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Safeguarding Consumers through Minimum Quality Standards

Milk Inspections and Urban Mortality, 1880–1910

By D. Mark Anderson, Montana State University; Kerwin Kofi Charles, Yale School of Management; Michael McKelligott, Harris School of Public Policy, University of Chicago; and Daniel I. Rees, Universidad Carlos III de Madrid

Economists have a long-standing interest in government-mandated quality inspections. Government inspections incentivize adherence to minimum quality standards (MQSs) and are viewed as remedying problems resulting from buyers knowing less about products than sellers. However, inspections could restrict output and raise prices, thus hurting economically vulnerable consumers.

Many goods and services are subject to MQSs and government inspections. For instance, restaurants in the United States are periodically inspected by local, county, or state health departments, while meat and poultry shipped across state lines must be inspected by the Food Safety and Inspection Service. Quality inspections are supposed to offer protection against the unwitting purchase of unhealthy or even dangerous products, but previous research has often focused on code violations or inspection scores, neither of which is necessarily related to consumer health or safety.

Our research examines the effects of milk inspections, which were undertaken by most major American cities in the 1880s and 1890s, on two health-related outcomes of obvious importance to consumers: infant mortality and mortality from waterborne and foodborne diseases (hereinafter referred to as "waterborne diseases"). Before the advent of milk inspections, the milk supply of American cities was regularly diluted with (potentially contaminated) water and skimmed, and boric acid was often added as a preservative. Although consumers occasionally complained about the use of boric acid, public health experts were particularly concerned about dilution and skimming, both of which reduced the nutritional value of milk. To curb these practices, municipal inspectors were tasked with collecting

Editor, **JEFFREY MIRON**, Harvard University and Cato Institute.

and analyzing milk samples. Dairymen, dealers, and retailers who were caught peddling substandard milk were fined and their product was spilled onto the ground.

Buyers of milk in the last decades of the 19th century plausibly could not determine the quality of milk before purchase or perhaps even after purchase and consumption. Milk inspectors, with the help of a lactometer, measured the percentage of solids in milk to determine whether it was watered or skimmed. Consumers, on the other hand, could not easily ascertain the quality of milk because caramel, dyes, salt, and sugar were added to restore its color, body, and taste. If an infant or child ingested milk to which contaminated water had been added, linking an infection back to its original source would have been impractical, if not impossible.

Today, health and safety regulations are typically complex and multilayered, making it challenging to credibly estimate the effect of any one facet of regulation. By contrast, urban milk markets were wholly unregulated before the hiring of municipal inspectors. Requirements that milk meet bacteriological standards, which encouraged pasteurization, and requirements that dairy cows be tested for tuberculosis were post-1900 phenomena. Moreover, the supply chain was, by modern standards, exceedingly short and simple. The milk was transported from nearby farms on wagons or trains in the morning and then sold—and typically consumed—within a day or two.

Milk inspectors were tasked with enforcing a minimum threshold for milk solids (fat, carbohydrates, and minerals), typically set at 12 percent. Using mortality data from 35 U.S. cities for the period 1880–1910, we find little support for the hypothesis that enforcing this well-defined MQS through premarket inspections reduced infant mortality. By contrast, when we shift our focus to waterborne diseases such as diarrhea and typhoid, there is strong evidence that enforcing an MQS through inspections led to better health outcomes. Five years after their start, milk inspections are associated with a 12 percent reduction in mortality from waterborne diseases; after more than 10 years, inspections are associated with a 19 percent reduction in mortality from waterborne diseases. It is likely that inspections reduced waterborne mortality by discouraging dairymen, dealers, and retailers from diluting their milk with water, which was all too often demonstrably contaminated with typhoid or other potentially harmful bacteria, such as *Escherichia coli*. However, because many typhoid outbreaks at the turn of the 20th century were linked to the handling of milk by infected dairy workers, we cannot dismiss the possibility that inspections reduced waterborne mortality through curbing the sale of skimmed milk.

By the 1880s, physicians were recommending that milk be heated at home to destroy microscopic pathogens, and it is possible that the public discourse surrounding the hiring of milk inspectors encouraged this practice. To explore whether household efforts to sterilize milk can explain the negative relationship between milk inspections and waterborne mortality, we turn to diphtheria mortality. Diphtheria can be transmitted through the consumption of raw dairy products but not through water; the bacteria that cause diphtheria are easily destroyed by heating. We find no evidence that milk inspections reduced diphtheria mortality, suggesting that the strong negative relationship between milk inspections and mortality from waterborne diseases is not driven by household efforts to sterilize milk through heating.

Our results are directly relevant to ongoing policy debates regarding MQSs and their effects on consumer welfare. If quality can be accurately assessed before purchase, MQSs do not help consumers. There is, however, a stronger case to be made for MQSs if quality cannot be easily assessed before or even after purchase. Previous studies provide evidence that, when applied to production inputs, MQSs restrict supply and increase prices. Our study is the first to provide evidence that MQSs can improve consumer health when they are applied to goods for which it is difficult to assess quality prior to purchase.

NOTE

This research brief is based on D. Mark Anderson et al., "Safeguarding Consumers through Minimum Quality Standards: Milk Inspections and Urban Mortality, 1880–1910," NBER Working Paper no. 30063, July 2022.