

# Celebrating Mary Engle Pennington: A Pioneer in Food Safety and Preservation



Industry Specialty Team | March 2025

How often do you open the refrigerator for eggs, milk, or poultry? And how often have you had an encounter with salmonella? If not, you can thank Mary Engle Pennington (1872–1952). Mary was a trailblazing scientist whose revolutionary work in food safety and preservation reshaped the food industry and improved public health. Her legacy reminds us of the transformative power of women in science and their enduring impact on society.



## Early Life and Education

- Mary's lifelong interest in science began at age 12 when she was captivated by a book on medical chemistry
- While Mary studied chemistry at the University of Pennsylvania, she only received a certificate of proficiency despite completing bachelor's degree requirements, as the university didn't grant degrees to women
- Undeterred by gender bias and supported by key faculty that instituted a rarely-used university statute, Mary earned a Ph.D. in chemistry from the University of Pennsylvania in 1895 at just 22 years old



## Career Highlights

- Founded the Philadelphia Clinical Laboratory and later led the city's Department of Health bacterial lab, focusing on improving milk safety standards
- Discovered bacteria in pushcart ice cream and educated vendors, reducing illness outbreaks among schoolchildren
- Joined the U.S. Department of Agriculture's Bureau of Chemistry (later known as the FDA) in 1905
- Appointed as the first female lab chief in 1907 using the gender-neutral name "M.E. Pennington" to bypass discrimination in her application and future work



## Innovations in Food Safety and Preservation

- Established standards for safe chicken processing from slaughterhouse to consumer
- Developed and implemented sanitary methods for processing, storing, and transporting milk
- Improved slaughter methods, including a technique that made chickens easier to pluck and reduced bacterial growth
- Instituted basic standards for sanitary egg handling and invented the modern egg crate for safer transport
- Developed a process for scaling, skinning, quick-freezing, and dry-packing fish immediately after being caught
- Demonstrated that keeping fresh foods at a constant low temperature extended shelf life and reduced bacterial growth
- Improved cold storage rooms and refrigerated railway cars
- Discovered the crucial link between humidity and food preservation during World War I



## Legacy

- Impacted millions of lives by transforming the food industry and modern supermarkets, enabling year-round availability of fresh and frozen foods while improving food safety and shaping contemporary dietary habits
- Received several patents for food safety innovations, including one for a poultry-cooling rack and another for a method for freezing eggs
- Awarded Notable Service Medal in 1919 for her work on safe food transport to American troops during World War I
- Recognized by the American Society of Heating, Refrigeration and Air-conditioning Engineers (ASHRAE) as the American authority on home refrigeration in 1923
- Elected Fellow by American Society of Refrigerated Engineers in 1949
- First woman elected to Poultry Historical Society Hall of Fame in 1959



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Sources: FDA, Wednesdays Women, The Penn Gazette, Invent, FarmHER, Encyclopedia