Hypothetical

A. Traditionally, poultry farmers feed their chickens a diet based on soybean meal or corn meal. In recent years, some farmers have begun to substitute insect-based protein for traditional soybean meal or corn meal.

B. Assume that a group of poultry farmers has begun to feed their chickens insect-based protein where the insects are raised on food waste. The insect-based feed is significantly less expensive than soybean meal or corn meal and the farmers like the idea that using insect-based feed is "green" because it diverts food waste from landfills and produces protein with a much smaller environmental footprint than soybean meal.

C. Assume also, though, that the food waste used to feed the insects is contaminated with heavy metals and PFAs, which bioaccumulate in the insects and transfer into the animal products from animals fed on the insect-based protein.

   1. As a result, studies are showing that eggs from chickens raised on insect-based protein (when the insects are raised on food waste) have high levels of heavy metals and PFAs.

   2. Long-term exposure to heavy metals can cause cognitive impairment, kidney and liver damage, bone demineralization, and increased cancer risks.

   3. Long-term exposure to PFAs can cause elevated cholesterol levels, reproductive harm, and increased risk of some cancers.

D. Assume that the poultry farmers have only been using the insect-based protein for the past year, but they have found that it reduces the cost of raising their poultry by half. As a result, they have doubled the profits on the eggs that they are selling.

E. Consider the advantages and disadvantages of addressing the problem above through the four approaches discussed in the text (i.e. regulation, market forces, liability and insurance)