

NEW WESTMINSTER
2011
Dairy Pathology

Affidavit of Dr. Theodore Beals #1
Sworn January 4, 2011

No. S-124618
New Westminster Registry

IN THE SUPREME COURT OF BRITISH COLUMBIA

BETWEEN:

FRASER HEALTH AUTHORITY

PETITIONER

AND:

ALICE JONGERDEN carrying on business as
HOME ON THE RANGE, JANE DOE and JOHN DOE

RESPONDENTS

AFFIDAVIT

I, Dr. Theodore F. Beals, of Grass Lake, in the County of Jackson, in the State of Michigan, in the United States of America, MAKE OATH AND SAY AS FOLLOWS:

1. I am an expert in pathology including food safety and the biological and health related aspects of dairy production, and as such I have personal knowledge of the facts and matters hereinafter deposed to, save and except for information imparted to me by other people, in which case I believe the source of the information to be reliable and I believe the information to be true,
2. I earned by Bachelors of Science, Masters of Science and M.D. from the University of Michigan in 1956, 1957 and 1966, respectively. I have been licensed to practice medicine in the State of Michigan since 1967. I completed 5 years of specialized residency training in pathology at the University of Michigan in 1971, and I am specialty certified in Anatomic Pathology by the American Board of Pathology, which includes Canada. I am widely published, and I have been a member or officer of more than 20 professional organizations.
3. A copy of my curriculum vitae is attached to this affidavit as **Exhibit "A"**.

4. I have prepared a report dated January 4, 2011, which sets out my opinion on the relative risks to human health posed by fresh unprocessed whole fluid milk (subsequently referred to as raw milk intended for human consumption), and on the existence of viable and alternative methods of regulating raw milk so as to protect the public wellbeing short of outright prohibition.

5. In the context of milk for human consumption, my experience in pathology deals with microbiology, testing and cellular aspects of disease. I have been qualified to give expert opinion evidence in Court dealing with pathological, biological and health related aspects of dairy, including court cases in California and Ontario. A copy of the transcript of my testimony in the California case is attached as **Exhibit "B"** and a copy of the transcript of my testimony in the Ontario case is attached as **Exhibit "C"** to this affidavit. I adopt my testimony as set out in those transcripts as true and accurate.

6. Throughout history fresh milk from animals has been consumed by huge populations of people in many cultures across the world. If milk had been inherently dangerous, it would have been eliminated from the general diet in the time long before pasteurization was discovered. In fact fresh and fermented milk have been the staple of many of the highly successful cultures over the history of civilization.

7. In regard to public health there is no science-based necessity for pasteurizing fresh raw milk intended for human consumption. Non-pasteurized milk produced with the intention of human consumption in the fresh state is legally available in 28 States in the United States of America, is widely and lawfully available throughout the European Union and its member countries, and is available in the United Kingdom with the exception of Scotland. With the exception of Canada, every member of the G8 group of countries has made provision for the lawful production, distribution, and consumption of unpasteurized milk. In these countries, unpasteurized milk is often referred to as "fresh milk" rather than "raw milk".

8. Generally speaking countries and states that allow sale of both unpasteurized and pasteurized milk create two separate regulatory streams. The first stream for fresh unpasteurized milk imposes standards for lactating animal health and hygiene and for sanitation at milking and bottling facilities. Testing for herd health is required as well as regimens for routine testing of milk samples to monitor the quality of the milk and for the presence of possible pathogens.

9. The intent within the first regulatory stream is to optimize the nutritional and microbiological value of the fresh milk while minimizing the risks to consumers. These regulations are intended to balance benefits with acceptable risk to the general public. The risks for properly regulated fresh raw milk and milk products fall within the acceptable range of risks for other food products and are considered minimal or trivial throughout most of the world. In my opinion, properly regulated raw milk produced specifically for human consumption in the fresh unprocessed form does not impose substantial health risks to the general public.

10. The second stream of milk production is a separate regulatory stream for pasteurized milk, which is widely referred to within the dairy industry as "industrial milk". In this affidavit, I use the term "industrial milk" to include milk that is intended for pasteurization (pre-pasteurized industrial milk) as well as milk that has already been pasteurized (pasteurized industrial milk).

11. Pasteurization is an industrial process that involves complex processing of milk by controlled heating for a period of time. Two of the commonly used temperature/time standards expose the milk to 145 degrees F (62.8 degrees C) for half an hour or 163 degrees F (72.8 degrees C) for 15 seconds. Industrial milk pasteurization was introduced and continues to be used to prolong the self-life of the milk for marketing purposes. It is also necessary if the milk is homogenized, since milk that has been homogenized quickly becomes unmarketable. Regulations in the second stream is tailored to the pasteurization process. The pasteurization process is designed to significantly reduce the bacterial content of the milk,(including any pathogens) that enter the milk though the cow or after the cow is milked through the factory farming and transportation processes. Pasteurization also significantly reduces the number of the beneficial organisms and alters the organic substances that are contained in milk, including enzymes, immunologically active components and vitamins. Pasteurized milk contains the non-living biomass of thousands of micro-organisms, including dead pathogens and altered proteins, enzymes, vitamins and other biologically important components.

12. The enzyme lactase converts lactose (milk sugar) into two simple sugars that can be easily absorbed from the intestine and utilized in our normal physiological processes (makes lactose bioavailable). In many humans the normal production of lactase by cells lining our small

intestine declines as we grow older. The decline in production of lactase is genetically/ethnically variable. Many humans become unable to fully digest lactose within their small intestine as they mature. A condition commonly referred to as lactose intolerance results from the consequences of undigested lactose entering the large intestine. Lactose, undigested in the small intestine passes through to the large intestine where among other things, is digested by resident microorganisms resulting in by-products that can cause abdominal pain, gas production, and diarrhea. There is a great deal of personal variability in reaction to the lactose that remains undigested in the small intestine with some individuals reacting badly to even small amounts of residual lactose, some able to accommodate moderate quantities, and some able to consume large quantities of milk and other dairy products without the symptoms of lactose intolerance. .

13. It is estimated that 30 to 50 million Americans are lactose intolerant, including 75 percent of Native Americans and African Americans, and 90 percent of Asian Americans. Lactose intolerance is less common among those descended from northern Europeans. There is no reliable way to prevent or reverse the condition.

14. Many individuals who have been diagnosed as lactose intolerant are able to drink fresh unprocessed milk without having the symptoms they had with ordinary milk that they obtain at the grocery store.. Many of these individuals really want to drink milk and an increasing number have found that if they obtain their milk fresh from the farmer in the unprocessed form, they can return to the joys of drinking milk.

15. The regulations that have developed over decades of application to the dairy industry are specifically designed for the production of pasteurized and homogenized milk processing. In those few countries that do not allow for production of milk in the fresh unprocessed natural form, there is no experience with determining standards that apply to the fresh unprocessed product. It has been well established that pre-pasteurized milk (in the publications referred to as "raw milk") has a significant prevalence of bacteria related to the forms that are associated with human illness. These include the groups: *Campylobacter jejuni*, *Escherichia coli* serotype O157:H7, *Listeria monocytogenes*, and salmonella spp. Advocates for banning raw milk argue that because of this prevalence it is risky to drink industrial milk prior to pasteurization (pre-pasteurized milk). Even so large numbers of farm families consistently drink this milk (well

documented even from farms with significant prevalence of “pathogens” in their milk) without becoming ill. This is presumed to be because through constant contact with the pathogens on their farm, from their animals, and in their farm tank milk, they have developed immunity. I do not recommend consumption of industrial milk prior to pasteurization for the general public.

16. The prevalence of the pathogen groups listed in #14 is well documented to be significant in industrial milk that is being shipped to pasteurization facilities (pre-pasteurized milk). However, I have analyzed hundreds of laboratory reports from numerous dairies in North America that are producing fresh unpasteurized milk intended for human consumption. My analysis shows that finding these same pathogens in this different product are consistently extremely rare.

17. Studies have shown that pasteurization tends to make it more difficult for consumers to absorb the calcium in milk. Each of the following beneficial components of milk are altered, reduced or eliminated from milk that has been pasteurized: lactoferrin, lactoperoxidase system, lysozymes, bovine immunoglobulins, milk proteins, cell mediated immune mechanisms, vitamin factors that assist in absorption or action of vitamins, and xanthine oxidase.

18. In fresh milk, there are large numbers of beneficial bacteria including lactic acid-producing bacteria capable of fermenting lactose. The resulting acidity in turn prevents or slows the growth and multiplication of many of the pathogen groups. During pasteurization however, these lactic acid bacteria are mostly destroyed. Because of this, in addition to the numerous other changes caused by the pasteurization process, this milk tends to be a more hospitable environment for micro-organism. In contrast fresh milk is a very inhospitable environment for growth and multiplication of the groups of pathogens enumerated above.

19. Pasteurization of industrial milk is almost always combined with an industrial process known as “homogenization”, which breaks the natural milk fat globules into much smaller droplets. Cow milk is a mixture of butterfat globules suspended in the aqueous fraction. The butterfat oil/fat droplets are less dense than water and tend, through varying force of gravity on bodies of different density, to rise to the surface of the milk. When milk that is not homogenized is left to stand, the fat globules rise and form a layer of cream.

20. Homogenization is a violent mechanical process in which the milk is exposed to high pressure as it is forced through a tiny orifice. In the process the natural membrane that surrounds and protects the fat are disrupted and the fats become broken into much smaller droplets. This results in an increase in the number of fat droplets with a decrease in their average diameter and an increase in the total surface area of the resulting fat globules. In a natural process, membranes reform around these smaller fat droplets. However, because of the increase in total surface area the original naturally protective membrane components formed in the glands of the udder are inadequate. Other proteins in the milk join to complete the covering over the fat droplets. The commercial result of homogenization is that the milk is more convenient to store, easier to control the quantity of fat, produces a uniform appearance, has a more stable self life, and enables the removal of cream as a by-product. From a health and nutritional perspective the result is fat covered by membranes that lack the nutritional and protective value designed into the natural milk globule as produced in the udder.

21. All human activity has risk. It is easy to voice the opinion that something is unacceptable unless it is "completely safe". However, nothing can be totally safe. From a scientific and risk analysis perspective the question becomes are the various risks acceptable? This must balance the value/benefits of the activity with the risks. In the present context we are focused on the general public and on food. Consumption of any food has some public risk. But consumption of food is not some interesting pastime, it is an absolute necessity. And consumption of high quality food is directly related to maintaining the public health and wellbeing. Families must consider food choice in the context of their personal health as well as maximizing the development of their children. Therefore acceptable risk when looking at the public health and consumption of milk must be balanced against the benefits to the public and our families. It is possible to make some calculations based on public statistics and the history of risks from consuming milk. Using myself as an adult male in the general public and the knowledge that I have been consistently drinking fresh unprocessed whole milk that for many years I have obtain directly from farmers that I know personally (I consume about 182 US gallons/689 L. per year); I have a greater risk of being injured in an automobile accident on the way to pick up my milk at the farm, then I do from drinking the milk every day.

22. Both industrial milk and fresh unprocessed whole milk being produced for human consumption have been associated with illness in the general public. These illnesses usually make consumers mildly but occasionally seriously ill. The possible risks are very small and do not rise to the level of a threat to the public health Particularly when weighted against the benefits.

23. In my professional opinion, fresh raw milk offers significantly greater health and nutritional benefits than industrial milk currently available in the public market. The comparative health advantage of raw milk consumption is most pronounced for the millions of people who have lactose intolerance, but the advantages are also significant for the many people who do not have this condition.

SWORN BEFORE ME this 4th day of)
January, 2011 in the State of)
Michigan, in the County of)
Washtenaw)
Deedra G. Devine)
A Notary Public in and for the State of)
Michigan)


Dr. THEODORE F. BEALS

This affidavit is notarized by:

DEEDRA G. DEVINE
Notary Public, Washtenaw County, Michigan
Acting in Washtenaw County, Michigan
My Commission Expires 10/12/2013