

Global Agriculture and World Hunger



NEWS UPDATE

- On February 24, 2022, Russia invaded Ukraine, and all of Europe became implicated. Ukrainian crops were destroyed, and Europe faced yet another massive migration crisis. As noted below, conflict has major effects on hunger and migration, and the impact will soon be known.

PURPOSE

This is the second of the chapters focused on global issues, and we consider agriculture in the United States and on the global scale. For the United States, we rely on the demand and supply model and consider the unique problems of American agriculture and an overview of U.S. agricultural policy. The chapter presents the opportunity to revisit the topic of inelastic demand and to address the subject of a price floor. It tackles the issues pertaining to the livelihoods of farmers, global agriculture more widely, and the problem of U.S. and world hunger. We consider the “Three Cs,” the circumstances that are so greatly worsening global poverty and hunger (they are the coronavirus pandemic, climate change, and conflict). (For instructors who feel that a more detailed discussion of elasticity will help their students understand farm issues, Appendix 10–1 discusses elasticity in greater detail. Appendix 10–2 covers target prices and deficiency payments.)

WHAT’S NEW?

1. As discussed in Chapter 9, world poverty and hunger are worsening due to the “Three C’s” just mentioned. The coronavirus pandemic, climate change, and violent global conflicts are destroying existing crops, preventing the planting of new crops, causing illness, and creating conflicts over scarce resources. Millions of people are currently threatened with starvation. These are sometimes worsened by U.S. food policies.
2. Loss of Indigenous land rights and U.S. government policies that denied farm loans to Black farmers worsened the U.S. distribution of wealth (land), which worsens the distribution of income. As President Biden sought to correct for former racism and discrimination, he was met with charges of reverse discrimination.
3. The coronavirus pandemic disproportionately harms the health of U.S. “essential workers,” which include farm workers in agricultural fields and workers in animal processing factories. These include large numbers of Hispanics and Blacks, as well as immigrants.
4. The pandemic also created hunger in the United States, and various policies (including an expansion of food stamps) were helpful in reducing hunger.
5. There is greater discussion of agribusiness, biotechnology, market power, and concentration, all of which will lead into Chapter 13 on market power.
6. There is policy discussion in terms of both the Trump and the Biden administrations. Trump’s trade policies were harmful to farmers, and Biden’s policies have been met with opposition in Congress.

7. Once again, Bread for the World is referenced as a source of information on legislation pertaining to U.S. and global hunger and poverty. The intent is not to promote Christianity but to make students aware of an excellent source of information.

TEACHING SUGGESTIONS

➤ *Student Interest*

- My university is located in a small town surrounded by relatively small farms. Many students come from farm families, and in many ways, farmers are the backbone of the community. When discussing U.S. agricultural policy, our students will be more interested in the kinds of farms they are familiar with. They will not appreciate critiques of agricultural policy that fail to differentiate between large and small farms or corporate and family farms. They will also appreciate being asked questions about their farm experience, whether it pertains to migrant labor, government subsidies, farm safety, and the difficulties and rewards of farming.
- Students will appreciate you referencing female farmers who play a large role in U.S. agriculture.

➤ *Controversy*

- U.S. agricultural policies benefit large farmers and corporate agribusiness at the expense of small U.S. farmers and small farmers in developing countries. These policies benefit the rich at the expense of the poor.
- Genetically modified organisms are controversial for many reasons, but they can especially harm the well-being of small, poor farmers in developing countries.

➤ *Economic Theory and Models*

- We use the demand and supply model for multiple purposes in this chapter. First, we demonstrate the short-run situation where the combination of an inelastic demand curve for agricultural commodities and a fluctuating supply curve (due to weather) result in a great deal of price fluctuation in the short run. We also demonstrate the long-run situation where a slowly rising demand curve (or no increase in demand) coincides with a greatly increasing supply curve, causing a long-term decline in farm prices.
- We also use demand and supply to demonstrate the relation between the price elasticity of demand and the impact of supply curve shifts on total farm revenue. (We show this in greater detail in Appendix 10–1.)
- Finally, we use the demand and supply model to show the effects of other policies, including 1) price supports (price floors), 2) U.S. supply restriction programs, 3) U.S. policies to increase the demand for agricultural products, and 4) target prices and deficiency payments in Appendix 10–2.

➤ *Data and Terminology*

- Updated data include the characteristics of the rural sector and, more specifically, the farm sector; agricultural productivity in countries around the world, the race and ethnicity of U.S. farmers, the number of people affected by U.S. and global hunger, and agriculture as a share of GDP of countries around the world.
- As always, the terminology used in tables is precise. You will probably want to carefully explain how agricultural productivity is measured by value added per agricultural worker and is expressed in constant 2010 dollars.

➤ *Fundamentals*

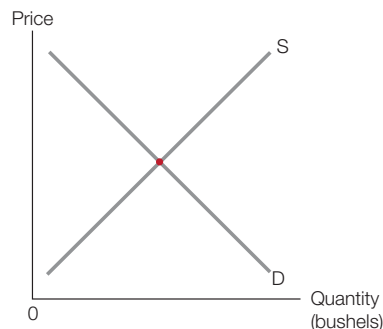
- U.S. agricultural policy that largely benefits large farmers and corporate agriculture; and policies that reduce the land rights of Indigenous people, the purchase of land and farming equipment by African Americans, and the exploitation of immigrant labor all serve to worsen the distribution of wealth and income.
- These same policies harm the well-being of racial and ethnic minorities by way of systemic racism. Racism is also present in the greater risk of the coronavirus among people of color who work in agriculture and meat packing. It was also present in the policies of the Trump administration to cut food programs and access to them by immigrants.

CLASSROOM EXERCISES

1. Graph the supply and demand data for sugar beets below. Make sure the demand curve is drawn relatively steep. Then show what happens to price, quantity, and producers' incomes if technological change shifts the supply schedule to the right by 3,000 units. What is the role of the price inelasticity of demand?

<u>Price</u>	<u>Quantity Supplied</u>	<u>Quantity Demanded</u>
\$15	12,000	6,000
12	10,000	7,000
9	8,000	8,000
6	6,000	9,000
3	4,000	10,000

2. If the demand for sorghum is inelastic and supply increases due to a bumper crop, what will happen to equilibrium price, quantity, and the overall income of producers of sorghum? Show graphically and explain in words.
3. Consider the wheat market below, and label the equilibrium point (E) within the graph. Label the equilibrium price (P) and quantity (Q) along their respective axes. Shift the curve to show the impact of rapid technological change over time in wheat production. Label the new equilibrium point (E') within the graph. Label the new equilibrium price (P') and equilibrium quantity (Q') along their respective axes. What happens to market equilibrium price? [It decreases.] What happens to the equilibrium quantity exchanged? [It increases.] Would you expect this to encourage farmers to leave the wheat industry? [Yes] Why has this not been the case? [Government supports keep them in farming.]



4. Draw supply and demand curves for oats. Label an effective price floor in the market. Remind students what it means to be “effective.” Label the quantity demanded [Q^D] and the quantity supplied [Q^S] of oats along the quantity axis. What is the problem that results? [Surplus] What must the government do to maintain the artificially high price of oats? [Buy and store oats] Is this efficient? [No] Keeping in mind that the concept of “fairness” is subjective, is this “fair” to the consumer? [No] Taxpayer? [No] Large farmer? [Yes] Small farmer? [No] Other small businesspeople? [No] Remind students that contrary to what they would like to see, price floors are “high” and price ceilings are “low” in the graphs.
5. Draw a demand curve (D) for millet, assuming that demand curve is relatively inelastic. Label the equilibrium point (E) within the graph. Now suppose that supply fluctuates from year to year due to changing weather. Show these supply shifts. What is the effect of demand inelasticity and supply fluctuations on the market price of millet? [Much fluctuation.] Show this on your graph.



SAMPLE TEST QUESTIONS

Multiple Choice Questions

1. A bumper crop will _____ supply and _____ the price of a farm product.
 - a. decrease, decrease
 - b. decrease, increase
 - c. **increase, decrease**
 - d. increase, increase
2. The demand for most farm commodities is:
 - a. growing more rapidly than supply.
 - b. **inelastic.**
 - c. decreasing over time.
 - d. a relatively flat downward sloping line.
3. If demand is inelastic and the price of the product decreases, overall producers' incomes will:
 - a. not change.
 - b. increase.
 - c. **decrease.**
 - d. cannot say from given information.

Answer the next two questions based on the following demand and supply schedules for wheat.

<u>Price</u>	<u>Quantity Supplied</u>	<u>Quantity Demanded</u>
\$6	100,000	50,000
\$5	80,000	55,000
\$4	60,000	60,000
\$3	40,000	65,000
\$2	20,000	70,000

4. Equilibrium price and quantity will be:
 - a. **\$4; 60,000.**
 - b. \$5; 60,000.
 - c. \$3; 40,000.
 - d. \$3; 65,000.

5. If the government supports the price of wheat at \$5, there will be a:
 - a. shortage of wheat.
 - b. surplus of 20,000 units of wheat.
 - c. **surplus of 25,000 units of wheat.**
 - d. shortage of 20,000 units of wheat.

6. A reason the government might establish price supports for wheat could be to:
 - a. get rid of a surplus of wheat.
 - b. increase the ability of poor families to afford bread.
 - c. increase U.S. farmers' ability to compete in international wheat markets by lowering the export price of wheat.
 - d. **increase the incomes of wheat farmers.**

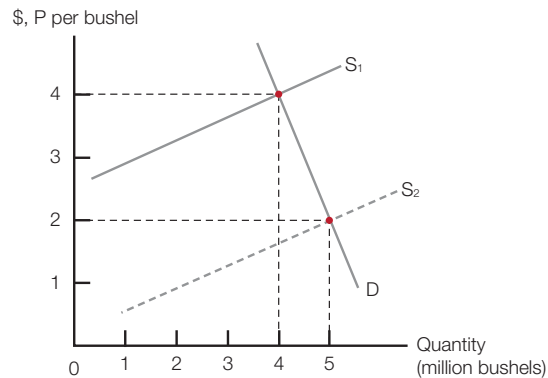
7. The largest share of government payments to farmers have gone to:
 - a. family farms.
 - b. growers of fresh fruit and vegetables.
 - c. **large farms and agribusiness.**
 - d. small farms.

8. The goal of government supply restriction programs has been to:
 - a. increase the amount of farm products exported by the United States.
 - b. decrease food prices for consumers.
 - c. **increase the price of farm products.**
 - d. increase U.S. demand for farm products.

9. Characteristics of agriculture include:
 - a. immobile resources.
 - b. extensive technological change in the long run.
 - c. inelastic demand over the short run.
 - d. **all of the above**

10. When we say that price supports interfere with the rationing function of price, we mean that price supports cause:
- too few resources to be allocated to farming.
 - persistent shortages.
 - persistent surpluses.**
 - the market to reach equilibrium too rapidly.
11. Which of the following is *not* used to increase the demand curve for U.S. farm products?
- Supply restriction programs**
 - Food stamps (SNAP)
 - School lunch programs
 - U.S. food aid to other countries
12. When demand is inelastic and bad weather causes crop failures for corn farmers so that the market supply of U.S. corn decreases substantially:
- the overall income of U.S. corn farmers will decrease.
 - the overall income of U.S. corn farmers will increase.**
 - almost all corn farmers go broke because of the crop failure.
 - the price of corn will fall to below the farmers' cost to produce it.
13. The inelastic demand curve for corn farmers means that if supply decreases,
- price will rise a lot.**
 - price will rise a little.
 - quantity will rise a lot.
 - quantity will rise a little.
14. Because there has been extensive technological change in agriculture over time:
- supply has not been able to keep up with demand.
 - supply has increased more than demand.**
 - the prices farmers receive for their products have increased in comparison to the prices of other products.
 - none of the above
15. When we say that price supports interfere with the rationing function of price, we mean that price supports:
- create shortages.
 - don't allow the price to fall to the equilibrium level, thus eliminating the shortage.
 - don't allow the price to fall to the equilibrium level, thus eliminating the surplus.**
 - shift the demand for agricultural commodities backward.

(Appendix 10-1) Answer the next three questions on the basis of the following graph for corn.



16. Initially assuming that the supply curve is S_1 , what is the total revenue to corn growers?
- \$16
 - \$16 million**
 - \$8 million
 - We cannot say from the given information.
17. Now assuming that supply changes to S_2 , what will be the total revenue to corn growers?
- \$20
 - \$10 million**
 - \$12
 - We cannot say from the given information.
18. On the basis of the changes in price and total income noted in the previous two questions (as well as the slope of the demand curve), we can say that the:
- supply of corn is inelastic.
 - supply of corn is elastic.
 - demand for corn is inelastic.**
 - demand for corn is elastic.
19. (Appendix 10-1) When supply increases, price will decrease by a greater amount the:
- the more elastic is demand.
 - the more inelastic is demand.**
 - the flatter is the supply curve.
 - the flatter is the demand curve.
20. (Appendix 10-2) Target prices differ from price supports in that:
- target prices indirectly subsidize both domestic and international buyers.
 - no surplus is created.
 - it is easier to calculate the cost of the policy than with price supports.
 - all of the above**

True / False Questions

1. More people live in the U.S. rural sector than in the urban sector. (F)
2. Most government benefits to farmers go to small farmers. (F)
3. Rural poverty rates are higher on average than suburban poverty rates. (T)
4. The demand for most farm commodities is inelastic. (T)
5. Because demand for farm products is inelastic, lower prices mean lower incomes for farmers. (T)
6. Argentina, Norway, and Iceland have the highest agricultural productivity as shown in the table in the text. (T)
7. “Dumping” is exporting a product at low prices, even below its cost. (T)
8. Poor African countries have among the lowest levels of agricultural productivity in the world. (T)
9. The government can increase the price of farm products by either increasing the supply or decreasing the demand for them. (F)
10. Virtually all farmers and farmworkers are non-Hispanic white males. (F)
11. Economic liberals are concerned about the fact that most agricultural subsidies go to larger farmers and agribusinesses. (T)
12. Controversy about funding for food stamps (SNAP) was part of the reason that a new farm bill failed to pass in 2018. (T)
13. U.S. hunger is largely due to people’s poverty. (T)
14. In recent years, world hunger has been largely due to people’s poverty. (T)
15. Resources used in agriculture are relatively immobile. (T)
16. Over time the price of farm products, compared to the price of other products, has increased. (F)
17. Hunger in the United States has largely been eliminated. (F)
18. Food aid has almost eliminated hunger in the world’s conflict zones. (F)
19. Price supports create shortages. (F)
20. Tariffs imposed by Donald Trump had the effect of harming U.S. farmers. (T)
21. Donald Trump’s policies were informed by his nationalist-populism. (T)
22. According to the text, genetically modified organisms will be the solution to world hunger. (F)
23. Based on the data in the text, the U.S. has the highest agricultural productivity in the world. (F)
24. U.S. agricultural subsidies harm poor farmers in developing countries. (T)
25. President Biden has sought to restore racial equity in farming. (T)
26. President Biden has sought to improve the nutrition of people of color but not of white people. (F)
27. Market power means a business firm can influence the market price of its product. (T)
28. (*Appendix 10–1*) With inelastic demand, the percentage change in quantity demanded is greater than the percentage change in price. (F)
29. (*Appendix 10–2*) Deficiency payments are calculated as the difference between the target price and the actual price received by farmers times the number of units sold by the farmers. (T)
30. (*Appendix 10–2*) Target prices result in lower agricultural prices. (T)

Critical Thinking Questions

1. World hunger is a complex issue with complex solutions. Under certain circumstances, food aid and U.S. subsidized agriculture can harm the world's poor. The same is true of genetically modified organisms and the practices of large agribusinesses in concentrated markets. Can you explain these issues?
2. World hunger had until recently been a problem of poverty. There was always enough food produced, but poor people couldn't afford to purchase it. In more recent times, the "Three C's" (coronavirus, climate change, and conflict) have threatened the availability of food. Discuss this issue in the context of the countries discussed in the text.
3. U.S. hunger is somewhat less complex. It is due to poverty. People cannot afford to buy from the abundance food. Similarly, people who live in low income and segregated residential areas often lack access to nutritious food. What can be done about these issues?
4. What is the viewpoint toward agriculture of the economic left and the economic right?
5. (*Appendix 10-2*) Price supports and target prices both can increase the income of farmers. But since price supports are minimum prices, below which price cannot fall, they create persistent surpluses. Target prices, on the other hand, do not create surpluses. Price is allowed to fall to the level that clears the market, and a subsidy in the amount of the difference between the target price and the actual price is paid on each unit the farmer sells. Both programs benefit farmers and cost taxpayers. The price support increases the price of food and thus hurts consumers, and the high price can also hurt our international competitiveness. The low price under a target pricing program acts as an indirect subsidy to consumers and encourages consumption. It is also an indirect subsidy to our farm exports, because it lowers the price of agricultural commodities. Both programs provide larger benefits to larger farms, because payments are based on the quantity of production. Which of these is the better program? Should we even have these two programs?