



New York State Cattle Health Assurance Program
Mastitis Module Fact Sheet

*The Dairy Industry and Its Public
Health Implications*

Milk is a near perfect food for humans, other mammals, and wide variety of microbes. The microbes which luxuriate in milk are divided into two groups: those that degrade quality – the spoilage organisms; and, those that in addition to adversely impacting quality, produce infection and disease following their ingestion – the pathogenic organisms. This latter group has long been a major public health concern.

As early as the 1500's public health authorities postulated a linkage between milk consumption and the occurrence of human illness. Ironically, it was the spoilage organisms that provided the impetus for development of the single most effective public health practice used to control milkborne diseases.

In 1854, Louis Pasteur noted that heating delayed the spoilage of wine. By 1857, he had demonstrated a similar effect using milk and the process bearing his name was born: pasteurization. This led to the eventual development of the Pasteurized Milk Ordinance.

By the late 1800's, the efficacy of pasteurization as a public health measure was widely recognized in both Europe and the United States. In Denmark, pasteurization was extended to include milk fed to calves as part of a national tuberculosis control program. By the beginning of the new century, larger municipalities – Chicago in 1908, New York City 1914 – made pasteurization of commercial milk supplies mandatory and established sanitation standards for farms and processing plants.

At the national level progress toward uniform standards was much slower, and as late as 1939, the Standard Milk Ordinance & Code – forerunner of the Pasteurized Milk Ordinance -- modestly suggested that pasteurization was “highly recommended”. Without national leadership and coordination, milkborne disease outbreaks continued to be reported at unacceptably high rates: eight times more frequent than waterborne outbreaks from 1939 to 1950.

Fortunately, in 1952 The National Conference of Milk Shippers was formed to promote uniformity and reciprocity across the entire country. With support from Federal and State agencies, and a boost from national programs to control tuberculosis, brucellosis, and mastitis the frequency of milkborne disease has been reduced substantially, and the diseases that set the process in motion a century ago – tuberculosis, brucellosis, scarlet fever, diphtheria, septic sore throat, and various gastrointestinal maladies – have all been marginalized. Unquestionably, congratulations are in order, but complacency is not.

Over the last quarter century, a new group of microbes collectively named “ The Emerging Pathogens” by the Center for Disease Control [CDC] have steadily gained prominence. This group includes organisms that are quickly becoming household names: *Listeria monocytogenes*, *E. coli* 0157:H7, *Campylobacter jejuni*, *Yersinia enterocolitica*, *Salmonella typhimurium* DT 104 *Cryptosporidium parvum*, *Giardia* sp. and *Coxiella burnetti*. These diseases represent a significant threat to the dairy industry. They are a threat to the health,

well-being and productivity of the farm animals, to the individuals working on the farm who may consume raw milk or otherwise become exposed to unknown microbial hazards and the general population of people consuming dairy products and exposed to an environment that is potentially contaminated with these organisms.

Some medical researchers suggest that the microorganism that causes Johne's Disease in cattle, *Mycobacterium avium paratuberculosis (Map)*, may play a role in Crohn's disease, a chronic inflammatory intestinal disease in humans. Results of studies have been contradictory, and uncertainty about the public health risk of *Map* persists. *Map* can be shed in milk and there has been conflicting studies demonstrating the effectiveness of pasteurization in killing *Map*. Nonetheless, the concern has encouraged the dairy and beef industries and the government to direct more attention toward controlling Johne's disease and evaluating the safety of milk and beef products.

As a new Millennium begins, the dairy industry faces this paradox: product quality and sanitation have never been higher, yet the need for strict sanitation, in all its contexts, has never been more critical. The same may be said, for on-farm biosecurity practices, and measures that reduce animal

stress and promote disease resistance. Consumers expect and should have available the highest quality and safest food producers can supply. Consumers are more cognizant of health issues than ever before and look to the dairy industry to be proactive in providing safe, wholesome foods.

Regulatory agencies responsible for protecting public health and environmental quality are also concerned with these emerging diseases. It falls within agency purview to prevent and control these diseases. Current policy requires that they follow food borne disease outbreaks to their origin, which may be the farm gate. Water runoff and environmental contamination by these pathogens threatens surface water quality.

Introduction of zoonotic disease organisms into a herd is a constant threat to the well being of the animals and economic health of the farm. Awareness of the potential for zoonotic disease to exist on a farm; knowledge of the farm specific risk factors associated with disease and the development and implementation of a biosecurity plan is a responsibility of each and every dairy and livestock producer. Consumer confidence in the food they eat and the industry that manufactures that food is the backbone of maintaining a healthy, expanding market for milk and dairy farm products.