

Do our Food Choices Matter? Reading

One day for lunch, you have the option of beef, chicken, or bean burritos. Does your choice of filling affect anything besides yourself? For example, does your choice affect the environment?



You can think of each of the ingredients in your burritos as coming to you from a chain of ecosystems. The ingredients are made from the ecosystem products of these ecosystems. We saw in Reading 5.2 that the cattle that produce the beef probably have lived on a cow/calf farm, a backgrounding ranch, and a feedlot. The grain and hay they eat come from yet other ecosystems, row crop farms like the one described in reading 5.3 and grasslands. The wheat flour used to make the tortillas, as well as the beans for the filling, also come from row crop farms. The cheese on your burritos comes from a different chain of ecosystems. The dairy cattle are born on a cow/calf farm and then moved to a dairy farm. Their diet is a mixture of hay, soybean meal, and grain from row crop farms. The dairy cows produce the milk that is processed off the farm to make cheese. The tomatoes and onions used in salsa for your burrito likely came from vegetable farms, or in the case of the tomatoes, perhaps a greenhouse ecosystem. The ecosystem chains that yield the main ingredients in the burrito are shown in the following pages.

Ecosystems managed by people

All of these ecosystems are managed by people to optimize their useful ecosystem products, namely the ingredients in our food. Like all of the ecosystems we have studied, these ecosystems transform carbon.

Food production and global climate change

As with all ecosystems, living organisms in the ecosystem chains that produce our food move carbon between inorganic and organic pools. Plants use carbon in the atmosphere in photosynthesis to produce organic carbon molecules. Either the plants or other living things

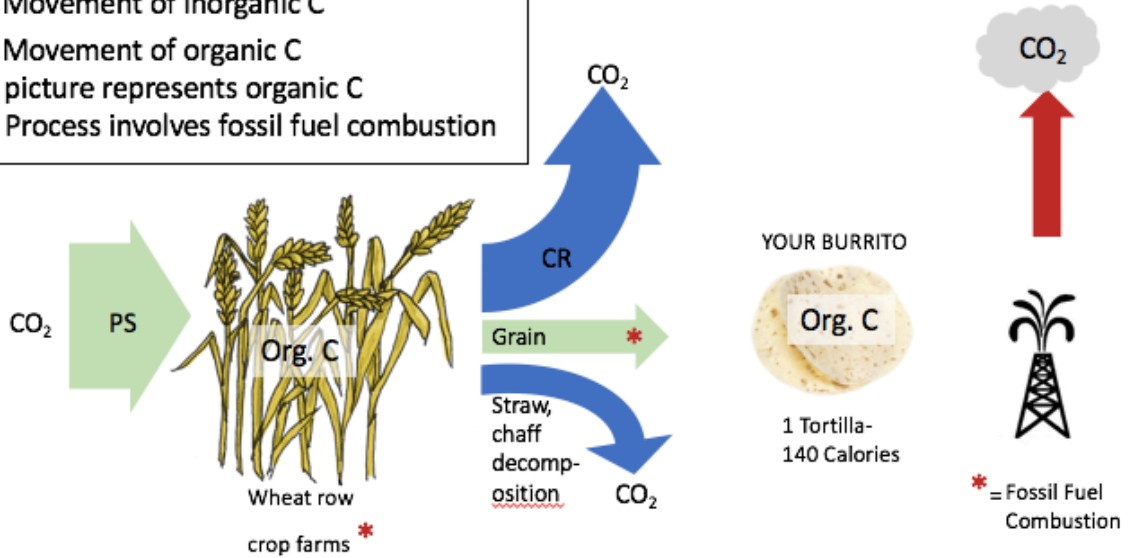
including humans use the organic molecules for cellular respiration or to add to their biomass. There is no net addition of carbon to the atmosphere from the living things in the ecosystems. However, carbon is moving for other reasons, too. Most of these reasons have to do with people using fossil fuels as energy sources. When people burn fossil fuels, carbon moves from the organic fossil fuel pool to the atmosphere. Fossil fuel carbon has been locked away from the atmosphere for millions of years. Burning fossil fuels increases the pool size of actively cycling carbon in the atmosphere. CO₂ from fossil fuel combustion is increasing in the atmosphere much more quickly than carbon can be sequestered in other pools. It is this net increase in atmospheric CO₂ levels that is contributing to global climate change. Processes that use fossil fuels are indicated with red *s in the diagrams below.

Discussion Questions

Look at the diagrams below. Which ecosystems are most like unmanaged ecosystems (such as forests or prairies) in the ways they transform carbon and in their carbon inputs and outputs?

Identify the processes (indicated with red *s) that require fossil fuel as energy sources. For example, in the wheat row crop farm the machinery that plants, fertilizes and harvests the wheat requires fossil fuels. Lots of fossil fuels are also required to manufacture the nitrogen fertilizer that is used on corn and wheat farms. What other processes rely on fossil fuels to get the food to your plate (see diagram)?

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 Each picture represents organic C
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