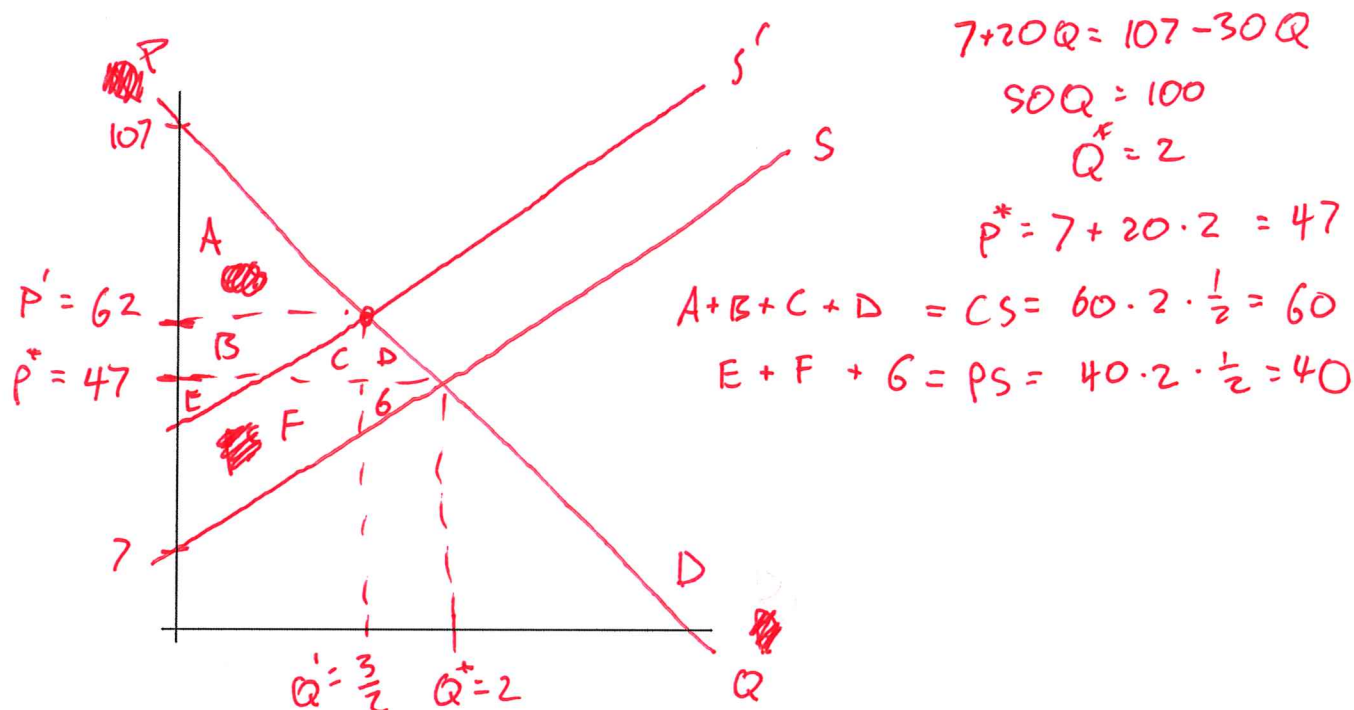## *Vignette B3*

Imagine a pandemic forces the world into a global lockdown and subsequent slow reopening. Imagine the market for food (as a bundle) is represented by the following supply and demand curves before the pandemic *(units in dollars and daily servings)*.

$$P = 7 + 20Q_s \tag{1}$$

$$P = 107 - 30Q_b \tag{2}$$

Q1. Use a graph *(below)* and a sentence to discuss the food market prior to the pandemic. Be sure to calculate equilibrium price, quantity, consumer surplus, and producer surplus.

Graph annotations:
- $7 + 20Q = 107 - 30Q$
- $50Q = 100$
- $Q^* = 2$
- $P^* = 7 + 20 \cdot 2 = 47$
- $A + B + C + D = CS = 60 \cdot 2 \cdot \frac{1}{2} = 60$
- $E + F + G = PS = 40 \cdot 2 \cdot \frac{1}{2} = 40$
- $P' = 62$, $P^* = 47$
- $Q' = \frac{3}{2}$, $Q^* = 2$

Q2. The pandemic substantially disrupted the supply chain, leading to difficulty bringing food to market with a new supply curve below. Use the graph *(above)* to discuss the impact of supply chain distruptions on the market. Be sure to include how welfare measures have changed.

$CS' = A$

$\Delta CS = -B - C - D$

$PS' = B + E$

$\Delta PS = B - F - G$
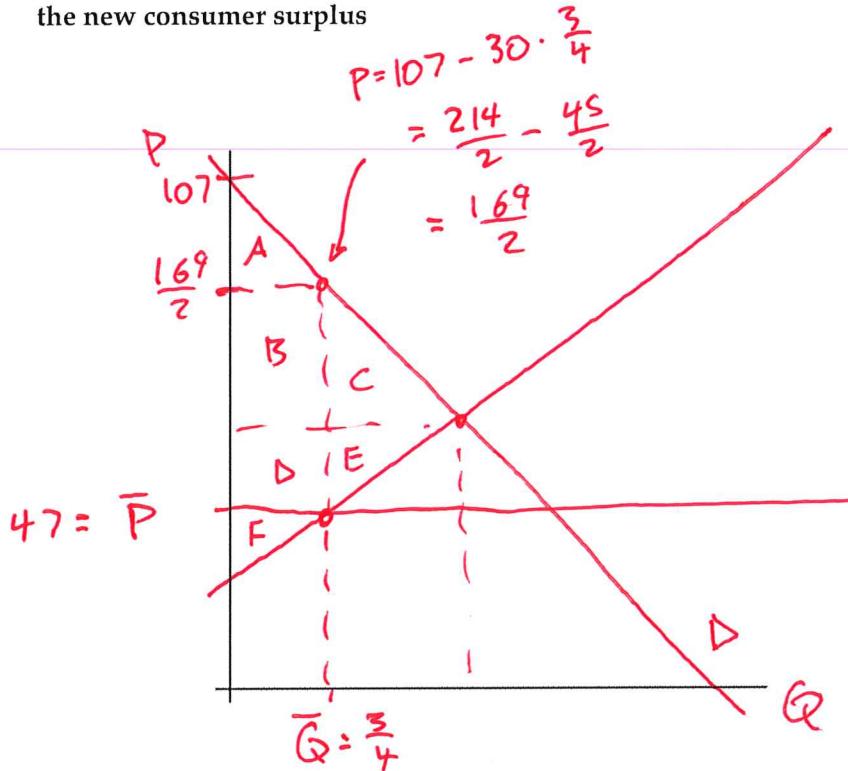
$$P = 32 + 20Q_s \tag{3}$$

$107 - 30Q = 32 + 20Q$

$50Q = 75$

$Q'^* = \frac{3}{2}$

$P' = 107 - \frac{90}{2} = 107 - 45 = 62$

Q3. Concerned with the affordability of food, the government considers a ban on price hikes from pre-pandemic levels. Use a graph to discuss the impact on good availability of this policy. Show welfare measures and calculate the new consumer surplus

$$P = 107 - 30 \cdot \frac{3}{4}$$

$$= \frac{214}{2} - \frac{45}{2}$$

$$= \frac{169}{2}$$

$$CS = A + B + D$$

$$PS = F$$

$$47 = 32 + 20\bar{Q}$$

$$15 = 20\bar{Q}$$

$$\boxed{\bar{Q} = \frac{3}{4}}$$

just write it out

$$CS = \left(107 - \frac{169}{2}\right) \cdot \frac{3}{4} \cdot \frac{1}{2}$$

$$+ \left(\frac{169}{2} - 47\right) \cdot \frac{3}{4}$$

Graph labels: P, 107, $\frac{169}{2}$, A, B, C, D, E, $47 = \bar{P}$, F, S', D, Q, $\bar{Q} = \frac{3}{4}$

Q4. If in addition to the supply chain disruptions, consumers were willing to spend more on food as government programs like unemployment benefits and employee protections supported incomes. Use a graph to discuss what happened to the market price and quantity after both shocks and in the absense of price controls.
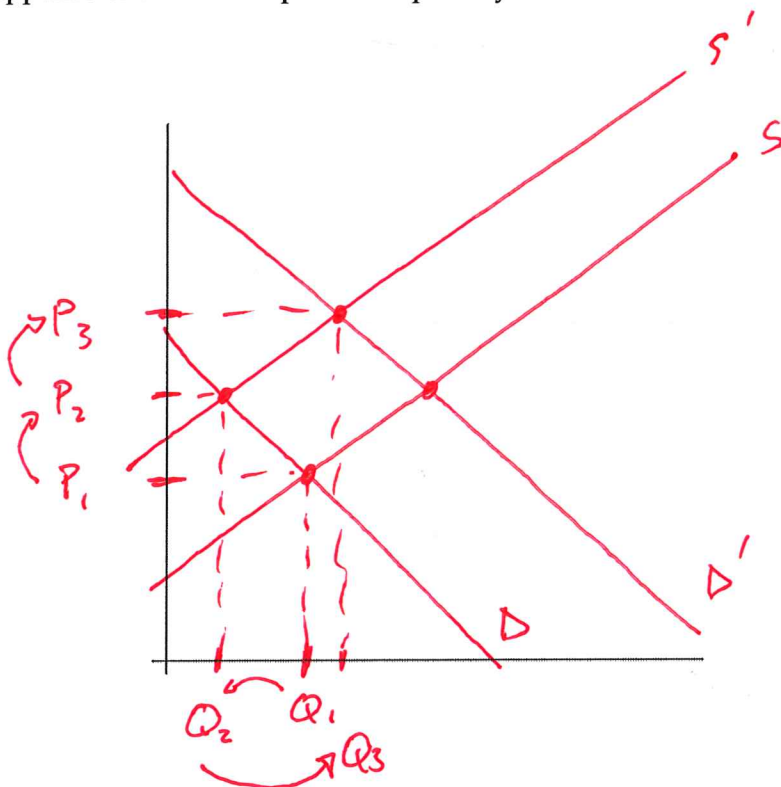
Prices went up due to both shifts.

Quantity would go up after the demand shift but would go down after the supply shift.

So the Quantity shift is indeterminant.

Graph labels: S', S, P_3, P_2, P_1, D, D', Q_2, Q_1, Q_3