JAMA has a report today on the relationship between organic food consumption and subsequent cancers. It is the usual food survey with calculations of how well the diet conforms to government defined “healthy” nutrition and a four year follow up for the development of cancer. There is an international twist in that the data is being reported from France, where organic labeling requires no use of synthetic pesticides or processes – far stricter than the US because the French are very serious about their food’s provenance.

The limitations of such studies are well-known, surveys, recall issues, reporting your diet in a more flattering light. We also know that those individuals deliberately seeking organic foods are more often involved with other healthful behavior like exercise and not smoking – both true in this study. They are also more frequently affluent and with higher education levels and jobs less exposed to the environment – again all true for this study.

Let’s compare what they write:

From the summary: “A higher frequency of organic food consumption was associated with a reduced risk of cancer.”

From the discussion: “In this large cohort of French adults, we observed that a higher organic food score, reflecting a higher frequency of organic food consumption, was associated with a decreased risk of developing NHL (non-Hodgkins lymphoma) and postmenopausal breast cancer, while no association was detected for other types of cancer.” [1]

So the first statement is true, but perhaps not as true as the second statement where the effect only involved two of the cancers they considered. If you look at the data itself, we might also ponder whether the decreased risk in developing NHL is clinically relevant. First, the p-value for
the trend of more organics, less cancer is .049 – a value just meeting an arbitrary standard, but more importantly, the overall incidence of lymphomas where small making tiny changes, that might reflect randomness more statistically significant. And of course, we might point out at this juncture that the diagnosis of cancer was self-reported (although 90% of those were independently confirmed from health records). So the actual number of cancers is unknown, the values presented may or may not be a good approximation but are the lowest possible numbers.

From the discussion: “In our study, we observed a lower risk of breast cancer among high organic food consumers.”

From the data:

Table 3. Multivariable Associations Between the Organic Food Score (Modeled as Quartiles) and Cancer Risk by Site, NutriNet-Santé Cohort, France, 2009 to 2016

<table>
<thead>
<tr>
<th>Variable</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
<th>P Valueb</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast cancer, No.</td>
<td>106</td>
<td>115</td>
<td>130</td>
<td>108</td>
<td>NA</td>
</tr>
<tr>
<td>HR (95% CI)</td>
<td>[Reference]</td>
<td>0.89 (0.68-1.16)</td>
<td>0.93 (0.71-1.20)</td>
<td>0.77 (0.58-1.01)</td>
<td>.10</td>
</tr>
<tr>
<td>Premenopausal breast cancer, No.</td>
<td>52</td>
<td>59</td>
<td>66</td>
<td>50</td>
<td>NA</td>
</tr>
<tr>
<td>HR (95% CI)</td>
<td>[Reference]</td>
<td>1.01 (0.69-1.47)</td>
<td>1.13 (0.78-1.64)</td>
<td>0.89 (0.59-1.35)</td>
<td>.76</td>
</tr>
<tr>
<td>Postmenopausal breast cancer, No.</td>
<td>69</td>
<td>55</td>
<td>58</td>
<td>50</td>
<td>NA</td>
</tr>
<tr>
<td>HR (95% CI)</td>
<td>[Reference]</td>
<td>0.76 (0.53-1.08)</td>
<td>0.75 (0.53-1.07)</td>
<td>0.66 (0.45-0.96)</td>
<td>.03</td>
</tr>
</tbody>
</table>

Once again, a partial truth, is the absolute value less, yes. Is the reduction statistically significant, only for the post-menopausal women; is the reduction clinically significant, no one knows.

From the discussion: “When considering different subgroups, the results herein were no longer statistically significant in younger adults, men, participants with only a high school diploma and with no family history of cancer, never smokers and current smokers, and participants with a high overall dietary quality, while the strongest association was observed among obese individuals (although the 95% CI was large).”

That would mean, if I understand them correctly, that the reduction in cancer risk from eating organic is only in women, with a family history of cancer, who are former smokers and who did not necessarily eat high-quality foods. Let us leave the obese beneficiaries to the side momentarily. How could eating a less than healthy diet reduce a health risk? The researchers respond, “One hypothesis may be that higher intake of pesticide-contaminated products may partly counterbalance the beneficial role of high-quality foods…” Those must be amazing foods.

As to the role of obesity, here are our researchers, “…previous occupational data have indicated a potential interaction between obesity and pesticide use on cancer risk. It can be hypothesized that obese individuals with metabolic disorders may be more sensitive to potential chemical disruptors, such as pesticides.” Fair enough, but this is a study of individuals who are not exposed to pesticides at work, so it is apples to oranges. And if you look at the cited study, the Hazard ratio was 1.05 for men for colon cancer and 1.05 for post-menopausal women and breast cancer. Here is a statement from the cited paper, “The positive associations between BMI and postmenopausal breast cancer were present among women who did not use malathion, diazinon, or any organophosphate or organochlorine insecticide, but not in women who used these pesticides.

So where does that leave us? Another observational study, severely limited because both the
variable of interest, diet and the outcome of interest, cancer is self-reported; that proudly proclaims a more general truth, then is substantiated in their paper’s evidence. I am no further along in knowing whether eating organic foods lessen my risks than before; I did lose two-hours of my life reading and investigating the paper – perhaps an organic avocado will get those hours back. In the meantime, another paper from a “high impact” journal that contributes more shade than sunlight.

[1] Those cancers that were not affected by eating more organic food included pre-menopausal breast cancer, prostate cancer, colorectal and skin cancers.


Links
[1] https://www.maxpixel.net/Food-Cuisine-Fish-Restaurant-French-Cuisine-1939956