

# Canada's 'Other' Illegal White Substance: Evidence, Economics and Raw Milk Policy

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## Introduction

Prevention of milk-borne illness has been of Canadian public health concern since the early twentieth century,<sup>1</sup> when 'raw' (unheated) milk was implicated in the transmission of various illnesses, including tuberculosis.<sup>2</sup> Since that time, pasteurization – the heat treatment of milk to significantly reduce the viability of pathogens<sup>3</sup> – has become a global standard in industrial milk production.<sup>4</sup> In 1990, Canada imposed a federal prohibition on the sale of unpasteurized milk under the *Food and Drug Regulations* (Section B.08.002.2), which reads:

"[N]o person shall sell the normal lacteal secretion obtained from the mammary gland of the cow, genus *Bos*, or of any other animal, or sell a dairy product made with any such secretion, unless the secretion or dairy product has been pasteurized."<sup>5</sup>

This ban, introduced by Health Canada, was intended to "provide a regulatory safeguard against milk-borne illness by implementing a uniform control measure across Canada",<sup>6</sup> and was implemented after federal efforts to encourage provinces to prohibit raw milk sales were 'met with limited success'.<sup>7</sup> Since 1990, all provinces and territories have come into compliance with the federal prohibition through a variety of

regulatory measures which enable the ban to be locally enforced.

Provincial courts in Ontario<sup>8</sup> and British Columbia (B.C.)<sup>9</sup> have convicted farmers for distributing raw milk for human consumption; yet, an underground raw milk supply continues<sup>10</sup> despite both provincial<sup>11</sup> and federal<sup>12</sup> public health campaigns cautioning against this food's consumption. A burgeoning movement of both consumer organizations such as the Canadian Consumer Raw Milk Advocacy Group<sup>13</sup> and Slow Food Canada,<sup>14</sup> as well as farmer organizations such as the National Farmer's Union,<sup>15</sup> have begun to lobby for legal raw milk access in Canada; and the issue is gaining traction both in political and scientific circles. In what follows, I analyse Canada's current raw milk policy using Health Canada's three-pronged decision-making framework (involving issue identification, risk assessment, and risk management);<sup>16</sup> and conclude that prohibition is a disproportionate regulatory approach given the existing scientific evidence of the potential risks and the regulatory approach taken with other products harbouring similar associated risks. Federal and/or provincial policy reforms discussed in this work would enable those Canadians who continue to consume raw farm milk to do so more safely, while maintaining pasteurization as the nationwide standard for safe, industrially-produced milk.



## Issue Identification

The first component of Health Canada's decision-making framework - issue identification - aims to provide context for risk-related policy discussions, by broadly exploring various facets of the regulatory question at hand, including socio-economic and political issues.<sup>17</sup> With respect to raw milk, these include, below, an overview of existing regulatory frameworks and their associated enforcement mechanisms; the scale and scope of raw milk consumption in Canada; levels of support for regulatory change; and economic factors at play in the relevant industries.

*Regulatory frameworks.* Amongst industrialized nations, Canada is unusual but not unique in its nationwide prohibition on raw milk sales: Australia has similar policies.<sup>18</sup> However, many nations - in particular across the European Union - allow the legal sale of raw milk under tightly regulated systems.<sup>19</sup> Raw milk sales are variously permitted across Europe at the farm gate, in retail stores, and in vending machines.<sup>20</sup> About half of U.S. states allow raw milk sales in some form.<sup>21</sup> In recent years, some U.S. states - including Colorado,<sup>22</sup> Michigan,<sup>23</sup> Ohio,<sup>24</sup> North Dakota<sup>25</sup> and Washington<sup>26</sup> - have explicitly legalized private raw milk 'herdshare' arrangements, in which members procure raw milk from farmers caring for co-owned herds.

Although Canada's ban on raw milk sales is found in federal legislation, it has not, to date, been enforced through federal mechanisms. Instead, enforcement has taken place at the provincial level, as illustrated in the high-profile Ontario<sup>27</sup> and B.C. cases.<sup>28</sup> Each province and territory supports the federal ban through a set of distinct public health and dairying regulations that enable local enforcement of the federal ban. B.C., for instance, prohibits the distribution of raw milk except when it is being transported to a pasteurization plant.<sup>29</sup> B.C. furthermore designates raw milk as a health hazard under the province's Health Hazards Regulation (pursuant to the B.C. *Public Health Act*);<sup>30</sup> notably, no other food for human consumption has been so designated in the province. Regional health authorities have undertaken to enforce the raw milk ban in B.C. In Ontario, a similar regulatory effect is produced by stipulations in both the province's *Milk Act*<sup>31</sup> and *Health Protection and Promotion Act*,<sup>32</sup> the latter Act has been cited in enforcement efforts, which have been implemented by the Ministry of Natural Resources.<sup>33</sup> What is notable about such provincial regulations, beyond their utility

for enforcing the federal raw milk sales ban, is that they extend this ban to further prohibit 'distribution' of raw milk. In other words, it becomes illegal in several Canadian jurisdictions even to give raw milk away to a neighbour.

*Raw milk consumption and advocacy.* It is clear that a minority of Canadians prefer to consume milk raw. Public Health Ontario found 2% of Ontario residents to be consuming raw milk,<sup>34</sup> similar to 3% of U.S. residents surveyed.<sup>35</sup> Taste,<sup>36</sup> a preference for unprocessed food,<sup>37</sup> and unique

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health benefits<sup>38</sup> are commonly cited rationale for raw milk consumption. Amongst Canadian dairy farmers, who have ready access to raw milk, consumption rates are significantly higher at 88%.<sup>39</sup> Because consumption of raw milk is entirely legal, Canadian farmers who own dairying animals may freely consume the product as long as they do not sell it to others. However, those who do not own their own cows, goats or sheep do not have a legal means, within Canada, of procuring raw milk. It is this discrepancy between farmers and non-farmers which has given rise to the practice of 'herdsharing', in which a farmer sells shares in a dairying herd to those who wish to gain access to raw milk. Shareholders typically pay a regular maintenance fee to the farmer, who cares for their animals and bottles their milk.<sup>40</sup>

Herdsharing - which is explicitly legal in a number of U.S. states - does not involve the sale of raw milk, and arguably the practice does not contravene the federal prohibition on raw milk sales. However, court rulings in both Ontario (*R v Schmidt*)<sup>41</sup> and B.C. (*Fraser Health v Jongerden*)<sup>42</sup> have to date rejected these arrangements' legitimacy as a means of accessing raw milk, despite an initial acquittal in the case of *R v Schmidt*. In the subsequent appeal, the Crown rejected Schmidt's specific herdsharing scheme but acknowledged that 'a valid transfer of ownership or the conferring of an

equity interest in the cows or in the herd or the milk they produce<sup>43</sup> may enable non-farming herdshare co-owners to legally access their own raw milk in the province of Ontario. Although no official data exist to document the extent of herdsharing in Canada, recent estimates suggest that twenty or more ‘farmer to consumer raw milk supply chains’ may be operating in B.C., and at least that many in Ontario.<sup>44</sup>

Several organizations, including Slow Food Canada,<sup>45</sup> the Canadian Raw Milk Consumer Advocacy Group,<sup>46</sup> and the National Farmers Union,<sup>47</sup> continue to lobby for legalized access to raw milk in effort to bring the product out of its existing underground market. Raw milk advocates have garnered some degree of support from provincial politicians in recent years, with an Ontario private members’ bill to investigate the issues being brought forward (but defeated) in 2006;<sup>48</sup> and B.C.’s opposition New Democratic Party caucus conveying support for the provincial legalization of raw milk herdshares in 2011.<sup>49</sup> In 2014, the University of Guelph (Ontario) hosted a Science-to-Policy academic symposium focused on exploring the raw milk question; despite a predominant view shared by those presenting at the event that the current underground market conditions were contrary to the spirit of public health protection, the issue remains politically unresolved in Canada.<sup>50</sup>

### Political and economic factors

Despite the predominantly scientific framing of the raw milk issue by Health Canada and provincial public health bodies, as well as by industry, the prohibition on the sale of raw milk undoubtedly has economic and political dimensions. Indeed, it cannot be ignored that the federal government’s impulse to implement a raw milk sales ban was strongly supported by the Dairy Farmers of Canada (DFC), the nation’s federation of milk producers.<sup>51</sup> As Charlebois, a Canadian economist, has pointed out:

“Dairy farmers, arguably Canadian agriculture’s most powerful lobby group, perceive any change to the current legislative regime as an economic threat. Even if raw milk would likely appeal to a marginal number of consumers, dairy farmers consider this as a legitimate menace, however small.”<sup>52</sup>

Dairy producers’ particular objections to permitting the sale of raw milk are likely twofold. On one hand, the

prospect of legalizing raw milk sales in Canada represents a further diversification of products which might require reforms to the existing supply management marketing oligopoly.<sup>53</sup> Indeed, previous recommendations that Canada’s supply management regime be reformed<sup>54</sup> have been met with strong opposition by industry stakeholders such as DFC, intent on maintaining income stability and market control within the existing regime.<sup>55</sup> Furthermore, the prospect of introducing raw milk – clearly a higher risk food than pasteurized milk – <sup>56</sup> into the marketplace may be seen as potentially jeopardizing ‘the image of an entire industry which has built its reputation on the safety and wholesomeness of its products’.<sup>57</sup> However, the literature suggests that a subpopulation of Canadian dairy farmers – who appear to support supply management – also favour legalization of raw milk sales.<sup>58</sup>

In a 2010 survey, Young and colleagues found that 36% of Canadian dairy producers – particularly organic farmers, producers under age 30, and those with smaller dairy herds - express support for legal access to raw milk.<sup>59</sup> Economically, this appears significant given the increased consumption of ‘healthier’ and organic milk and dairy products in Canada, particularly amongst younger demographics, juxtaposed with a reduction in overall pasteurized milk consumption.<sup>60</sup> However, anti-prohibition producers do not appear to uniformly favour major reforms (or even abolishment of) supply management in order to permit a greater diversification of the fluid milk marketplace. Rather, some favour minor, product-specific reforms which leave the overall regime intact, as demonstrated by a 2013 National Farmers Union report which recommends exclusive regulation of small-scale raw milk producers within the supply management model.<sup>61</sup>

Notably, smaller-scale producers, who are more likely to favour legal raw milk sales,<sup>62</sup> are those who may be benefiting most from supply management in that their incomes are protected despite relatively lower productivity as compared with larger operations.<sup>63</sup> Proponents of major supply management reforms (and even its abolition) tend to emphasize production of high yields from larger herds with cows (such as Holsteins) producing lower-fat, lower-protein milk. They characterize smaller-scale producers as less efficient farmers who unnecessarily drive up Canadian milk prices.<sup>64</sup> However, those raw milk consumers who can afford to do so appear willing to pay higher prices.



These consumers emphasize quality over quantity,<sup>65</sup> demanding richer milk from lower-yielding cow breeds<sup>66</sup> (such as Jersey and Canadienne varieties). All of the aforementioned economic and political nuances certainly play into the complexity of the raw milk policy conundrum in the Canadian context. However, it is a scientific discourse around raw milk's potential risk of causing foodborne illness which dominates public discussion, and which therefore warrants closer attention at this point.

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## Risk Assessment

Historically, raw milk has been associated with the transmission of such severe (and sometimes fatal) human disease as tuberculosis, as well as brucellosis.<sup>67</sup> Pasteurization – a heat treatment which significantly reduces viability of many milkborne pathogens – was introduced as a preventive measure in many jurisdictions worldwide through the early twentieth century,<sup>68</sup> and has been lauded as a major public health triumph in its ability to prevent such severe milkborne disease.<sup>69</sup> However, as a result of both pasteurization and other major technological and hygienic advances in dairying over the last century (such as refrigeration, animal testing and milk testing),<sup>70</sup> tuberculosis has been largely eradicated from dairying herds in Canada and other industrial nations.<sup>71</sup> As such, this disease is no longer of significant concern for raw milk in the Canadian context. However, other milkborne pathogens have taken its place.

A considerable body of literature exists reviewing the isolation of various human pathogenic bacteria from raw milk samples. These include varieties of *Campylobacter*,<sup>72</sup> Shiga toxin producing strains of *E.*

*coli* (STEC),<sup>73</sup> *Listeria monocytogenes*, various *Salmonella* species,<sup>74</sup> *Staphylococcus aureus*, and *Cryptosporidium parvum*<sup>75</sup>. Although the potential for raw milk to contain pathogenic bacteria is frequently cited by public health bodies (including Health Canada,<sup>76</sup> BC Centre for Disease Control,<sup>77</sup> and Public Health Ontario<sup>78</sup>) as a direct rationale for prohibition, it is clear that a rigorous policy-related assessment of foodborne risk for any food should consider various questions beyond pathogen prevalence alone, such as dose-response, consumers' immunological status, storage and transport conditions, potential benefits of consumption, as well as possible risk mitigation strategies.

The literature around raw milk's risk profile has elsewhere been reviewed by government bodies,<sup>79</sup> as well as by scholars including Claeys *et al.*,<sup>80</sup> Baars,<sup>81</sup> and myself<sup>82</sup>. Two types of studies are of primary importance in this regard. The first involves work reviewing patterns within the epidemiological outbreak literature involving actual cases of illness. The second involves quantitative microbial risk assessment (QMRA) studies, complex mathematical models which – as the international evidentiary gold standard for assessing foodborne risk<sup>83</sup> – incorporate multiple factors from farm to table in establishing the probability of illness (and severe health outcomes) from a particular foodborne pathogen. What follows is a brief summary of raw milk's risk profile as evidenced in these two bodies of scientific literature.

Three primary pathogens appear of current significance in relation to raw milkborne illness in the U.S.,<sup>84</sup> Europe<sup>85</sup> and Canada<sup>86</sup>: *Campylobacter*, STEC and *Salmonella*. Each of these pathogens (listed in order of frequency of causation) has been repeatedly implicated with foodborne outbreaks involving both adults and children, in some cases producing severe health outcomes. However, over the last forty years, no deaths associated with raw fluid milk in industrialized nations have been confirmed.<sup>87</sup> This is notable given that a significant proportion of Canadian,<sup>88</sup> American,<sup>89</sup> and European<sup>90</sup> dairy farmers – and a minority of other consumers in both Canada<sup>91</sup> and the U.S.<sup>92</sup> – are reported to be regular raw milk consumers. <sup>(i)</sup> A small number of illness cases have been reported to be associated with *Cryptosporidium*

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- i The risk of illness and death from consuming raw fluid milk should be clearly distinguished from that associated with various unpasteurized cheeses, which harbour distinct microbial profiles.



*parvum* contamination in raw milk,<sup>93</sup> but the literature on this subject is scant. As confirmed in QMRA studies, neither *Listeria monocytogenes*<sup>94</sup> nor *Staphylococcus aureus*<sup>95</sup> appear of epidemiological significance in relation to raw milk<sup>96</sup> despite being not infrequently isolated from raw milk samples.<sup>97</sup>

*Campylobacter*, STEC, *Salmonella* and *Cryptosporidium* share the characteristic of most frequently producing self-limiting, gastrointestinal disease; however, at times, each may produce more severe, long-term disease.<sup>98</sup> Typical hospitalizations rates (across all foods) for each of these pathogens range from 17% for *Campylobacter*, to 25% for *Cryptosporidium*, 27% for non-typhoidal varieties of *Salmonella*, and range from 13 – 46% for different STEC varieties.<sup>99</sup> Death rates associated with illness from each of the named pathogens are lower than 0.5% in all cases.<sup>100</sup> Of the four pathogens of concern, it is STEC which poses the greatest threat of severe outcomes such as hemolytic uremic syndrome (HUS), a life-threatening condition. Young children below age 5 are most at risk for contracting HUS from foodborne STEC and a handful of raw milk associated cases have been reported in both North America<sup>101</sup> and Europe.<sup>102</sup>

There is no question that there is a distinct risk of foodborne illness, severe health outcomes and even death from raw milk consumption. However, as reported elsewhere,<sup>103</sup> risk probabilities calculated in recent quantitative microbial risk assessment studies (QMRAs) suggest that raw milk's risk profile appears in fact notably lower than that associated with other common foods harbouring similar pathogens. For example, per-consumer risk estimates in a 2012 Italian QMRA for raw milkborne campylobacteriosis<sup>104</sup> ranged from 57 to 1181 times lower than parallel estimates for home-cooked chicken in earlier Danish<sup>105</sup> and Belgian<sup>106</sup> QMRAs. Similarly, the estimated per-consumer risk range for raw milkborne HUS (from STEC contamination) for young children in a recent QMRA<sup>107</sup> was 7 to 34 times lower than QMRA estimates for HUS from home-cooked hamburger in the same age group.<sup>108</sup> Adjusted QMRA illness estimates<sup>109</sup> from raw milkborne STEC for persons above age 5<sup>110</sup> appear 6 to 28 times lower than QMRA figures for leafy salad greens at salad bars published by Tromp,<sup>111</sup> Franz and colleagues<sup>112</sup>. Regardless, the risk of becoming ill from consuming raw milk, particularly for immunologically susceptible persons, should not be downplayed: it is clear that this risk is significantly higher than that associated with consuming pasteurized

milk.<sup>113</sup> As such, it becomes important to consider the effectiveness of various non-thermal risk mitigation approaches to improving raw milk's safety profile.

## Risk mitigation

In a 2013 review, Baars distinguishes 'ecological' and 'technological' approaches to risk management for raw milk, describing the body of evidence supporting each.<sup>114</sup> Effective 'ecological' strategies involve farm hygiene and herd management strategies, such as

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maintenance of clean bedding and water troughs; avoidance of higher-risk feeding practices (involving 'concentrates' and distiller grains); and closed-herd policies. Evidenced 'technological' approaches include temperature control (i.e. refrigeration), animal disease testing and culling (e.g. for animals with tuberculosis or brucellosis, and 'persistent STEC shedders') as well as periodic milk testing for key bacteriological markers. Such tests measure 'hygiene' or 'process' markers (such as coliform counts); as well 'zoonotic' markers, for both transmissible diseases (such as tuberculosis) and gastrointestinal pathogens (such as *Campylobacter*, STEC, *Salmonella*).

'Regulatory' approaches offer a third type of risk management strategy, used across numerous jurisdictions to mandate usage of the aforementioned 'ecological' and 'technological' methods.<sup>115</sup> Drawing on fifteen years of microbiological testing data from Germany, where production of raw milk for human consumption is tightly regulated, Baars observes that such a three-fold approach can reduce to 'negligible' or 'very low' the risk of disease from key hazards of concern, including



STEC. Baars furthermore reports that over a fifteen year period in which certified raw milk farmers – operating under strict regulatory conditions – were required to test their milk for pathogens, only a single sample returned positive for STEC. An important distinction made in German regulations is between raw milk produced for *direct human consumption* (i.e. certified raw milk) and raw milk produced for pasteurization.<sup>116</sup> Such a distinction, which recognizes that various production<sup>117</sup> and distribution<sup>118</sup> conditions will result in notably different risk profiles for different raw milks, is increasingly being made in QMRA studies as well.

### Zero risk vs. zero pathogen tolerance

German microbiological standards for certified raw milk are significantly higher than those mandated for raw milk destined for pasteurization in that country, and involve a ‘zero-tolerance’ approach to zoonotic pathogens.<sup>119</sup> Such a ‘zero tolerance’ approach may be seen as distinct from the ‘zero risk’ approach apparently proposed as desirable in North American epidemiological analyses<sup>120</sup> and case reports,<sup>121</sup> which appear to advocate raw milk prohibition as a precautionary measure. For example, in an illness report associated with certified raw milk from the U.S. state of Pennsylvania, Longenberger *et al* asserted:

“Consumers can never be assured that certified unpasteurized milk is pathogen-free, even when from a seemingly well-functioning dairy. The only way to prevent unpasteurized milk-associated disease outbreaks is for consumers to refrain from consuming unpasteurized milk.”<sup>122</sup>

While it is true that mitigation strategies are unlikely to eliminate raw milk’s risk entirely, what is important in this regard are two points. First, as with any food, it is critical that mitigation strategies be maximized to minimize foodborne risk. Second, public health policy across potentially hazardous foods should be made on the basis of a consistent approach to risk management based on evidence. Notably, although leafy green vegetables have been identified as the most frequent cause of foodborne outbreaks in the United States,<sup>123</sup> there is no move to prohibit their sale on the basis that mitigation efforts may at times fall short of eliminating risk entirely. If such a zero-risk approach were indeed more broadly applied, there would be few foods left on the market.

### Benefits of raw milk consumption

The discussion around risk is not complete without consideration of evidenced benefits associated with raw milk consumption. Over the last fifteen years, a considerable body of evidence has amassed pointing to a significant protective effect of raw farm milk in relation to childhood onset allergy and asthma.<sup>124</sup> The 2011 GABRIELA study, involving over 8000 European school-aged children living both on and off farms, was able to provide objective confirmation using blood markers of this long-suspected effect, which is independent of other exposures, and does not appear with pasteurized or heated milk.<sup>125</sup> Although the mechanism of action at play is still hypothetical,<sup>126</sup> raw milk’s heat sensitive whey proteins appear implicated in the asthma protective action.<sup>127</sup> Compelling evidence, described by Loss and colleagues,<sup>128</sup> von Mutius<sup>129</sup> and other immunological scholars<sup>130</sup> is also amassing to show that raw farm milk may enhance newborns’ immunity, when consumed by the mother during pregnancy, or by the infant younger than one year. Although raw milk’s risk profile is largely considered by scientists and public health experts to outweigh the potential benefits,<sup>131</sup> some people’s preference to consume this product can no longer be considered scientifically unfounded.

### Risk Management

Canada’s current federal ban on unpasteurized milk sales, enforced by provincial and territorial governments, has several important shortcomings as a risk management approach. First, it represents a scientifically disproportionate approach to risk management. As evidenced, there remains a clear risk of severe foodborne illness associated with unpasteurized milk consumption, particularly for members of immunologically susceptible populations and this risk is clearly higher than that associated with pasteurized milk. While such risk should be taken seriously from a policy perspective, it does not appear unique or higher than that associated with other common, legally available foods such as home cooked chicken, leafy greens or hamburger. Not only is prohibition’s ‘zero-risk’ ethic around food safety unprecedented in reference to other foods, but it is ineffective in the sense that it has produced an underground raw milk market whose safety profile remains unchecked. In this sense, prohibition – while limiting the large-scale, overt supply of unpasteurized milk to Canadians – produces new risks which are extremely difficult to monitor. Moreover,



this heavy-handed policy approach is likely to further erode raw milk consumers' confidence in important public health messaging, decreasing such messages' effectiveness. Finally, the increasing body of evidence demonstrating clear potential health benefits associated with consuming raw (and not pasteurized) farm milk compromises mandatory pasteurization's status as an intervention with no associated health harms.

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Prohibition is a relatively extreme public health intervention<sup>132</sup> that arguably warrants application only in cases where policy approaches which infringe less on individual freedoms have been exhausted in the pursuit of significant risk reduction.<sup>133</sup> The available evidence with regards to ecological and technological raw milk risk mitigation approaches – particularly from within Germany's regulatory context - demonstrates that such interventions, positioned within a well-monitored regulatory framework, can be highly effective. The fact that Health Canada did not consider regulatory alternatives to prohibition prior to implementation of the ban in 1990<sup>134</sup> is disturbing, especially given the wide variety of approaches to legal raw milk sales implemented across a majority of industrialized nations. Although there may be political and economic barriers to implementing such alternatives, raw milk consumption continues in the Canadian context. In order to effectively reduce the risk of such consumption, especially for immunologically susceptible populations, it is essential that Canada implement more appropriate policy approaches moving forward, beyond the status quo, which incorporate evidence rigorously within its broader sociopolitical context. What follows is a discussion of two policy reform options – federal regulation of raw milk sales, and provincial/territorial

legalization of herdshares – comparing and contrasting each in light of their associated strengths and challenges.

#### **POLICY OPTION A: Regulate raw milk sales federally and market under supply management**

Canada's raw milk 'problem' may be effectively addressed, as in many jurisdictions across the European Union, through nationwide regulation of the product. In Canada's context, this would involve removal of the existing federal ban on raw milk sales and regulating such sales within the nation's existing supply management model. Standards for raw milk intended for direct human consumption ('certified raw milk') could be set under the National Dairy Code, much in the same way the code controls quality for raw milk destined for pasteurization.<sup>135</sup> In line with Germany's evidenced approach to raw milk safety,<sup>136</sup> microbiological standards for such a certified raw milk should be considerably higher than those currently employed provincially<sup>137</sup> and federally for raw milk meant for pasteurization.<sup>138</sup> Furthermore, Germany's zero-tolerance approach for detected pathogens<sup>139</sup> should be adopted under this model. Such a rigorous pan-Canadian standard would meet Health Canada's articulated mandate for protecting public safety, while enabling individual provinces and territories to implement locally-appropriate regulatory frameworks in terms of sale and distribution.

A new quota allotment specific to certified raw milk producers would likely be required in order to make this policy option viable. Implemented on a large scale, management of a certified raw milk pool might eventually be modelled after the organic milk pool, which is picked up daily from farm bulk tanks by provincial industry trucks before centralized redistribution and subsequent sale. However, in light of raw milk's microbial fragility (the increased likelihood of pathogen proliferation in storage and transport), as well as the small market currently represented by raw milk consumers, a smaller-scale distribution model may prove more appropriate in the short term. Such a model, in which certified raw milk is sold exclusively at the source farm in a supply-managed micro-dairy arrangement (in which production, testing and bottling all take place on-site), has recently been proposed by the National Farmers Union (NFU).<sup>140</sup> The NFU's proposal for a pilot project in this vein, suggests that milk might be sold either in farm



stores, or in 'metered vending machines'<sup>141</sup> as in several European jurisdictions.

**Costs:** Implementation of this policy option carries a variety of costs. Health Canada would incur costs associated with the development of standards under the National Dairy Code. Given that such standards development might be informed by those adopted in other jurisdictions – Germany in particular – associated costs could be limited. Canada's dairy industry would be required to invest both nationally and provincially in order to create infrastructure to support raw milk sales. Such industry investment could be relatively minor if raw milk sales were to be piloted using a micro-dairy-based, on-farm sales model as opposed to through retail distribution. If market forces were to eventually demonstrate reliable safety of the product and increased demand, the investment associated with a more extensive retail sales infrastructure for raw milk could be justified. Finally, individual producers seeking to produce raw milk for legal sale would require considerable start-up investment in order to bring their on-farm operations into compliance with the new regulations.

**Benefits:** This policy option carries multiple benefits to various stakeholders. An economic opportunity would be created for new producers, who could market a profitable niche product. With regards to safety, the minority of Canadians who prefer to consume raw milk would thus have legal access to a well-tested product which meets high sanitation standards. As the German case has demonstrated, such a product is considerably less likely to carry disease-causing pathogens. From a public health perspective, fewer raw milk associated disease outbreaks might be expected on a per-consumer basis, due to an elevated production standard. By bringing raw milk out of the underground, consumers would be less likely to consume raw milk meeting lesser safety standards. Clear warning labels on product bottles may deter consumption of raw milk by susceptible populations. Furthermore, legalization of unpasteurized milk sales is likely to increase raw milk consumer confidence in public health messaging, which has been significantly eroded by prohibition. Finally, if raw milk consumption were to increase as a result of legalized access – and the associated sense of consumer trust in the product – health care savings could be accrued as a result of reduced childhood asthma and allergy, which represents a considerable cost burden to the medical system.

**Challenges:** Multiple challenges would likely accompany implementation of this policy option, many of them political. As Charlebois has pointed out, 'getting a bill to legalize raw milk through Parliament will continue to be an uphill battle'.<sup>142</sup> From a governmental perspective, it may prove difficult to justify a significant policy change which, given the predominant (albeit flawed) scientific safety discourse at play in the Canadian context, may

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be interpreted as opening the door to potentially-unsafe dairying. Moreover, the nation's supply managed dairy producers, who largely object to system reforms, may resist the introduction of a new marketable milk stream. Such resistance may also be characterized by a concern that raw milk's relatively higher risk profile over pasteurized milk might pose a threat to the industry's branding of their product as fundamentally wholesome and safe.

The economic dimensions associated with legalizing raw milk sales may also present a challenge. In the absence of existing market research, it may be difficult for industry to justify investment in raw milk production infrastructure. Also, dairy farmers seeking to produce raw milk for direct sale may face challenges associated with producing nutrient-dense raw milk on a small scale within a regulatory model involving high initial quota purchase costs to the farmer. First off, high cost of procuring new dairy quota allotments may prove prohibitive, particularly for the younger farmers who may be most interested in serving this niche market. In addition, the quota model has been designed to manage and market milk of lesser nutrient density on a larger scale. This poses a particular conundrum in terms of meeting consumer specifications for a high-fat, high-protein product from lower productivity cow breeds.





Producers selling raw milk on-farm would be faced with the challenge of maintaining pricing acceptable to consumers. On one hand, this might result in low profit margins for farmers seeking to produce lesser quantities of nutrient-dense products, or on the other hand drive such farmers to produce greater quantities of a leaner product which deviates from consumer specifications. Several of these barriers might be alleviated if provincial marketing boards were to introduce a 'small producer' quota exemption, similar to those in other supply-managed industries (such as eggs<sup>143</sup>).

Regulating raw milk sales within a supply managed model may present additional challenges associated with supply management's current tenuous political position. As noted previously, there are increasing calls for abolition of Canada's dairy supply management regime as part of a trend toward liberalizing markets.<sup>144</sup> Indeed, Canada's long-standing Wheat Board, a parallel supply management system in place since the 1920s, was recently dismantled in 2012. Although a majority of Canada's dairy farmers currently oppose a similar abolition of their industry, some economists predict supply management to have a limited future in light of forthcoming international agreements that may force Canadian dairy farmers to deregulate.<sup>145</sup> It may indeed prove difficult to justify industry expenditure to build infrastructure for a raw milk niche within a marketing model perhaps destined for deregulation.

Finally, although the per-consumer risk of foodborne illness from raw milk consumption would certainly be reduced under this regulatory model, it is conceivable that Canada's health care system might be faced with an overall increase in raw milk associated outbreaks if product availability increased overall raw milk consumption. While such costs may be offset by savings associated with reduced childhood asthma and allergy – which are effectively prevented by consumption of raw farm milk – it is often difficult to track or quantify the benefits of such savings at a population level. Regardless, it is possible that a policy change to legalize raw milk sales may be opposed by scientists and public health officials who remain inadequately informed about: raw milk's comparative risk profile in relation to other common foods; the documented effectiveness of ecological and technological risk mitigation strategies; and emerging high quality evidence of unique benefits from raw milk consumption over pasteurized.

## **POLICY OPTION B: Legalize herdshares at the provincial/ territorial level**

This policy option, in which provinces/territories act to explicitly permit herdshare co-ownership arrangements, would have the aim of securing legal access to raw milk not on a large scale, but for a small, dedicated contingency of consumers willing to invest considerable effort in procuring it. By sanctioning herdshares, provinces give recognition to the fact that raw milk *consumption* is legal in Canada, and that herd owners (such as dairy farmers) enjoy legal access to this product for their own consumption so long as they do not sell it. This approach would require minor regulatory changes at the provincial/territorial level. Although such changes would vary across jurisdictions (since dairying and public health regulations are heterogenous across provinces/territories), such would permit herd co-ownership arrangements, wherein farmers make contracts with non-farming co-owners of a particular dairying herd to maintain and milk their animals for a regular fee. Such arrangements would involve sale of raw milk (only the sale of a share in a dairying herd), and would thus not contravene the federal legislation prohibiting raw milk sales.

Provinces/territories might elect to permit herdshares in their respective jurisdictions under various arrangements. As noted earlier, a number of American states have explicitly legalized herdshares using varying levels of regulatory oversight. In the interests of safety, provincial/territorial herdshare regulations should stipulate that herdshares be required to meet particular hygienic practices and microbiological standards in maintaining the dairy herd and bottling the associated milk. There is an increasing movement of North American herdshare agisters – including Canadian producers<sup>146</sup> – who are voluntarily self-certifying with the Raw Milk Institute (RAWMI), an independent quality assurance body.<sup>147</sup> RAWMI's certification standards are similar to German microbiological safety requirements for certified raw milk. Canadian herdshares whose contracts stipulate that agisters meet such standards would likely pose little risk to public health; indeed, RAWMI standards exceed Canada's National Dairy Code requirements for raw milk destined for pasteurization. Regulations might stipulate that agisters be required to participate in a self-regulating body in their particular jurisdiction in order to maintain high production standards. Stipulations might be made to limit herd sizes, for instance, to a



maximum of 40 Holstein cows or the equivalent in fluid milk production for other dairying varieties. This would maintain the small scale of herdshare operations and distinguish them clearly from supply managed dairies selling milk.

As in those U.S. states where herdshares have been legally sanctioned, such arrangements might variously involve private contracts stipulating conditions of co-ownership as well as 'agistment'. 'Agistment' arrangements for farm animals, in which animal owners

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***There is an increasing movement of North American herdshare agisters – including Canadian producers – who are voluntarily self-certifying with the Raw Milk Institute (RAWMI), an independent quality assurance body.***

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contract with an 'agister' (the individual who cares for their animals as stipulated under the contract), have long been permitted across Canada, and are regulated under such provincial statutes as the Ontario *Innkeepers Act*<sup>148</sup> and the B.C. *Livestock Lien Act*.<sup>149</sup> In order to remain compliant with other federal and provincial regulations, such ownership / agistment herdshare contracts would permit the agister to transfer raw milk only to its rightful owner. As such, no raw milk 'sales' or 'redistribution' would be permitted at any stage of a herdshare transaction. Because herdshares involve a high degree of commitment by herd co-owners, including purchase of the animals, regular milk pick-ups, and ongoing engagement with the management of the herd, it is likely that only the most committed raw milk consumers would participate.

**Costs:** The costs associated with regulating herdshares in a particular jurisdiction would be relatively minor. As changes to regulations rather than laws would be required in most jurisdictions, such could be undertaken with relative ease given the political will. Little government infrastructure would be required, aside from a provincial/territorial registry of herdshares in a given jurisdiction, perhaps requiring regular submission

of microbiological testing results in line with RAWMI standards. Individual producers might accrue minor costs to come into compliance with such standards.

**Benefits:** A primary advantage of this regulatory option is its ease of implementation. Requiring no federal legislative change and no new industry infrastructure, it has few associated costs. Furthermore, herdsharing would permit a mechanism whereby very small scale producers, who may otherwise face economic barriers to entry into the larger-scale supply managed dairying system, might operate successful small on-farm business operations. Herdshares furthermore represent an economically-efficient means of increasing the safety profile of raw milk consumed on a small scale, as well as providing a clear method of tracking potential illness and implementing immediate recalls – all of which prove difficult under current, underground market conditions. Herdsharing, finally, may also be seen as a scale-specific regulatory intervention designed to secure access to fresh local food alongside larger industrial agricultural systems; small-scale regulatory arrangements for other supply managed commodities, such as eggs, are in place across Canada. Such arrangements are important because they allow for a diversified market which specifically includes the smallest producers, while maintaining protection for medium and larger scale producers under supply management.

**Challenges:** By maintaining raw milk accessibility on a very small scale, and requiring considerable consumer effort to procure their co-owned product, herdshare may not effectively remove barriers to raw milk access for many Canadians. Furthermore, the relatively high cost associated with small scale production may maintain raw milk as an expensive niche product inaccessible to lower-income families. Although raw milk herdsharing's small scale, as well as its unique product profile (distinct from any existing market product), pose little economic threat to supply managed dairying, there is a chance that industry stakeholders may perceive it to do so. Moreover, the provincial/territorial character of future herdsharing regulations may produce unequal conditions in terms of raw milk access across jurisdictions; this may, as has been seen in the U.S. (where raw milk laws vary from state to state), produce a new underground market of inter-jurisdictional raw milk trade. Finally, there is a chance that herdshare producers within a particular jurisdiction permitting their operations may not all willingly participate in a regulatory regime which



requires regular milk testing; as such, an underground raw milk distribution network may continue, albeit on a smaller scale. However, it is likely that the reduced threat of enforcement and litigation represented by participation in a herdshare regulatory regime may promote producer buy-in.

## Recommendations

From a public health perspective, removal of the federal prohibition, and regulation of certified raw milk sales under Canada's existing supply management system, is well-supported by international safety evidence of high quality. However, as discussed earlier, considerable political and economic barriers to this eventuality remain in place, which may at present prove difficult to surmount until industry support increases beyond the current one third of dairy producers, to above 50%. As such, regulated herdshares, involving self-regulation and transparent safety mechanisms, currently offer a more viable policy response to the underground raw milk market across many Canadian jurisdictions. Such regulations promise to enhance public safety by reducing activity in an underground sector which is currently difficult to monitor. Legalized herdshares also promise to reduce economic barriers for small scale producers to create successful, locally-supported raw milk related enterprises. Provincial/territorial implementation of a herdshare model might furthermore provide a more accurate means of assessing market interest in raw milk, difficult under current regulatory conditions, where raw milk related transactions typically occur underground. Should consumer interest prove high, a greater industry impulse to invest in the federal regulation of raw milk sales might over time take hold, producing the political conditions for a more ideal outcome: federal legalization of certified raw milk sales across Canada.

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