MEDITERRANEAN DIET AND FERTILITY

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1. Infertility: causes and risk factors
2. Diet and fertility
3. The DNI study
4. Conclusions
1. Infertility: causes and risk factors

• 10% infertile couples worldwide

• Male and female causes:
  o Ovulatory disorders
  o Endometriosis
  o Tubal disease
  o Sperm factors
  o Psychological problems
  o Lifestyle factors: diet, smoking, physical activity, obesity, etc.
  o Others
  o Unknown
The British Photographer Carl Warner created a series of landscape images utilizing basic food ingredients found in a typical Kitchen.

The images "foodscapes" (made up of the words Food and Landscapes) show scenes including, Caverns, Submarines, Forests, Beaches etc. using fruits, Legumes, Cheeses, Pastas, Breads among others.

Carl’s Website is at:  
http://www.carlwarner.com/
1. Infertility: causes and risk factors
2. Diet and fertility
3. The DNI study
4. Conclusions
A prospective study of dairy foods intake and anovulatory infertility

J.E.Chavarro\textsuperscript{1,6}, J.W.Rich-Edwards\textsuperscript{2,4,5}, B.Rosner\textsuperscript{3,4,5} and W.C.Willett\textsuperscript{1,2,5}

\textsuperscript{1}Department of Nutrition, \textsuperscript{2}Department of Epidemiology and \textsuperscript{3}Department of Biostatistics, Harvard School of Public Health, Boston, MA, USA, \textsuperscript{4}Connors Center for Women’s Health and Gender Biology, and \textsuperscript{5}Channing Laboratory, Department of Medicine, Brigham and Women’s Hospital, Boston, MA, USA.

Background: A number of observational studies have suggested an association between dairy fat intake and delayed achievement of pregnancy or becoming pregnant on the first cycle attempt. However, findings have been inconsistent, and most studies have included relatively few women consuming multiple servings per week of low-fat dairy foods, or have not adjusted for confounding factors. A previous study conducted in our cohort suggested that intakes of lactose, calcium, phosphorus and vitamin D were unrelated to anovulatory infertility. CONCLUSIONS: Intake of low-fat dairy foods may increase the risk of anovulatory infertility whereas intake of high-fat dairy foods may decrease this risk. Further, lactose (the main carbohydrate in milk and dairy products) may not affect fertility within the usual range of intake levels in the general population.
At first sight, it’s hard to notice that the mountains are made up of bread...
A prospective study of dietary carbohydrate quantity and quality in relation to risk of ovulatory infertility

JE Chavarro\textsuperscript{1,2}, JW Rich-Edwards\textsuperscript{2,3,4}, BA Rosner\textsuperscript{2,5} and WC Willett\textsuperscript{1,2,4}

Objective: To examine the relationship between dietary carbohydrate quantity and quality and risk of ovulatory infertility.

Subjects and Methods: A prospective cohort study of women who attempted to become pregnant and who attended a fertility center. Dietary carbohydrate intake was assessed using a validated food frequency questionnaire.

Results: During follow-up, 676 women in whom ovulatory infertility was confirmed were identified. Total carbohydrate intake was positively related to ovulatory infertility risk among non-parous women. The glycemic load was also positively related to ovulatory infertility. These relationships were stronger among women who were using endogenous estrogen than among those using exogenous estrogen.

Conclusions: The amount and quality of carbohydrate in diet may be important determinants of ovulation and fertility in healthy women.
In this mountain scene, bread sticks and cured ham slices are transformed into a carriage to be pushed down a path made of salami bordered by trees made bacon.
Protein intake and ovulatory infertility

Jorge E. Chavarro, MD, ScD; Janet W. Rich-Edwards, MPH, ScD; Bernard A. Rosner, PhD; Walter C. Willett, MD, DrPH

CONCLUSION: Replacing animal sources of protein with vegetable sources of protein may reduce ovulatory infertility risk.

Key words: diet, epidemiology, infertility, ovulation, protein

This reddish sea on this beach scene at sunset is made up of salmon filets. The rocks are of potatoes and bread. And the small boat made of a green pea pod complete the scene.
Trans-unsaturated fats instead of:

- carbohydrates    RR=1.73 (1.09-2.73)
- monounsaturated fats    RR=2.31 (1.09-4.87)
- n-6 polyinsaturated fats    RR=1.79 (1.12-2.89)
Use of multivitamins, intake of B vitamins, and risk of ovulatory infertility

Jorge E. Chavarro, M.D., Sc.D., a Janet W. Rich-Edwards, Sc.D., M.P.H., b,c,d Bernard A. Rosner, Ph.D., d,e and Walter C. Willett, M.D., Dr.P.H. a,c,d

a Department of Nutrition, c Department of Epidemiology, and e Department of Biostatistics, Harvard School of Public Health, Boston; b Connors Center for Women’s Health and Gender Biology, and d Channing Laboratory, Department of Medicine, Brigham and Women’s Hospital and Harvard Medical School, Boston, Massachusetts

Objective: To examine whether use of multivitamin supplements is associated with ovulatory infertility.

Design: A prospective cohort study.

Setting: The Nurses’ Health Study II.

Patient(s): Eighteen thousand women who attempted pregnancy.

Intervention(s): None, observational study.

Main Outcome Measure(s): Incidence of infertility.

Result(s): During 8 years of follow-up, there was an inverse association between frequency of use of multivitamin supplements and relative risk (95% confidence interval) of infertility for each additional dose per week or less, 0.69 (0.51, 0.94) for two to six tablets per week, and 0.58 (0.41, 0.83) for nine or more tablets per week. Adjusted relative risks (95% confidence interval) were 0.78 (0.63, 0.96) for one tablet per week or less and 0.80 (0.65, 0.98) for six or more tablets per week, when compared with women who did not use these supplements (P, trend <.001). Folic acid appeared to explain part of the association between multivitamin supplement use and risk of ovulatory infertility.

Conclusion(s): Regular use of multivitamin supplements may decrease the risk of ovulatory infertility. (Fertil Steril® 2008;89:668–76. ©2008 by American Society for Reproductive Medicine.)
This Italian kitchen has many vegetables and pastas. The houses seen through the window are made of cheese.
Infertility and diet:

**Increase insulin resistance**

hyperglycemia/hyperinsulinemia

ovarian thecal hyperplasia and hyperandrogenism

**Ovulatory dysfunction**
Diet and Lifestyle in the Prevention of Ovulatory Disorder Infertility

Jorge E. Chavarro, MD, ScD, Janet W. Rich-Edwards, MPH, ScD, Bernard A. Rosner, PhD, and Walter C. Willett, MD, DrPH

OBJECTIVE: To evaluate the relation of a dietary pattern and other lifestyle practices to risk of ovulatory disorder infertility.

METHODS: We followed a cohort of 17,544 women without a history of infertility for 8 years as they tried to become pregnant or became pregnant. A dietary pattern based on factors previously related to lower ovulatory disorder infertility (higher consumption of monounsaturated fats, vegetable protein sources, low glycemic carbohydrates, high-fat dairy, multivitamins, and iron from plants and supplements) and other lifestyle information was prospectively related to the incidence of infertility.

RESULTS: Increasing adherence to a “fertility diet” pattern was associated with a lower risk of ovulatory disorder infertility. The multivariable-adjusted relative risk of ovulatory disorder infertility comparing women in the highest with women in the lowest quintile of the “fertility diet” pattern score was 0.34 (95% confidence interval 0.23–0.48; P for trend <.001). This inverse relation was similar in subgroups defined by women’s age, parity, and body weight. A combination of five or more low-risk factors for ovulatory disorder infertility was associated with a relative risk of 0.24 (95% confidence interval 0.15–0.38; P for trend <.001).

“FERTILITY DIET”
- Monounsaturated fats
- Vegetable protein sources
- Low glycemic carbohydrates
- High fat dairy
- Multivitamins
- Iron from plants and supplements
The creativity is impressive: balloons made of fruit and legumes, trees of broccoli, rocks of potatoes, fields of corn and peppers, and a town made of cheese with a carrot tower... Wow!
Accruing evidence on benefits of adherence to the Mediterranean diet on health: an updated systematic review and meta-analysis\textsuperscript{1,2}

Francesco Sofi, Rosanna Abbate, Gian Franco Gensini, and Alessandro Casini

ABSTRACT

Background: The Mediterranean diet has long been reported to be protective against the occurrence of several different health outcomes.

Objective: We aimed to update our previous cohort prospective studies that included adherence to the Mediterranean diet on health outcomes.

Design: We conducted a comprehensive electronic databases up to June 2010.

Results: The updated review process showed that in the past 2 years, there were not meta-analyses (1 study for overall mortality, 1 study for cardiovascular disease incidence or mortality, 1 study for cardiovascular disease mortality, and 2 studies for neurodegenerative diseases) included 2 health outcomes not covered by previous studies with a random-effects model that included these recent studies showed that adherence to the Mediterranean diet was associated with a significant reduction of overall mortality (relative risk: 0.90, 95% CI: 0.87, 0.93), cancer incidence (relative risk: 0.92, 95% CI: 0.81, 0.94), and neurodegenerative diseases (relative risk: 0.94, 95% CI: 0.89, 0.99). The meta-regression analysis showed that sample size was the most significant contributor to the model, significantly influencing the estimate of the association for overall mortality.

Conclusion: This updated meta-analysis confirms, in a larger number of subjects and studies, the protective effect of adherence to the Mediterranean diet in relation to the occurrence of major chronic degenerative diseases. Am J Clin Nutr 2010;92:1189-96.

METHODS

Literature search

According to the statement of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (10), we systematically searched published cohort prospective studies that investigated the association between adherence to the Mediterranean diet and health outcomes.
Accruing evidence on benefits of adherence to the Mediterranean diet on health: an updated systematic review and meta-analysis

Francesco Sofi, Rosanna Abbate, Gian Franco Gensini, and Alessandro Casini

ABSTRACT

Background: The Mediterranean diet has long been reported to be protective against the occurrence of several different health outcomes.

Objective: We aimed to update our previous meta-analysis of published cohort prospective studies that investigated the effects of adherence to the Mediterranean diet on health status.

Design: We conducted a comprehensive literature search through electronic databases up to June 2010.

Results: Significant reductions were observed for overall mortality, cardiovascular disease mortality, incidence of cancer, and incidence of degenerative diseases.

Conclusion: This updated meta-analysis confirms, in a larger number of subjects and studies, the significant and consistent protection provided by adherence to the Mediterranean diet in relation to the occurrence of major chronic degenerative diseases.

METHODS

Literature search

According to the statement of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (10), we systematically searched published cohort prospective studies that investigated the association between adherence to the Mediterranean diet and...
The preconception Mediterranean dietary pattern in couples undergoing in vitro fertilization/intracytoplasmic sperm injection treatment increases the chance of pregnancy

Marijana Vujkovic, B.Sc., a Jeanne H. de Vries, Ph.D., b Jan Lindemans, Ph.D., c Nick S. Macklon, Ph.D., a,h,i Peter J. van der Spek, Ph.D., c Eric A. P. Steegers, Ph.D., a and Régine P. M. Steegers-Theunissen, Ph.D. a,d,e,f

Fertility and Sterility® Vol. 94, No. 6, November 2010

Objective: To investigate associations between preconception dietary patterns and IVF/ICSI outcomes validated by biomarkers of the homocysteine pathway.

Design: Observational prospective study.

Setting: A tertiary referral center.

Patient(s): One hundred and sixty-three couples undergoing IVF/ICSI treatment.

Intervention(s): No interventions.

Main Outcome Measurements: Adherence to the Mediterranean diet, intakes of snacks, meats, and mayonnaise, and vitamin B6, homocysteine.

Result(s): In women, higher adherence to the Mediterranean diet (variation explained 11.9%) was associated with a 40% increased probability of achieving pregnancy after IVF/ICSI treatment.

This study demonstrates that Dutch subfertile couples with high adherence to the “Mediterranean” dietary pattern have a 40% increased probability of achieving pregnancy after IVF/ICSI treatment.

intakes of snacks, meats, and mayonnaise, and positively correlated with red blood cell folate (β = 0.07). The “Mediterranean” dietary pattern (variation explained 9.1%), that is, high intakes of vegetable oils, vegetables, fish, and legumes and low intakes of snacks, was positively correlated with red blood cell folate (β = 0.13), and vitamin B6 in blood (β = 0.09) and follicular fluid (β = 0.18). High adherence by the couple to the “Mediterranean” diet increased the probability of pregnancy, odds ratio 1.4 (95% confidence interval 1.0–1.9).

Conclusion(s): A preconception “Mediterranean” diet by couples undergoing IVF/ICSI treatment contributes to the success of achieving pregnancy. (Fertil Steril® 2010;94:2096–101. ©2010 by American Society for Reproductive Medicine.)

Key Words: Nutrition, Mediterranean diet, folate, vitamin B6, homocysteine, subfertility, reproduction
1. Infertility: causes and risk factors
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3. The DNI study
4. Conclusions
3. The DNI study

DNI: “Nutritional Determinants of Infertility”

• To investigate associations between dietary patterns and difficulty conceiving.

• Nested case-control study in the SUN project:
  - Ongoing, dynamic, multipurpose, prospective cohort study (from 1999)
  - To assess the benefits of the Mediterranean Food Pattern
  - University graduates in Spain (N=20,700)
  - Biennial questionnaires

This study was supported by the Spanish Government (grant PI050514 and RTIC 06/0045 from the Instituto de Salud Carlos III, Fondo de Investigaciones Sanitarias).
3. The DNI study

Cohort profile: The ‘Seguimiento Universidad de Navarra’ (SUN) study

María Seguí-Gómez,* Carmen de la Fuente, Zenaida Vázquez, Jokin de Irala and Miguel A Martínez-González

How did the study come about?

The SUN study began at the Universidad de Navarra’s Department of Preventive Medicine and Public Health and has since integrated other universities (Santiago de Compostela, Cantabria, Las Palmas, Jaén and Saragossa). The motivation behind its development, dating back to the late 1990s, was the lack of scientific evidence detailing the benefits of the Mediterranean Food Pattern. Starting a Spanish cohort was a unique opportunity to sample participants who are more likely to follow variations of this food pattern.1,2

To explore this idea further, Professor Miguel Ángel Martínez travelled to the Harvard School of Public Health to learn about similar large cohort studies currently being conducted in the US, such as the Nurses’ Health Study and the Health Professionals’ Follow-up study.3 An outline of the SUN study was designed during his sabbatical at Harvard.

are recruited through collaborations with alumni and professional associations throughout the country (e.g. Universidad de Navarra Alumni Association, regional associations of Physicians, Nurses, Pharmacists, Dentists, and Engineers). A few hundred students were recruited during their last years at university, with follow-up questionnaires confirming their graduate status. Approximately 20% of invitees agreed to participate in the study. Table 1 illustrates the range of professional degrees among cohort participants.

As of May 2006, the sample consisted of 16 390 participants: 9721 females (59.3%) and 6669 males (40.7%). The age range is 18–101 with mean ages of 42.7 (SD: 13.3) for men and 35.1 (SD: 10.7) for women. Table 2 presents the gender and age category distribution of participants in more detail.

Because we do not have any health or lifestyle information on those refusing to participate in the study, we cannot evaluate differences between participants and non-participants. With regard to the similarities between participants and the
This one is made from lettuce leaves, rocks of sweet and red potatoes, canyon walls made of bread, and the sky of red cabbage...
3. The DNI study

• **Cases:** n=485
  - Female participants (20-45 years)
  - “Have you consulted a physician due to difficulty getting pregnant?”

• **Controls:** n=1670
  - Female participants (20-45 years)
  - Not having consulted a doctor for difficulty to get pregnant
  - ≥ 1 child

• Matched on age and follow-up time
3. The DNI study

Baseline questionnaire: 554 items

• 136-item validated food-frequency questionnaire
  (Int J Epidemiol 1993;22:512-9; Br J Nutr 2010;103:1808-16.)

• Non-dietary variables:
  o Weight and height (Rev Esp Obes 2005;3:183-9)
  o Physical activity (Public Health Nutr 2005;9:920-7)
  o Smoking habit

Follow-up questionnaires:

• “Have you consulted a physician due to difficulty to get pregnant?”
3. The DNI study

Statistical analysis (1):

- Principal component analysis: Food Patterns
  - 30 pre-defined food categories
  - Quantitative score
  - Quartiles
3. The DNI study

Statistical analysis (2):

• Conditional logistic regression models
  - Outcome: consulting for difficulty getting pregnant
  - Potential confounders:
    - BMI, smoking, alcohol,
    - total energy intake,
    - vitamin supplements, intake of plant protein*, animal protein*, trans-fat*, fiber*

* Adjusted for total energy intake using the residuals method.
3. The DNI study

- **10,977** women recruited up to July 31st 2007
- **8,619** aged 20-45 years
- **7,763** follow-up info.

- **7.9%** have consulted a doctor due to difficulties getting pregnant

Matching
- Extreme kcal/day intake
- Missing values

- **485** CASES
- **1670** CONTROLS
## Baseline characteristics:

<table>
<thead>
<tr>
<th></th>
<th>Controls (n=1670)</th>
<th>Cases (n=485)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, years</td>
<td>33.1 (5.3)</td>
<td>31.3 (4.4)</td>
</tr>
<tr>
<td>Body mass index, kg/m²</td>
<td>22.1 (2.9)</td>
<td>21.6 (2.7)</td>
</tr>
<tr>
<td>Children, n</td>
<td>1.2 (1.0)</td>
<td>0.2 (0.5)</td>
</tr>
<tr>
<td>Smoking (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Past smokers</td>
<td>26.5</td>
<td>24.3</td>
</tr>
<tr>
<td>Current smokers</td>
<td>23.2</td>
<td>24.3</td>
</tr>
<tr>
<td>Physical activity, METs-h/week</td>
<td>19.7 (17.1)</td>
<td>21.1 (18.9)</td>
</tr>
<tr>
<td>Alcohol intake, g/day</td>
<td>3.1 (4.6)</td>
<td>4.2 (6.0)</td>
</tr>
<tr>
<td>Coffee consumption, servings/day</td>
<td>1.2 (1.2)</td>
<td>1.2 (1.2)</td>
</tr>
</tbody>
</table>
# 3. The DNI study

## Baseline characteristics:

<table>
<thead>
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<th>Controls (n=1670)</th>
<th>Cases (n=485)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total energy intake, kcal/day</strong></td>
<td>2356 (552)</td>
<td>2279 (567)</td>
</tr>
<tr>
<td><strong>Total fat intake, % energy intake</strong></td>
<td>37.9 (6.2)</td>
<td>37.5 (6.6)</td>
</tr>
<tr>
<td><strong>SFA, % energy intake</strong></td>
<td>12.9 (3.0)</td>
<td>12.8 (3.0)</td>
</tr>
<tr>
<td><strong>MUFA, % energy intake</strong></td>
<td>16.3 (3.6)</td>
<td>16.1 (3.7)</td>
</tr>
<tr>
<td><strong>PUFA, % energy intake</strong></td>
<td>5.2 (1.6)</td>
<td>5.2 (1.7)</td>
</tr>
<tr>
<td><strong>tFA, % energy intake</strong></td>
<td>0.4 (0.2)</td>
<td>0.4 (0.2)</td>
</tr>
<tr>
<td><strong>Iron intake, mg/day</strong></td>
<td>17.0 (5)</td>
<td>16.0 (5)</td>
</tr>
<tr>
<td><strong>Plant protein, g/day</strong></td>
<td>29.0 (7)</td>
<td>29.0 (7)</td>
</tr>
<tr>
<td><strong>Animal protein, g/day</strong></td>
<td>76.0 (18)</td>
<td>74.0 (19)</td>
</tr>
<tr>
<td><strong>Dietary fiber, g/day</strong></td>
<td>26.0 (10)</td>
<td>27.0 (10)</td>
</tr>
<tr>
<td><strong>Vitamin supplements consumption (%)</strong></td>
<td>24.3</td>
<td>20.4</td>
</tr>
</tbody>
</table>
## 3. The DNI study

### Food Patterns in the SUN Project

<table>
<thead>
<tr>
<th>Food Group</th>
<th>Mean daily intake (g/d), (SD)</th>
<th>Factor 1 ‘Western’</th>
<th>Factor 2 ‘Mediterranean’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fast food</td>
<td>45 (34)</td>
<td>0,68</td>
<td></td>
</tr>
<tr>
<td>Potatoes</td>
<td>51 (43)</td>
<td>0,60</td>
<td></td>
</tr>
<tr>
<td>Unprocessed red meat</td>
<td>75 (43)</td>
<td>0,48</td>
<td></td>
</tr>
<tr>
<td>Processed meat</td>
<td>45 (29)</td>
<td>0,46</td>
<td></td>
</tr>
<tr>
<td>Whole-fat dairy products</td>
<td>207 (199)</td>
<td>0,33</td>
<td></td>
</tr>
<tr>
<td>Eggs</td>
<td>23 (16)</td>
<td>0,32</td>
<td></td>
</tr>
<tr>
<td>Refined grains</td>
<td>78 (54)</td>
<td>0,32</td>
<td></td>
</tr>
<tr>
<td>Sauces</td>
<td>3 (4)</td>
<td>0,30</td>
<td></td>
</tr>
<tr>
<td>Vegetables</td>
<td>547 (316)</td>
<td>-</td>
<td>0,66</td>
</tr>
<tr>
<td>Fruits</td>
<td>350 (290)</td>
<td>-</td>
<td>0,52</td>
</tr>
<tr>
<td>Fish</td>
<td>96 (60)</td>
<td>-</td>
<td>0,51</td>
</tr>
<tr>
<td>Poultry</td>
<td>48 (32)</td>
<td>-</td>
<td>0,42</td>
</tr>
<tr>
<td>Low-fat dairy products</td>
<td>255 (247)</td>
<td>-</td>
<td>0,42</td>
</tr>
<tr>
<td>Olive oil</td>
<td>17 (14)</td>
<td>-</td>
<td>0,34</td>
</tr>
<tr>
<td>Whole grains</td>
<td>14 (30)</td>
<td>-</td>
<td>0,31</td>
</tr>
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* Varimax rotated factors are displayed. Factor loadings <0.3 were omitted for simplicity
3. The DNI study

Western dietary pattern

OR (95% CI) for difficulty conceiving

Adjusted for BMI, smoking, alcohol consumption, total energy intake, vitamin supplements and intake of plant proteins, animal proteins, trans-fat and fiber
3. The DNI study

**Mediterranean dietary pattern:**

OR (95% CI) for difficulty conceiving

Adjusted for BMI, smoking, alcohol consumption, total energy intake, vitamin supplements and intake of plant proteins, animal proteins, trans-fat and fiber
Edible ingredients in this Italian-inspired rural scene include a lasagna cart, fields of pasta, a pine nut wall, mozzarella clouds, trees of peppers and chilies and a parmesan village.
A greater adherence to the Mediterranean-type dietary pattern may enhance fertility.

Further evidence is needed.
Inconsistent findings about alcohol and risk of infertility:

- Amount consumed (low, moderate, high)
- Type of drink (wine, beer, spirits)

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### Alcohol and difficulty conceiving: preliminary results

<table>
<thead>
<tr>
<th># Alcoholic drinks</th>
<th>OR per one drink increase per week</th>
<th>P for trend</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cases</td>
<td>168</td>
<td>150</td>
</tr>
<tr>
<td>Controls</td>
<td>175</td>
<td>156</td>
</tr>
<tr>
<td>Crude</td>
<td>1 (ref)</td>
<td>1.00 (0.73-1.36)</td>
</tr>
<tr>
<td>Model 1</td>
<td>1 (ref)</td>
<td>1.04 (0.76-1.43)</td>
</tr>
<tr>
<td>Model 2</td>
<td>1 (ref)</td>
<td>1.05 (0.77-1.45)</td>
</tr>
<tr>
<td>Model 3</td>
<td>1 (ref)</td>
<td>1.05 (0.77-1.44)</td>
</tr>
</tbody>
</table>

Model 1: Adjusted for BMI, smoking, total energy intake, vitamin supplements
Model 2: additionally adjusted for intake of plant and animal proteins, trans-fat, fiber
Model 3: additionally adjusted for Mediterranean diet adherence.
Alcohol consumption
OR* (CI 95%) for difficulty conceiving

OR* per one drink/week increase = 1.05 (95% CI 1.01-1.10)

* Adjusted for BMI, smoking, total energy intake, vitamin supplements and intake of plant and animal proteins, trans-fat, fiber and Mediterranean diet adherence.
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4. Conclusions

- **May enhance fertility:**
  - Monounsaturated instead of trans fats
  - Vegetable rather than animal protein sources
  - Low glycemic carbohydrates
  - High fat dairy
  - Multivitamins
  - Iron from plants and supplements
  - Greater adherence to the Mediterranean-type dietary pattern

- **Further studies are needed to verify the benefits of the Mediterranean diet on fertility.**
Houses made of cheese, crates and baskets made of various pastas. The street is made up of legumes, and grains.