

# Pesticides and sperm quality: A quintessential example of junk science

By ACSH Staff — March 31, 2015



A report from the Harvard School of Public Health is hitting the

headlines hard today. The conclusion: Men who eat produce with pesticide residue have poorer sperm quality than those who don't.

For example, the headline from an [article](#) [1] from Time reads: A Diet High in Pesticides Is Linked to a Lower Sperm Count.

The Daily News [article](#) [2] is titled, Diet high in pesticide-laden produce like spinach and strawberries linked to lower sperm count: study.

If you are rushed and don't have time to read the article, your next grocery stop will probably be at Whole Foods, knowing that your sperm will be safer if you shop there.

Not so fast. This is exactly the kind of study we at ACSH debunk time after time. And it is so full of faulty data and conclusions that it makes a perfect example of common study flaws, which are not only seen in this study, but in many others. And there are plenty.

Using the Time and Daily News articles as a template, ACSH's Dr. Josh Bloom singles out some of the errors in this study. Keep in mind that these same deficiencies are seen over and over in one study after another.

The troubling link between pesticide exposure and fertility isn't new; scientists have already established that [people who work with pesticides tend to have lower fertility](#) [3] than people who don't.

Comment: Right away, this is irrelevant, but biases the rest of the article. Comparisons between harm arising from occupational exposure to large amounts of a chemical even if true and trace amounts of the same chemical that the rest of us are exposed to are irrelevant. The degree of exposure amount times time of any chemical determines the risk.

The men were asked to fill out a questionnaire about their diet, asking them how often, on average, they consumed portions of fruit and vegetables..

Comment: Dietary recall data are notoriously unreliable

The team didn't tease out associations with individual pesticides. But they believe that a mixture of pesticides not just one particular pesticide is responsible for the link.

Comment. This is a classic error: Lumping together groups of chemicals that happen to have a common use, but no relationship in terms of chemical structure or mechanism of action. It not only makes it impossible to determine which, if any, chemical is responsible for the effect being studied, but violates basic principles of toxicology. Chemicals that are functionally similar (in use) but chemically diverse do not team up, or act in concert. Your body treats every chemical in the world differently. It does not know whether the chemical in question is a pesticide, preservative, or detergent, etc. Whenever you see effects that are only observed when multiple substances are present instead of the individual components, this is almost always an indicator that something is wrong.

The U.S. team analyzed 338 semen samples from 155 men attending a fertility center between 2007 and 2012.

Comment: This is screaming trouble. A study of a small population of men in a fertility clinic???

Can you think of a better place to have more variability in sperm counts? You could dismiss all the findings here based on this alone.

In addition, men with the lowest pesticide residue intake had an average of 7.5% of normally-formed sperm but this tally was nearly a third lower, at 5.1%, among those who had the highest intake. There were no significant differences between the low-and moderate-residue groups.

Comment: Three big problems here. First, the amount of pesticide was not measured. It was estimated. This alone probably invalidates the study. Second, the difference between 7.5% and 5.1% of normal sperm at a fertility clinic is likely to be a mathematical artifact, especially when taken with the fact that there was no difference seen in those men who consumed (estimated) moderate, and (estimated) low amounts. This means that there is not a *dose-dependent response* an important indicator that what you're seeing is real.

In addition, the pesticide residues were estimated rather than actually measured in the lab, and it was not known whether the fruit and vegetables that were consumed were conventionally-grown or organic.

Comment: Nothing was measured! Whatever follows is just noise. And conventional and organic farming both use pesticides just different ones. The stop at Whole Foods doesn't seem so important all of a sudden.

"In fact, we found that total intake of fruit and vegetables was completely unrelated to semen quality.

Comment: You don't have to be a bloodhound to sniff out something funny here.

This suggests that implementing strategies specifically targeted at avoiding pesticide residues, such as consuming organically-grown produce or avoiding produce known to have large amounts of residues, may be the way to go.

Comment: No it doesn't, since no distinction was made between organic and conventional products. And since there is no way to tell how much pesticide (or what kind) is on an item, good luck with the selection process.

Dr. Bloom concludes: Of these common errors, any one alone may be sufficient to render the entire study worthless. When you see many in any study, it is virtually certain that the data will be so compromised that it doesn't even matter what you are studying. The results reported will be based on information that cannot possibly lead to a sound conclusion. Unfortunately, this is the state of science today, which only serves to further confuse already bewildered consumers who are bombarded by conflicting information.

ACSH's Dr. Gil Ross added this: We see this type of agenda-driven junk science frequently on the topic of alleged adverse effects of pesticides. The Harvard School of Public Health is a notorious font of such tripe, and of course the media love sensational, fear-mongering studies to scare the public. It's a win-win-win for the scientists, the journal, and the media. The only losers: the public and science itself.

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**Links**

[1] <http://time.com/3763648/pesticides-diet-fertility/>

[2] <http://www.nydailynews.com/life-style/health/pesticide-laden-produce-linked-sperm-count-study-article-1.2168064>

[3] <http://healthland.time.com/2012/11/15/pollutants-linked-to-lower-fertility-in-both-men-and-women/>