Focusing my testimony in support of Michael Schmidt in the Ontario Court of Justice, Newmarket

Good Morning. Dr. Hull and I will be presenting some items from our testimony over the last couple of days.

My first opinion for the court as an expert witness was that: Milk is inherently a highly nutritious and healthy food that should be an important component of the general public's diet. It is a complete food, and provides the total source of nutrition and water for newborn mammals during a critical and active time in their development. Milk has historically, and continues currently, to contribute to the Public Health and Safety.

I can not imagine that anyone wishes to argue against this statement. In the four inch thick bundle of expert witness documents submitted by the crown there is nothing that refutes this fact.

Throughout human evolution milk consumption has given people a competitive advantage.
Milk was nutritious, perhaps one of the most thoroughly nutritious foods people consumed. Milk was easily obtained, and the animals that were the source could be transported as people migrated. Scientists are unraveling the beneficial role of milk in immunity, our resistance to infectious diseases, and there will be many more benefits as scientist continue to look. One of the things scientists are now learning is that much of the competitive advantages of milk have to do with milk's natural microflora (communities of microorganisms including bacteria that become established in and on our individual bodies), including the organisms themselves, their activity and the products they produce. The more we look the more we understand about that relationship between people and their personal microflora, (in their intestine, on their skin, in their mouths, and many other locations) is extremely complex but vital to our health and resistance to infection. And because of the persistent use of milk in the diet of many of the peoples of the world, we and our associated microorganisms have developed some incredibly important and interdependent mechanisms for survival. This has happened because the consumption of milk conferred significant competitive advantages.

What happened? When people began to congregate in larger numbers in urban areas there was a need to change the way people obtained their milk. People had obtained milk from their own domestic animals. These animals produced lots of milk. It was consumed immediately and was converted into a variety of fermented products. But with urban development, and the popular belief that the **industrial model** allowed economies of scale and more efficiency, dairies shifted from a personal and farm-based model to reliance on large confined herds, with cheap feed, and a goal focused on the volume of product. It was a centralized model which required transportation over longer distances. There were extremely unacceptable consequences of this change in the dairy operations. People were refusing to drink milk because it spoiled.

Pasteurization, introduced for wine producers, was able to prolong the time before spoilage of milk. By extending shelf life these industrial dairy operations were able to get milk processed, and distributed to their customers. It is important to understand that although the proponents of pasteurization were extremely successful in marketing pasteurized milk for its safety; it was really about shelf-life and insuring that the product would not spoil before it was consumed in the home.

Ontario's laws prohibiting the sale of milk that has not been pasteurized were enacted in a highly political climate. This was a time when the public and the scientific communities had been participating for decades in vigorous debate on the facts, and the public interest surrounding what was commonly referred to as the "milk problem". It followed a time when the public was faced with the realities of widespread tuberculosis, typhoid, and diphtheria. The medical community was seeing many of their patients, frequently children, with diseases that were associated with the distribution of the new commercial milk. The debate was passionate, with innuendo and mis-information. One of the powerful tactics was to scare people with the fear of the newly discovered germs. Since their legislative success, the proponents of pasteurization have keep repeating their fear rhetoric over and over, again until it was become dogma. The controversy and the arguments against pasteurization were dismissed. They still signal the alarm bells; <u>the pathogens will kill you</u>, even

during the testimony in the court. The crown's witnesses make a convincing argument that the milk that has been studied in Ontario and the US should be pasteurized prior to consumption. They label this as raw milk. But as a health professional and risk manager I believe that the more relevant question is: **should the public be denied the right to obtain fresh clean unprocessed whole milk?** Milk in the natural traditional form used by civilizations all those years prior to the introduction of commercial/industrial dairying .

Much of the current information on the hazards of milk is dogma. Dogma suppresses doubt, and simple dogma becomes obsessed with suppressing doubt. One of my goals in Newmarket was to ask the court to doubt. The crown's witnesses repeatedly stated that there weren't many publications on the benefits of unprocessed milk, they just can't look back 50 years. They dismiss the European asthma study as tainted because there might have been some parents that were boiling their milk after buying it as unpasteurized. They acknowledge the damage to milk quality from pasteurization but brush that aside as not important in the big picture. One of the surprises was when the crown's lawyer asked us all if we agreed that there were very many papers on the hazards of milk, and hardly any on the benefits. Suggesting to the court that you determined which science is true by measuring the piles of paper for and against.

Ontario's two laws make an unqualified prohibition that you can not sell fresh natural milk. No matter what the original intent of that language, the truth is that nearly all of the rest of the world has not found it necessary to make such a blanket prohibition. As a healthcare professional I testified that this flat prohibition against fresh natural milk can not be justified on the basis of a need to protect the general health and wellbeing of the public. The numerous states in the US, and other countries that do not flatly prohibit the sale of fresh natural milk are not ignoring their constituent's health and wellbeing. They must be cognizant of their responsibilities; and simply acknowledge the historical and scientific fact that it is possible to provide to the general public milk that is highly nutritious, contributes to the health and wellbeing of their population, is fresh and can remain unprocessed!

It is obvious, but it needs to be repeated**: if milk had been hazardous to the individuals and communities that consumed it, the drinking of milk would have died out a very long time ago**.

One of the points I made was that it is not necessary to use procedures to kill bacteria in milk when it is consumed fresh by the general public; unless it is known that it contains bacteria that will cause illness in people and in adequate numbers to actually cause infection. The point does not need supporting documents or cited science because it is a principle of logic. If you justify the two sections of Ontario's laws on the basis that milk that has not been pasteurized is a threat to the public health because it causes illness**;** then if there are no disease-causing microorganisms in the milk or that they are present in insufficient numbers, that argument for pasteurization ceases to be relevant.

All kinds of ways to reduce the numbers of harmful bacteria have been tried but all cause "collateral damage" to the food. That is true of radiation of lettuce or pasteurization of almonds. **The tried and true means of minimizing risk of food spreading virulent organisms is to eliminate the source of the contamination**.

The two most obvious achievements in this regard in both Canada and the USA are the eradication of bovine tuberculosis and brucellosis. During the period (1890-1950s) when the intense public and medical debates about the "milk problem" were raging, the star examples used by the advocates for pasteurization were tuberculosis and brucellosis associated with the distribution of milk from the enlarging dairy industry. History however, documents that both these severe public health threats had already started to decline before pasteurization of milk was coming into use by the industry. These diseases continued to decline with the advancements of medical knowledge and public health efforts. But not because of pasteurization. During this period the most frequently legislated controls over milk production included dairy inspections, bacterial monitoring and the requirement that all dairy cows be tested for tuberculosis, and removed from milk production if reactive. The victory over these two threats was realized when cattle and dairy herds infected with these bacteria were totally eliminate by intense government test-and-kill programs. Despite the

elimination of the two most notorious diseases associated with milk by means other than pasteurization, the crown's witnesses keep repeating in numerous paragraphs and in their conclusions the assertion that pasteurization of milk is the only effective means of protecting consumers from pathogens.

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I am aware that you have probably heard that microorganisms present in fresh milk are **contaminants from manure**. Pasteurization supporters like to say this because it sounds really bad. Bacteria present in human breast milk have been studied extensively. There is no doubt that the microflora in breast milk from healthy mothers is critical to the development of the intestinal microflora of the suckling newborn. These bacteria play a critical role in the newborn's developing immune defenses and in the establishment of the necessary microflora of their intestine. But it is well documented that the microflora in breast milk from healthy mothers is similar to the mother's intestinal microflora. There is debate among a few, whether this is because of contamination of the milk from the mother's feces, is a natural colonization of the tissues of the nipple by beneficial bacteria, or, as some speculate, that the bacteria migrate from the intestine to the mammary gland. The source of these bacteria is not particularly important. You can call them contaminants, colonizers, or translocators. The point is they are present in the suckled milk and they are critical to the developing immune system and microflora of the intestine of the baby. We know that cow's milk contains many of the same bacterial types and unquestionably play the same role.

One line of argument, made by the crown's witnesses, is that large numbers of well designed studies of raw milk have demonstrate repeatedly that **bacteria commonly called pathogens are present in raw milk.** Both Dr. Griffiths and Dr. Wilson have personally participated in studies like this. I would add, that in the published reports of the studies of farm tank raw milk, the dairy's providing the samples were usually regulated and were presumably considered to be fully compliant with regulatory hygiene and bacteriologic standards.

As a pathologist I have found it extremely puzzling that in some of these studies, the researchers report that the farm families were drinking from the same milk tanks that tested positive for pathogens. And although less often mentioned in the reports, these families do not appear to be overwhelmed with illness. These families visit neighbors, attend church and community activities. Their children attend school. However, contrary to the picture painted by the crown's witness, the families did not carry disease into the community and infect all their contacts. If they had, we would be hearing about the massive public health threat of dairy families and there would be legislation to ban them from contact with the community.

For the last 5 years my wife and I have switched from drinking store bought milk, to consuming more than three gallons per week of what we in Michigan call "fresh unprocessed milk". My wife Peggy, who is a registered nurse, has written a widely used Consumer's Guide to Safe Handling of Fresh, Unprocessed Whole Milk.

I have devoted years to understanding the benefits and risks of this dairy product using the best science available. In the context of our extensive careers as healthcare professionals and a commitment to making food choices based on nutritional and health considerations, we currently drink only milk obtained fresh and unprocessed, directly from farmers that we know personally, from farms that we visit regularly, from cows on pasture, using hygienic milking procedures, and with routine on-farm testing. We appear healthy and we haven't noticed a trail of sickness as we move around our community.

The incidence of pathogens recovered from raw milk in North America varies. But one of the most extensive and widely cited reference concludes that 13% of farm tanks contain at least one pathogen. Dr. Griffiths testified that the percentages in Ontario farm tanks is much lower, but he used 13% in his affidavit. My personal experience includes viewing test results from hundreds of samples from dairies that are producing farm fresh, unprocessed milk intended specifically for direct human consumption; there have been no pathogens detected. Some of these dairies have only recently started submitting samples for pathogen testing, others have years of records.

Although I have not found anyone who has compiled and published this data there is another source of pathogen testing that is becoming available,. In the US there is considerable variation in the legal restrictions on providing milk for human consumption. For the most part this is what is referred to as a state's rights issue, meaning that the US federal government recognizes the right of individual states to pass their own laws concerning milk. Some of the states specifically allow production, distribution, or sale directly to consumers of milk that has not been pasteurized. And in a growing number of states that promulgate regulations of this unpasteurized milk, periodic sample testing for pathogens is being required. The milk in these situations is usually what I would call farm fresh, unprocessed milk. Although there have been rare instances in which regulators have reported finding "pathogens" in these samples, the number of such presumptive positive reports is much lower than in the published findings of tested raw milk (pre-pasteurized milk). This supports my observation that the microbiology and very likely the pathogen content of pre-pasteurized milk and farm fresh, unprocessed milk is distinctly different. And the public health implications of this observation are obvious. I can add that my review of the public reports has shown that in none of the rare instances where a state agency has reported finding something they are calling a pathogen, none of the many consumers of that specific milk had any illness.

In those dairies using the cowshare model the consumers of this farm fresh unprocessed milk are extremely well identified because for the most part they obtain their milk through signed contracts with the dairy and families obtain milk on specific days, providing a perfect tracking system.

Some comments on pasteurization?

Pasteurization is not the application of heat to destroy human pathogens in milk. It is the physical heating of milk primarily to reduce the number of bacteria that might be present in the milk. The commercial incentive for this treatment to reduce the number of bacteria, is to increase the time before the milk spoils and becomes unmarketable. In other words to increase the shelf life.

Nothing selectively kills only the bacteria that cause illness in humans, because this group of rare bacteria have no distinctive vulnerabilities that can be singled out to specifically target them while not disturbing the vast community of bacteria that do not cause illness in humans. With pasteurization there is well documented collateral damage to beneficial bacteria and other components of milk.

It is an historical fact that the use of commercial pasteurization was often hidden from the public by those early industrialized dairy plants because the heating of milk was generally held to be bad for milk and changed the taste. The widely acknowledged reason that it was used is that it was the most practical way to keep the commercial product from spoiling before it reached the consumer. All of the currently acceptable forms of pasteurization are still considered by the industry as the most practical way to prolong shelf life even further than in those early days. The significant difference between the current types of pasteurization in not safety, it is how long the shelf life is extended. Making milk healthier was not then, and it is not now, the principal industrial value of pasteurization.

What really astounds me is that since the wide spread use of pasteurization, many highly **lucrative businesses** have arisen for the purpose of ADDING back things removed or damaged by pasteurization. Probiotics are in great demand by a growing health-conscious public. These business know what pasteurization does to milk.

The Canada Communicable Disease Report published in May 2008 states that there are approximately 11 million episodes of foodborne disease each year in Canada. http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/08vol34/dr-rm3405b-eng.php The UA Center for Disease Control estimates that 76 million cases of food-borne disease occur each year in the United States.
http://www.cdc.gov/ncidod/dbmd/diseaseinfo/foodborneinfections_g.htm#howmanycases
In the court case the crown's witnesses listed the incidents and cases of pasteurized and unpasteurized milk reported in North America for a span of 8 years. They included many examples that we know are not actually

linked with certainty, but for the moment let's use their numbers. So they say that the total illnesses with some link to consumption of raw milk is 232, averaging 30 illnesses per year. That would be out of an estimated **87 million** foodborne illnesses in the two countries. The most recent outbreak of salmonella linked to peanut butter product in the US and now appearing in Canada has made more than 500 people ill and 8 possibly linked deaths, and additional cases reported daily.

I am personally unaware of any evidence that the milk from the farm in this trial has ever contained any pathogenic organisms capable of causing illness in a consumer. And am unaware of any illness in the many consumers who have been drinking this milk for years. I can specifically say this because unlike the general retail sale of milk which goes out to an obscure and undefined population, the milk from this farm goes to a specific set of consumer families. They know who has been drinking this milk. The fact that most farm fresh unprocessed milk goes out to a highly defined consumer population, makes the risk assessment of this product unimaginatively easier to study and monitor.

One of the strong arguments in the Newmarket case is that Ontario is an outlier by having a law that totally prohibits any milk that is not pasteurized. Many developed counties allow, what the defendants call a "hazardous" food. And interestingly there are no statistics that indicate in those countries that there is a severe public health crisis. Children are not dying, as some in Ontario's agencies have warned. In fact in some countries, in their program to encourage good food in schools, there are milk dispensaries in the school, some with choice for either pasteurized or unpasteurized milk.

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There were several key topics that I brought before the court in addition to our positions on the number of benefits of consuming unpasteurized milk, and the damages that pasteurization causes in milk.

- In the USA and Ontario there is a vigorous, coordinated campaign to stamp out the growing number of diaries that are providing fresh unprocessed milk directly to consumers. I will leave to others to talk about the motives for this campaign.

- The principle public and legislative argument they use at this time is that milk that has not been pasteurized is hazardous to the public. Again I will leave it to others to talk about the variations of this argument, like killing babies, etc.

- Finally, the principle basis for the claim that this milk is dangerous is that repeatedly, and consistently raw milk samples are found to contain pathogens.

I want to spend some time this morning talking about two general topics that I presented to the Newmarket Court to counter this aggressive campaign to stamp out small farms that offer choice to those who want a higher quality milk.

#1. Milk is Milk. We have all heard this and I presented a line of evidence that said that this public relations punch-line is flawed. I start my line of argument with some observations. When I talk with dairy farmers providing farm fresh unprocessed milk across the countries, I ask about testing of their milk. Increasing numbers are saying that they have been testing for pathogens and they are NOT getting back positive results.

As a scientist, particularly one who has spent his life testing specimens, the difference between the published data on pathogens in raw milk and my observation of the test results at the dairies that I know, are real differences. In my opinion the sampling appears to be the same, the test equipment is very similar, and the labs are really similar. So it narrows down to the samples themselves (that is the milk).

I question whether the product tested in the numerous published studies describing samples from raw milk, is the same product from the dairies that I have been observing. I do not know what the precise differences are, but if you look, there is an obvious characteristic that distinguishes the two products. The "raw milk" was produced in dairies that are licensed to provide milk for pasteurizing plants, and are specifically banned from providing that product directly to human consumers. To aid in the discussion and before the court I am calling this **pre-pasteurized milk.**

And the milk from the contrasting dairies (the ones that I observe do NOT have positive pathogen test results) is intended for immediate human consumption. To be precise it is milk that is produced specifically to be consumed fresh and unprocessed. I am referring to this as **farm fresh unprocessed milk.**

Interestingly, the judge in the Schmidt case was also curious about this apparent conflict of science when it was presented in our testimony.

The second topic concerns the nature of pathogens.

A casual reading of the affidavits from the two expert witnesses appearing for the crown, leave the impression that **bacteria and pathogens are sort of the same.** Because of this sloppy terminology I presented to the court, and to you, a brief discussion about pathogens.

In the context of the court I focused on **bacteria** that cause illness in the general human population, setting aside the other forms of microorganisms. As I always pointed out to medical students it is fortunate in preparing for examinations that the list is actually reasonably short. Whereas, the list of all bacteria that do not cause illness in humans, some of them in fact beneficial some even essential for our well being, is huge. And even more interesting, the vast numbers of bacteria that have not even been characterized and given names is far greater than the numbers that have been named.

As health researchers examined people with illness, they have learned that some of named bacteria can be grown from material of ill persons (e.g. their stool, wound, or blood). Using strict criteria, it can be shown among the group of infectious diseases that certain bacteria can be isolated from and can specifically cause the different recognizable infections. In some cases the bacteria that are found, have not previously been given names, so the researchers establish scientifically recognized characteristics and give them names. **These bacteria that can cause infections are commonly called pathogens.**

The difficulty is that in nearly all cases the characteristics that have been used to distinguish the different named bacteria have nothing to do with their ability to cause illness in people. The characteristics used in naming include nutrients or environmental conditions needed for the growth of the different bacteria, and what chemical products are produced by the different bacteria when they are active.

Naming of bacteria is conventionally done with a two-part name (genus and species). Examples would be *Listeria monocytogenes* (in which listeria is the genus, and monocytogenes is the species). The design is so the two-name designation would be adequate to allow microbiologists to be sure that they were talking about the same thing. The naming is not chiseled in granite, there is a constant acquisition of new information, and things that first looked to be distinctive are found to be different, and some bacteria thought to be related are found to be quite different. Unfortunately the naming is constantly in a state of flux. But far more important for this court, is that the designation as a pathogen is not a synonym for the two-name distinction.

An analogy may help.
It is possible to define a group of people as Scandinavians, and that there could be a set of carefully determined distinguishing characteristics that would enable you to reliably determine if someone on earth belonged to that group. Over time people are murdered and someone notices that in some of those cases the person proven to be the murderer had the distinguishing characteristics of a Scandinavian. No logical person

would conclude that all Scandinavians are murders. Furthermore it doesn't follow that the Scandinavian person who committed a specific proven murder would go around murdering everyone they encountered. The naming of bacteria and the behavior as pathogens are like this.

For example experts have come up with a science based classification that identifies *Listeria monocytogenes*. Their characteristics are well documented and they are given the standard two-part name. We can examine numerous samples from people becoming sick, and sometimes we isolate bacteria that have the characteristics of *Listeria monocytogenes*. But it does not follow that all *Listeria monocytogenes* are going to make people sick. Or even that the identical isolate of *Listeria monocytogenes* that caused sickness in someone, would cause sickness in everyone that was exposed to that specific *Listeria monocytogenes*. The problem arises because the characteristics that are used to classify/give two-part names are for the most part based on compounds and conditions that are favorable for the growth of the specific bacterium. And it is extremely rare that these characteristics are associated with the behavior that enables them to infect people and cause disease.

Furthermore, scientists studying infectious diseases have repeatedly found that within any specific two-named bacterium, for example *Listeria monocytogenes,* there are large numbers of different subtypes. And not surprisingly, other scientists using other tools to examine these bacteria (all accurately named as *Listeria monocytogenes*) find even additional subtypes. International committees meet regularly to try to make systematic sense of the constantly expanding number of subtypes. I am using the specific genus and species, *Listeria monocytogenes*, as an example, but the same is true for all named bacteria, and for the purposes of the trial, all of the recognized "pathogens" have subtypes. Databases of the expanding list of subtypes of the two-named bacteria commonly labeled as pathogens are recognizing include those that have been isolated from people with illness, as well as those that have no association with human illness. So not all subtypes of named bacteria that have been commonly called pathogens, are actually capable of causing illness.

An example may help. The bacteria with the two-name abbreviated, *E. coli*, is almost everywhere in our environment. They are extremely important in our digestive system. A very few subtypes of *E. coli*, one in particular labeled as *E. coli* O157:H7, has been isolated from people with diarrhea. The terminology is parsed out as number 157 in the listing of the O subtypes, and 7 in the listing of the H subtype. Most of the public has heard about this sub-subtype of *E. coli*. If it becomes established in the colon it can cause severe diarrhea and should be designated as a virulent form of *E. coli*. But in a sloppy and totally incorrect use of the term *pathogen*, people often simply say: *E. coli* is a pathogen. The crown's witnesses have used this sloppy term. When we start blaming groups of bacteria for human illness, it is essential that we be precise.

Truly virulent subtypes of bacteria are not everywhere, they are fortunately, extremely rare. The crown's witness present numerous references and point out in their affidavits that pathogens are everywhere, specifically in all milk. This is sloppy terminology. And they compound this sloppy terminology when reaching the unwarranted conclusion that, people consuming milk will become sick, unless the processes of pasteurization kills all those deadly pathogens. Flawed logic because, not all milk contains pathogens. Not all bacterial labeled as pathogens are going to cause people to become sick. And finally flawed because pasteurization does not guarantee that milk will not cause illness. Their affidavits document many incidents of foodborne illness resulting from the consumption of pasteurized milk. The most recent example in the USA caused three deaths and a woman to miscarriage. Linked to consuming pasteurized milk.

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Risk management

Every time you increased the complexity of a processing system, (the number of transfers, the number of people who come in contact with the milk, etc.) you are increasing the number of critical control points that need to be addressed in any milk safety plan. As a risk manager I appreciate that in the model I know for providing farm fresh unprocessed milk directly to consumers, there are incredibly fewer risk points when contrasted with the current industrialized dairy operations.

Industrialized dairies are characterized by larger dairy herds, which are confined indoors with complex milk collection and storage, and have larger volumes of milk collected at each farm. Pooling of milk from different farms is a common practice. Transportation over long distances, complexity of the processing, pressure to shorten the time it takes to pasteurize and demands of a large complex distribution system are only some of the additional critical control points that significantly increase the potential public health impact of failure of control measures.

I am daily bombarded with reports of new foodborne illness incidents in North America. The epidemiological challenges facing the officials charged with tracking down the sources, and identifying the distribution range of the contaminations is overwhelming. The public is rapidly becoming alarmed at the apparent inability of the professionals to do any about it.

When I, as a professional risk manager became focused on the supply of farm fresh unprocessed milk, I realized that this dairy management model was a public health dream!
The dairy operations that provide the most common model for providing farm fresh unprocessed milk not only avoid most of the critical points in the industrial model, but incorporate some very significant public health advantages to those of us that focus on risk management. In the cowshare operations milk characteristically comes from small herds, owned and managed by single families. Milk is not comingled from different farms. Milk collection and distribution to consumers is measured in hours not weeks and the consumer population is well defined. In most operations both the consumer and the farmer know exactly which milkings and day the milk was obtained. The total number of consumers who obtain specific "batches" of milk is small. The consumers are motivated to use in-house techniques to maintain quality.

Dr. Wilson states that **pathogens are natural components of milk**, and goes on for paragraph after paragraph listing groups of bacteria with the statement that they are ubiquitous, that they cause disease, and that disease can be fatal. With these broad brush strokes he makes a case that these bad actors are so common and such a serious threat that they must all be killed (by pasteurization) to protect the public. I will not take the time to point out each instance where this sloppy use of the term pathogen is used to show widespread disease and death. I simply point out that in the large portions of the developed world where the product is not banned, large numbers of people are <u>not</u> becoming infected, having horrific long term consequences and dying from drinking farm fresh unprocessed milk. These countries <u>do not</u> have a public health, foodborne infectious illness crisis; at least not from milk.

There is out a consistent pattern of flawed logic in the Affidavits of the crown's expert witnesses.

In his affidavit Dr. Griffiths repeatedly applies a <u>double standard</u> when making his points. He acknowledges that the milk, I am calling pre-pasteurized milk, contains pathogens and is the vehicle for foodborne illness. Acknowledges, but then simply dismisses as not significant. Then repeatedly makes conclusions on the hazards of what I call farm fresh unprocessed milk, demanding the need for an <u>absolute guarantee</u> of safety.

He and Dr. Wilson repeatedly describe raw milk as hazardous and capable of causing severe and long term consequences, and warn that consumers of this hazardous food can spread illness through the community. But then admit that pasteurized milk has been documented to have caused illness in people, and that the same dreaded consequences hold true whether the milk was unpasteurized or pasteurized. They do not explain why pasteurized milk is not banned, but insist that farm fresh unprocessed milk must be totally banned.

Two final topics about the benefits of milk that is farm fresh and unprocessed.

Lactose intolerance.

I and many others have been hearing about people who have a condition known in the medical profession as lactose intolerance. What we were hearing was that some of the people who avoid any dairy products because it causes severe abdominal cramps and diarrhea, found that fresh unprocessed milk did not have this effect.

In a large, scientifically designed questionnaire for cowshare participant families in Michigan we added a section focused on lactose intolerance. Of more than two thousand members of households that completed the questionnaires, 155 (6%) had been told by a health professional that they had lactose intolerance. [This percentage closely matched the responses from an independent, randomly controlled nationwide household survey.] Of the 155, 127 (82%) did not have their symptoms of lactose intolerance when drinking fresh unprocessed milk, and nearly all of them were drinking this milk regularly. This is solid evidence that the symptoms of this very common condition are not present in a large percentage of people if they switch to unprocessed fresh milk. An explanation for this fact will need careful scientific analysis and research. However, I agree with Dr. Griffiths that this is not evidence that raw milk cures this disorder. In fact that same survey established that when many of the people who did not have symptoms when they drank fresh unprocessed milk, had a return of the dreadful symptoms if they tried commercial milk again. For the large number of people who have discovered that when drinking fresh unprocessed they do not get their symptoms, what is important is that they find that they can return to drinking healthy and tasty milk.

Asthma

Dr. Griffiths dismisses the solid findings published in a series of papers from Europe and England that have established that children who drink farm milk that has not been pasteurized have a significant reduction in asthma and some allergies. The conclusions are scientifically solid, based on analysis of several large controlled studies involving more than 15,000 children. The most recent of these publications addressed the specific question of whether the protection was specifically associated with the consumption of unpasteurized milk or might be the result of exposure to a farm environment, and concluded that it was <u>not</u> an effect of farm exposure [Clinical and Experimental Allergy, 37:661, 2006. Waser et al.] Another solid finding of this study is that if a child had drunk farm milk in their infancy, it not only reduced asthma, it protected against it and other allergic reactions as the child grew older. The effect is fact. Future research will be needed to explain this protective effect of farm fresh unprocessed milk. Unlike Dr. Griffiths who dismisses the findings because they lack an explanation, as a scientist I know that observation is the first step that should lead to additional research. But not understanding the cause does not negate the facts.

There is a growing group of consumers that appreciate the quality of farm fresh unprocessed milk and are seeking out this product because they are convinced that it has many nutritional and health benefits. They want to know where their food is coming from, and specifically know how the farmer makes management choices in providing their food. These consumers are willing to travel long distances to obtain this special product, and pay a significant premium for what they see as enhanced quality. Furthermore, they are well aware that the product is not sterile. They know that many bacteria grow in milk under certain conditions. They know that farm fresh unprocessed milk contains <u>beneficial</u> bacteria that enhance their intestinal flora, digestion, and their immune system. They take particular care of this milk to retain its quality until it is consumed. They are knowledgeable and speak out strongly that they would like to be able to make their own food choices based on their weighing of benefits and risks.

As a healthcare professional I applaud **these informed consumers**. They realize that food is not just something that should be from the cheapest and most convenient source then dash through their meals so they can get on to more important things. They appreciate that food is critical to healthy active lives, that the quality of their food choices have short and long term consequences for themselves and their families. They want their food from local producers. They want to adequately compensate farmers for producing quality food. They do not trust the motives behind the commercial marketing, the push to have all our food thoroughly processed so that it can be provided in the most efficient and cheapest way possible. And they see that government's intrusion into their personal food choices as being overly influenced by the industrialized food giants.

As a professional risk manager I am puzzled that farm fresh **unprocessed milk has been singled out** for such an intense focused campaign when scientific logic and analysis of outbreaks, rank many other foods as being implicated in far more incidents of foodborne illness. Why are these common foods not banned in Ontario. I have given the court my professional opinions as a risk manager and diagnostician, and viewed from my

personal perspective as a consumer. I have given solid reasons to doubt, not the science, but the interpretations and conclusions of the crown's witnesses. It is not because they are not sincere, nor unknowledgeable, but because of their lack of exposure to farm fresh unprocessed milk and the dairies that provide it.

In summary:

The question before the court is quite simple: **should the general public be prevented by law from having access to fresh clean unprocessed whole milk** ? Or perhaps, is the law justified in making a distinction between access to milk that has been pasteurized and access to farm fresh unprocessed milk. In describing the public health threat from what they call raw milk, the crown's witnesses use page after page of documentation that raw milk has been shown to be hazardous and must be banned outright. The principle flaw in this picture is that, although what they say may be true for pre-pasteurized milk, they have not shown that it is true for farm fresh unprocessed milk. The reason that they have not shown this, is because their experience and nearly all of the published science has been examining pre-pasteurized milk.

It is my professional opinion based on my education and experience that:

1. milk does not naturally contain pathogens;
2. simply because a bacteria is categorized as belonging to a group labeled as a pathogen, does not mean that that specific bacteria will cause members of the public to become sick;
3. pasteurization does not guarantee that market milk will not cause disease; and
4. the use of the term "raw milk" hides a critical distinction between pre-pasteurized milk and farm fresh unprocessed milk.

Final comments on recommendations to the court

I offered a professional suggestion that the way forward to enabling informed consumers who want to obtain farm fresh unprocessed milk from dairies that are managed to provide this quality product, would be to gather representatives of the various positions in this contentious debate and charge them with coming up with a workable solution. Dr. Ron Hull agreed with this way forward. Both Dr. Hull and I have personal experience with this approach and agree that it has proven useful in other localities. The ever growing number of informed consumers demanding farm fresh unprocessed milk are not going to go away. They will not be satisfied with the status quo. This healthy and nutritious product is available in many locations in the world. There are workable solutions, but the current aggressive stance and rhetoric can only inflame the various sides.

Thank you Dr. Ted F. Beals