

Citation:

Hu FB, van Dam RM, Liu S. Diet and risk of Type II diabetes: The role of types of fat and carbohydrate. *Diabetologia*. 2001 Jul; 44(7): 805-817.

PubMed ID: [11508264](#)

Study Design:

Meta-analysis or Systematic Review

Class:

M - [Click here](#) for explanation of classification scheme.

Research Design and Implementation Rating:

POSITIVE: See Research Design and Implementation Criteria Checklist below.

Research Purpose:

To review current evidence on the association between types of fat and carbohydrates and insulin resistance and type 2 diabetes (T2D).

Inclusion Criteria:

- Epidemiologic studies that examine the associations between dietary fat and carbohydrate and risk of developing hyperglycemia and T2D
- Included both prospective cohort studies and cross-sectional studies
- Examined specific fatty acids
- Subjects without T2D or impaired glucose tolerance (IGT).

Exclusion Criteria:

- Human diet intervention trials
- Did not examine specific fatty acids
- Subjects with T2D or IGT
- Animal studies.

Description of Study Protocol:**Recruitment**

14 epidemiologic studies and five cross-sectional studies of dietary fat and carbohydrate and association with hyperglycemia and T2D.

Design

Systematic review.

Dietary Intake/Dietary Assessment Methodology

Food-frequency questionnaires (FFQs) and diet history.

Data Collection Summary:

Date Range

1974 to 2001.

Dependent Variables

Type 2 diabetes.

Independent Variables

Types of dietary fatty acids and carbohydrates.

Description of Actual Data Sample:

- *Initial N:* 20 to 4,903
- *Age:* Adults (age range 25 to 89 years)
- *Ethnicity:* International
- *Other relevant demographics:* Observational studies conducted on men and women in specific sub-populations in the US, Europe and Israel
- *Location:* US, Europe, Israel.

Summary of Results:

Key Findings

- Higher intakes of polyunsaturated fatty acids (PUFA) could improve glucose metabolism and insulin resistance
- Long-chain PUFA may also improve glucose metabolism and insulin resistance
- Higher intakes of saturated fatty acids (SFA) adversely affect glucose metabolism and insulin resistance
- High intakes of vegetable fat and PUFA were associated with a decreased risk of T2D.

Author Conclusion:

Replacing SFA with PUFA could appreciably reduce risk of type 2 diabetes.

Reviewer Comments:

None.

Research Design and Implementation Criteria Checklist: Review Articles

Relevance Questions

- | | | |
|----|---|-----|
| 1. | Will the answer if true, have a direct bearing on the health of patients? | Yes |
| 2. | Is the outcome or topic something that patients/clients/population groups would care about? | Yes |
| 3. | Is the problem addressed in the review one that is relevant to nutrition or dietetics practice? | Yes |
| 4. | Will the information, if true, require a change in practice? | Yes |

Validity Questions

- | | | |
|-----|--|-----|
| 1. | Was the question for the review clearly focused and appropriate? | Yes |
| 2. | Was the search strategy used to locate relevant studies comprehensive? Were the databases searched and the search terms used described? | Yes |
| 3. | Were explicit methods used to select studies to include in the review? Were inclusion/exclusion criteria specified and appropriate? Were selection methods unbiased? | Yes |
| 4. | Was there an appraisal of the quality and validity of studies included in the review? Were appraisal methods specified, appropriate, and reproducible? | ??? |
| 5. | Were specific treatments/interventions/exposures described? Were treatments similar enough to be combined? | Yes |
| 6. | Was the outcome of interest clearly indicated? Were other potential harms and benefits considered? | Yes |
| 7. | Were processes for data abstraction, synthesis, and analysis described? Were they applied consistently across studies and groups? Was there appropriate use of qualitative and/or quantitative synthesis? Was variation in findings among studies analyzed? Were heterogeneity issues considered? If data from studies were aggregated for meta-analysis, was the procedure described? | Yes |
| 8. | Are the results clearly presented in narrative and/or quantitative terms? If summary statistics are used, are levels of significance and/or confidence intervals included? | Yes |
| 9. | Are conclusions supported by results with biases and limitations taken into consideration? Are limitations of the review identified and discussed? | Yes |
| 10. | Was bias due to the review's funding or sponsorship unlikely? | Yes |