

Take-home Practice Opportunity 4

Due date: October 20, 5:00 p.m.

La. seafood safety testing results go online

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BATON ROUGE, La. (AP) - Louisiana officials want to wipe out the stereotype of tainted shrimp, crab and fish dirtied by oil and chemicals from last year's Gulf oil spill. So, they're putting reams of data and test results on a new web site they hope will prove to restaurants and consumers that the state's oysters, shrimp and fish are safe for consumption.

The web site is at www.gulfsource.org. It shows data collected by the Louisiana departments of wildlife and fisheries, environmental quality, health and hospitals, and agriculture and forestry. Wildlife and Fisheries Secretary Robert Barham says of more than 2,100 samples over the last year, no sample of seafood, water or sediment has tested near the federally-established "level of concern." The testing is paid through an \$18 million grant from BP after the oil spill.

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You wish to analyze the potential impacts that increased information to consumers can have on the shrimp and related markets. You know that the shrimp market is related to the market for mussels, oysters, grits, and income. The function characterizing the demand for shrimp is as follows:

$$D_{shrimp} : Q_{shrimp}^D = 1000 - 2.5P_{shrimp} + 0.25P_{mussels} + 1.2P_{oysters} - 4P_{grits} + 0.01I$$

Prices for these commodities and income are as follows:

$$\begin{aligned} P_{shrimp} &= \$700/\text{hundredweight} \\ P_{mussels} &= \$300/\text{hundredweight} \\ P_{oysters} &= \$1000/\text{hundredweight} \\ P_{grits} &= \$100/\text{hundredweight} \\ I &= \$30,000 \end{aligned}$$

You also know that the price elasticity of shrimp supply is $\varepsilon_{shrimp}^S = 0.9$.

1. What is a likely outcome in the shrimp market from increased information about Louisiana shrimp? Why?
2. Using a supply and demand diagram, illustrate the impacts.
3. Suppose that the market response that you described will happen in (1) is 10%. What will be the quantitative effect on the price, quantity demanded, and quantity supplied of shrimp? *Assume that you are only examining the shrimp market, disregarding the other factors.*
4. Suppose that simultaneously to the impact in (3), there is a major hurricane that causes Louisiana shrimp farmers to lose a quarter of their shrimping boat fleet. In response, there is a 15% shock to the shrimp market. What will be the quantitative effect on the price, quantity demanded, and quantity supplied of shrimp? *Assume that you are only examining the shrimp market, disregarding the other factors.*
5. You now wish to repeat the analysis in (3), but incorporate information about other commodities.
 - (a) Suppose that you are using information about the relationship between *shrimp* and *mussels* markets. In addition to the information you can gather using the shrimp demand function, you discover the cross-price elasticity of mussels with respect to changes in the prices of shrimp is $\varepsilon_{mussels,shrimp}^D = 0.5$, the own-price supply elasticity of mussels is $\varepsilon_{mussels}^S = 0.75$, and the own-price demand elasticity of mussels is $\varepsilon_{mussels}^D = -2.25$. What will be the quantitative effect on the price, quantity demanded, and quantity supplied of shrimp and of mussels? *Assume that you are only examining the shrimp and mussels markets, disregarding the other factors.*
 - (b) Why do the results in (5a) differ from the results in (3)? What new information are you incorporating in (5a) relative to (3)?
 - (c) Suppose that you are using information about the relationship between *shrimp* and *grits* markets. In addition to the information you can gather using the shrimp demand function, you discover the cross-price elasticity of grits with respect to changes in the prices of shrimp is $\varepsilon_{grits,shrimp}^D = 1.25$, the own-price supply elasticity of grits is $\varepsilon_{grits}^S = 3$, and the own-price demand elasticity of grits is $\varepsilon_{grits}^D = -5$. What will be the quantitative effect on the price, quantity demanded, and quantity supplied of shrimp and of grits? *Assume that you are only examining the shrimp and grits markets, disregarding the other factors.*