

Deep in the Weeds of Organic Farming

by

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This case study begins with a scenario at a farmers market in which two customers begin learning about organic and conventional agriculture. Later, you will use the internet to explore these topics further before engaging in a debate with your classmates. But before you begin, take a moment to consider your opinion about organic foods. Do you think they are healthier than conventional foods? Are they worth the money?

Part I – The Farmers Market

Joann and Stan are walking around the farmers market in their neighborhood.

Joann: I'm so glad we've decided to start setting aside \$50 a week to buy local produce.

Stan: Me too. I'm sure that local foods are better for the environment. It prevents food from being shipped all around the country, right?

Joann: Right. I think that's why so many cars have that "Buy Local" bumper sticker.

Stan: I do wonder how far \$50 will go here. Think we can get as much as we can at the grocery store?

Joann: Let's explore for a while and compare prices before we buy anything.

Stan: Good plan. I see "apples" are the first thing on this list. We should check out apple prices at the two stands over there, so we can, ya know, compare apples to apples.

They split up, each checking out one stand, and then meet up again a few moments later.

Joann: Apples are \$3.50 a pound at the stand over there. They were organic.

Stan: Really? They were only \$2 a pound at the one I went to. But I didn't see an organic sign.

Joann: Hmm... it's not too busy right now. Do you think the organic farmer would tell us the benefits of organic produce, so we can weigh the benefits against the extra cost to us?

Stan: That's an excellent idea! I've always wondered if it's worth the extra money.

They walk up to the organic farm stand and talk with a farmer.

Joann: Hi there. We were wondering if you could teach us a little bit about organic farming.

Organic Farmer: I'd love to talk to you about my farm. What do you want to know?

Stan: We're mostly curious if organic food is better for us than conventional produce.

Organic Farmer: Great question. The main difference between our fruits and vegetables and conventional produce is that we don't use any synthetic pesticides or fertilizers. That makes our produce a lot cleaner.

Stan: Ah, cool, I've heard that before. But does it really make a difference to my health?

Organic Farmer: I guess it's up to you whether you want to eat a bunch of artificial chemicals. It's hard to know what happens on a conventional farm. But you can be sure organic food is safe, because a certified organic farm has to follow a lot of rules. We have to apply for approval from the government, and we have to keep records so we can prove we're doing things right. None of that is cheap.

Joann: What about the environment? Is it better for the environment that you use fewer chemicals?

Organic Farmer: Oh, for sure! Think about it. Conventional farms don't do anything to preserve soil health, so they have to use tons of fertilizers to get their plants to grow. That extra fertilizer washes away and enters streams and other water where it causes all kinds of problems. Lots of fish die. Excess pesticides used on conventional farms also kill lots of animals. Instead of artificial chemicals, we use a bunch of safe methods to help keep soils healthy and to prevent pests from overtaking our farm.

Stan: That makes a lot of sense.

Nearby customer: Organic foods also just taste a lot better. They're grown more naturally, and they aren't those nasty genetically modified organisms. I don't think many people would argue with the idea that natural things are better for you. My kid chows down on organic produce, so even children can tell the difference.

Organic Farmer: Yep! And organic produce is more nutritious too!

Joann: Thanks for your time answering our questions today.

Stan [as they walk away]: That was useful, but I feel like it's only part of the story.

Joann: I suppose to be fair we should go talk to a conventional farmer.

Stan and Joann make their way to the adjacent stand.

Stan [addressing the farmer at the stand]: 'Scuse me. Do you have a moment to talk to us about your farm?

Conventional Farmer: Of course. Would be glad to. I operate a small, family-owned farm only about 15 miles outside of town. This farmers market is the main way that we sell our produce.

Stan: That's great. Glad you are here. We noticed your prices are pretty low compared to some other stands.

Conventional Farmer: Yes, we try to get the most out of a small plot of land. By tailoring the fertilizer and water to each type of crop, we can produce a high yield in a really small area. That saves us money, since land is expensive, and we pass on those savings to consumers. Also, we work smarter instead of harder to get rid of weeds and insects. Can you imagine hand-pulling acres and acres of weeds? How much that would cost? Instead we use special herbicides that only harm the weeds, not the crops.

Joann: I can see how your efficiency might be good for the environment, in a sense, because the way you work takes a lot less land area than organic farming. That saves space for wildlife. But I'm worried about the herbicides and other pesticides. Won't they hurt us?

Conventional Farmer: Well, if you were to spray them directly on your skin or drink them from the bottle, then they might hurt you. But they wash right off the produce. Then you have clean, delicious food for half the price.

Stan: What about butterflies and other animals that get exposed to chemicals that kill bugs?

Conventional Farmer: What you won't hear from the organic industry is that they use pesticides too.

Stan: Oh wow, I didn't know that.

Conventional Farmer: Yeah, sometimes loads and loads of 'em, since they are less effective than synthetic pesticides.

Joann: Thanks for teaching us about farming and for pointing out some things that we didn't know.
[*She then turns to Stan as they leave.*] I feel like we have more questions than answers now. We'll have to do some research online later.

Stan: I agree. We have a lot to learn still. But I'm starting to feel like maybe it isn't worth the money to buy organic.

Joann: Really? I was thinking the exact opposite.



Question

In general, do you think the benefits of organic foods justify their higher prices? Explain your stance in a few sentences.

Part II – Researching Organic and Conventional Farming

When they returned home later that day, Joann and Stan collaborated on a list of questions that arose from their earlier conversations at the market. After compiling their list, they set off to find the answers on their own. Stan decided to look for evidence supporting his view that buying organic is not necessarily better for human health or for the environment, so it was not worth the money. Joann looked for evidence that organic crops are better for human and environmental health.

Questions

Your instructor will assign you to take either Stan's perspective (buying organic isn't worth it) or Joann's perspective (buying organic has benefits). As you use the internet to answer the questions below, consider evidence that supports your perspective.

Questions About Pesticide Use

1. How do weeds affect crop growth?
2. How do insect pests affect crop growth?
3. The organic farmer denies using synthetic pesticides, whereas the conventional farmer says that some organic farms use a lot of pesticides. Is it possible they were both telling the truth? What are the rules for pesticide use on organic farms?
4. Are "synthetic pesticides" bad for the environment? Are "natural pesticides" good for the environment? How do pesticides affect farm workers? If a synthetic pesticide is shown to be less toxic than a natural pesticide, should organic farmers be required to use the synthetic one? Explain your answer.
5. How do organic farmers manage insects, other than by using chemicals?
6. How do organic farmers manage weeds, other than by using chemicals?

Questions About Fertilizers

7. Why do synthetic fertilizers sometimes cause nutrient pollution in waterways? What is the result of this pollution?
8. How do organic farmers fertilize, if not with synthetic fertilizers? Can fertilizers from organic farms pollute waterways?
9. How does crop rotation help keep soils fertile?
10. If a conventional farm were converted to an organic farm, would it require more land area to produce the same amount of food?
11. What are some pros and cons of using manure or manure-based compost?

Questions About Harvested Crops

12. Do pesticide residues on fruits and vegetables harm people?
13. Are organic crops more nutritious than conventional crops?
14. Is there any evidence that people can taste the difference between organic and conventional crops?
15. Do organic farming regulations allow organic farmers to grow genetically modified organisms (GMOs)? Do scientists and consumers consider GMOs to be safe or harmful?
16. Is eating a conventional crop worse for a person's health than not eating fruits and vegetables at all?

Part III – Consider the Source

After gathering data from online sources, Joann and Stan each considered the credibility of what they had learned so far. After all, a good way to win the argument might be to discredit the counterarguments as coming from unreliable sites.

Joann: I feel like now I know a lot more about organic and conventional farming.

Stan: Me too. You know, it feels like both the organic farmer and the conventional farmer that we talked to at the farmers market just told us what they wanted us to hear. Then they got defensive when we started challenging them.

Joann: I suppose we can't blame them for casting themselves in a positive light.

Stan: But how can we know which online resources to trust? Could the websites we used have bias as well?

Joann: I think the conventional farming websites have the most bias.

Stan: Ha! Of course you do. The organic farming websites are totally full of bias.

Joann: I can hear the fear in your voice. You're gonna lose this debate.

Stan: Oh, it's *on!*

Questions About Credibility

1. Define *bias*. How do you know if a source has bias?

2. Do any conventional farming websites present biased information? Do any organic farming websites? Provide some examples of bias in sources that you encountered in your research.

3. For one of the biased sites you identified in Question 2, answer the following:
 - a. Who runs the website? Is it a company, a nonprofit organization, a government organization, an individual, a university, or another entity? From where do they get their funding?

 - b. What might the authors of the website have to gain from presenting biased information?

 - c. What can you do to verify or debunk the claims made on the site?

Part IV – The Debate

Now it's time to debate the merits of organic farming and conventional farming. First, students who researched organic farming should get together and compile their best talking points; likewise for those who researched conventional farming. The class should then be divided into groups of four, with two students equipped with research supporting organic farming and two having researched conventional farming. Within each group, opposing sides should sit facing one another. In Round 1 of the debate, students defending organic farming argue their points first. They have four minutes to make what they consider to be the best arguments in favor of organic farming; students defending conventional farming should listen and take notes but cannot interrupt. Then students defending conventional farming argue what they consider to be their most persuasive points for four minutes. Like before, students defending organic farming should listen and take notes but cannot interrupt.

After both sides have presented their arguments, students take three minutes to prepare to argue the opposing side, selecting the best arguments they heard in Round 1 of the debate; students who just defended conventional farming must shift to defending organic farming and vice versa in Round 2. The organic farming side goes first and talks uninterrupted for two minutes, summarizing the strongest arguments that the other pair made a few moments before. Then the conventional farming side talks for two minutes.

Once all students have argued for both sides of the issue, small groups should take five minutes to discuss the following questions:

- Is organic farming less likely to damage the environment than conventional farming?
- Is organic food more nutritious and less toxic for humans?
- And more generally, is buying organic worth the extra cost?

Once this discussion is over, each small group will present its views to the class, including major areas of agreement and remaining disagreements.

After the debate is over and groups have reported out, individually revisit the question you considered before the debate started: *In general, do you think the benefits of organic foods justify their higher prices? Explain your stance in a few sentences.*