;3.1</td>
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<tr>
<td>4th</td>
<td>≥3.1</td>
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</tbody>
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Metabolic syndrome was defined as the presence of ≥3 of the following 5 components: enlarged waist circumference (≥102 cm in men and ≥88 cm in women), low serum HDL cholesterol (<40 mg/dl in men and <50 mg/dl in women), high serum triacylglycerol concentrations (≥150 mg/dl), elevated blood pressure (≥130/85 mmHg) and abnormal glucose homeostasis (fasting plasma glucose concentration ≥110 mg/dl)

KEY FINDING
Dairy consumption (specifically milk, yogourt and cheese) is inversely associated with the risk of having metabolic syndrome.

Higher dairy consumption is significantly associated with a lower risk of developing abdominal adiposity and hypertension.

The protective effect of dairy intake is mediated to some extent by calcium and possibly protein.

RESULTS
– Those in the 3rd and 4th quartiles had a lower body mass index (BMI) than those in the two lower quartiles (25.6 and 24.9 kg/m² vs. 26.7 and 26.8, 1st and 2nd respectively)
– There was no significant differences in serum triacylglycerol and abnormal glucose homeostasis
– The metabolic syndrome and the components—enlarged waist circumference, hypertension and low HDL-cholesterol—decreased with increasing dairy consumption in men and women
– Those who consumed higher amounts of dairy foods had significantly smaller waist girth, higher HDL-cholesterol and lowered systolic and diastolic blood pressure than those who consumed less, after adjustment for confounding factors—age, sex, smoking, physical activity, BMI, waist-to-hip ratio, total energy intake, percentage of energy from fat, consumption of fruits, vegetables and meat and use of hypertensive drugs and estrogen
– In order to identify possible mechanisms, further separate adjustments for calcium and protein intakes revealed that the relation of dairy consumption and the metabolic syndrome was mediated to some extent by calcium and possibly protein
Weighing The Evidence: What Is The Role of Milk Products in Healthy Weights?


Distribution of subjects with metabolic syndrome and its components across dairy quartiles

![Bar chart showing the distribution of subjects with metabolic syndrome and its components across dairy quartiles.]

*p < 0.01  †p < 0.02  ‡p < 0.03

Azadbakht et al. 2005

Multivariate-adjusted risk for metabolic syndrome and its components

![Bar chart showing the multivariate-adjusted risk for metabolic syndrome and its components.]

* Adjusted for age, total energy intake, percentage of energy from fat, BMI, use of blood pressure and estrogen medication, smoking, physical activity and food group intake
†p < 0.02  ‡p < 0.001

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