



Sale of Raw Milk to Consumers

Regulatory Impact Statement

ISBN No: 978-0-908334-41-4 (online)

June 2015

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Regulatory Impact Statement

Agency disclosure statement

This Regulatory Impact Statement (RIS) has been prepared by the Ministry for Primary Industries (MPI). It provides an analysis of options and scenarios to address the sale of raw milk to consumers in New Zealand.

There are some constraints on the analysis:

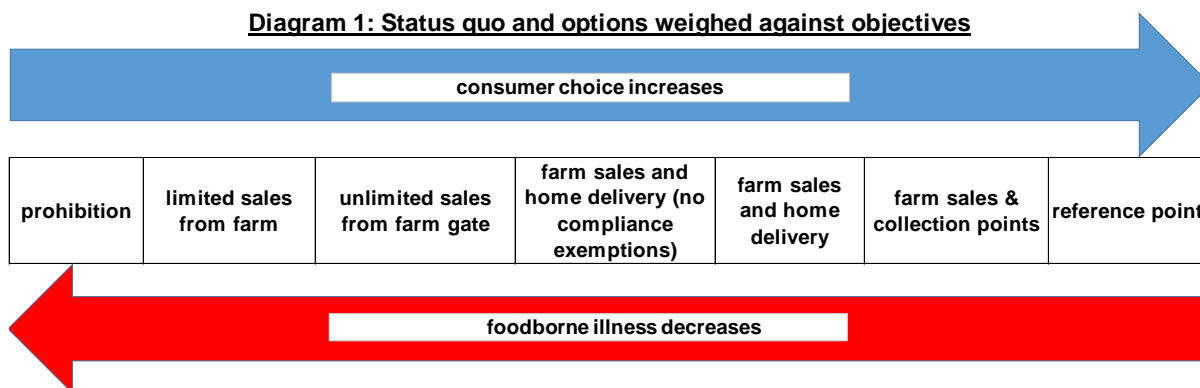
- *Key gaps in the data:*
 - the size of the industry – this information is lacking because many dairy farmers selling raw milk to consumers do not advertise widely (or at all), and none are registered with MPI specifically for that activity as required under the Animal Products Act 1999 (APA). Despite this, MPI has gathered information from an online self-selected survey conducted in 2014;
 - the volume of raw milk sold and the number of people consuming raw milk – information is available from surveys but it is not necessarily representative of all consumers of raw milk in New Zealand;
 - foodborne illnesses – these are not always reported or notifiable. It is not always possible to associate a reported foodborne illness with a definitive food source, such as raw milk, and not all outbreaks associated with raw milk consumption are necessarily the cause of illness;
 - the number of farmers who would have to modify their operations, or cease to supply, under the proposed options and scenarios.
- *Time constraints, including the nature and cause of the constraints:* regulatory changes must be in place by 1 March 2016 when the Food Act 2014 commences in full and revokes the Food Act 1981; otherwise all sales of raw milk, including retail, will be permissible. The new Act is silent on the sale of raw milk to consumers because it was intended that regulations under the Act be developed to reflect the agreed policy.
- *Further work is required before any policy decisions can be implemented:* once the policy for the sale of raw milk to consumers has been determined, MPI will work with the Parliamentary Counsel Office to develop regulations. MPI will also undertake consultation on technical specifications, which will be issued via notice by the Director-General of MPI.

Karen Adair
Director
Food and Regulatory Policy
/ /2015

Executive summary

1. Section 11A of the Food Act 1981 allows farmers to sell up to 5 litres of raw milk at any one time from their dairy premises (farms) to people wanting to consume it themselves or give it to their family. Dairy farmers must also comply with other general requirements in the Food Act 1981 and production and food safety requirements in the Animal Products Act 1999 (APA).
2. New regulations must commence by 1 March 2016 when the Food Act 1981 is revoked (thereby revoking the restrictions on the sale of raw milk) and the new Food Act 2014 commences. The new Act is silent on the sale of raw milk to consumers because it is intended that regulations will be developed under the Act to reflect the agreed policy.
3. Consuming raw milk carries the risk of foodborne illness. This risk is exacerbated by the current regulatory regime for consumption of raw milk, which is difficult to interpret and enforce. Managing this risk has to be balanced against an expectation on the part of many consumers that they will be able to purchase raw milk for drinking.
4. The Ministry for Primary Industries' (MPI's) overarching objective is to manage the risks to public health while recognising that a strong demand exists for raw milk from consumers in both rural and urban areas. Consideration also needs to be given to New Zealand's reputation among its trading partners as a producer of safe food, particularly dairy food, which is associated with the public health risk. Finally, it is important to provide regulatory certainty for consumers and farmers.
5. MPI consulted with stakeholders on the sale of raw milk to consumers in 2011 and 2014. Submitters expressed diverse and strong opinions.
6. This Regulatory Impact Statement (RIS) compares five options and two scenarios against decision criteria that reflect the overarching objective. The RIS also offers an indicative analysis of the range of costs and benefits from prohibition to the reference point (attached as Appendix I).
7. This RIS does not express a preferred option. In general terms, the food safety risks increase the further one moves from prohibition to the reference point of retail sales. Conversely, the level of consumer choice decreases as one goes from the reference point (retail sales) to prohibition (see Diagram 1). The option chosen by the Government must reflect its preferred balance between these two objectives.

Diagram 1: Status quo and options weighed against objectives



Status quo and problem definition

What is raw milk?

8. Raw milk is untreated milk from all milking animals, such as cows, goats, buffalo and sheep. It has not been altered in any way. It has not been pasteurised, homogenised, dried or frozen, and nothing has been added or removed.

Status quo (reference point)

9. Status quo is generally used to refer to the current situation. From a policy perspective, analysis is undertaken by comparing policy options with the status quo. However, for the sale of raw milk to consumers, the current situation will change if nothing is done (because the existing legislation will lapse). The term “reference point” is used in this report instead of “status quo” to describe the situation that will ensue if no decisions are made. This is to distinguish it from status quo meaning current situation.
10. The reference point is included in this analysis for completeness and to be consistent with the RIS and cost benefit analysis (CBA) practice of comparing the regulatory options with the scenario of “doing nothing”. Its inclusion is not to suggest that doing nothing is a feasible scenario for government. Indeed, in many points in the RIS, the options are compared with the current situation (rather than the reference point) or with each other, as this is more analytically meaningful than comparison with a hypothetical situation that will not eventuate.

Reference point – retail sales and no specific production or food safety controls

11. In the absence of any further government action or decisions, the current provisions of the Food Act 1981 will be revoked and no new regulations will take their place. This would result in a situation where there would be:
 - retail sales – raw milk would be able to be freely purchased from any retail outlet (for example, supermarkets, farmers’ markets and organic food shops);
 - no limits on the quantity of raw milk sold or purchased;
 - limits on the level of pathogens allowed in raw milk (to conform with the Australia New Zealand Food Standards Code, as explained below) but no specific production and food safety controls. In the absence of further regulation, generic production requirements would apply that do not address the risks associated with raw drinking milk;
 - minimal labelling requirements that would not adequately inform consumers of the risks associated with drinking raw milk and how best to manage them (but simply state that the milk is unpasteurised).
12. To provide context, the following section describes the features of the raw milk market in New Zealand and existing legislation.

Features of the market

13. MPI considers the following information indicates an increase in raw milk consumption in recent years, particularly in urban areas:
 - nearly 1 percent of New Zealand adults consumed raw milk in 2009, based on national nutrition survey data, with up to half of them probably living and/or working on dairy farms;¹

¹ Ministry for Primary Industries (2013) *Assessment of the microbiological risks associated with the consumption of raw milk*, MPI Technical Paper No: 2014/12. Ministry for Primary Industries; Wellington. <http://www.foodsafety.govt.nz/elibrary/industry/raw-milk-sales-2014/2014-12-microbiological-risks-assessment-consumption-of-raw-milk.pdf>. Accessed 19 May 2015.

- 5 percent of respondents in an MPI-commissioned telephone survey of 1,010 New Zealand adults in April 2014 stated that they currently consume raw milk;
 - an online self-selected survey of buyers and sellers of raw milk in 2014 found that:
 - 70 percent of respondents were from urban areas;
 - a quarter of the respondents whose households drank or used raw milk provided it to children aged five years or under, 40 percent gave it to six- to 18-year-olds, 7 percent to adults aged over 70 years, 3 percent to pregnant women and 5 percent to immune deficient people;
 - the main drivers for purchasing raw milk were taste, quality (raw milk was seen as “natural” and better quality than processed milk) and health benefits. The food safety risks were considered to be small while the health benefits were large. (An MPI literature review found no conclusive scientific evidence to suggest that pasteurisation removes any nutrition or health benefits provided by raw milk.²)
14. The number of farmers supplying raw milk to consumers is small as a proportion of the dairy industry. It is difficult to accurately gauge the size of the industry because many suppliers do not advertise widely (or at all). No farmers selling raw milk directly to consumers have registered a risk management programme (RMP) for this activity with MPI, as is required under the APA.
15. In 2014, the Raw Milk Producers’ Association (the Association) informed MPI that it had 54 members. The Association’s President estimated there were at least the same number of farmers selling raw milk to consumers who were non-members. This is similar to the findings in a 2014 MPI self-selected survey where 74 respondents identified themselves as current sellers of raw milk to consumers.
16. MPI does not currently have reliable data on the volume of raw milk sold. The 2014 MPI self-selected survey indicated that the total quantity currently sold is around 20,000 litres per week.

Existing legislation and regulations

17. Three pieces of legislation currently govern the production and supply of raw milk to consumers. These Acts all apply to commercial production, processing and sale of food. “Sale” includes bartering of food, and advertising and promoting trade through giving away food.
18. The pieces of legislation are:
- the Food Act 1981, which governs the sale of raw milk. This will be repealed on 1 March 2016 and replaced with the Food Act 2014, which comes fully into force from 1 March 2016;
 - the APA and its associated regulations and notices, which regulate production and food safety measures;
 - the Australia New Zealand Food Standards Code (implemented in New Zealand law via standards under the Food Act 1981), which sets microbiological limits and labelling requirements for raw milk.

² Ministry for Primary Industries (2013) *An assessment of the effects of pasteurisation on claimed nutrition and health benefits of raw milk*, MPI Technical Paper No: 2014/13. Ministry for Primary Industries; Wellington. <http://www.foodsafety.govt.nz/elibrary/industry/raw-milk-sales-2014/2014-13-Assessment-of-effects-of-Pasteurisation-on-Claimed-Nutrition-and-Health-Benefits-of-Raw-Milk.pdf>. Accessed 19 May 2015.

Food Act 1981

19. Section 11A of the Food Act 1981 allows farmers to sell up to 5 litres of raw milk at any one time from their farms to people wanting to consume it themselves or give it to their family.
20. Sales of raw milk to consumers were introduced into legislation when pasteurisation of milk for town supply became compulsory in the 1940s. The original intent was to allow limited sales from the farm for consumers who could not access town (pasteurised) milk and/or wanted to be able to purchase raw milk.
21. There are a number of difficulties with the interpretation and enforcement of section 11A. These include:
 - a lack of clarity on the purchase limit. The current wording “at any one time” could be interpreted as the same person being able to make several purchases over the course of a day as long as each purchase did not exceed 5 litres;
 - consumers collecting raw milk in places other than the farm due to advances in technology. Consumers no longer have to go to the farm to pay for raw milk because they can purchase it via the internet. Payment online could be legally interpreted as meeting the requirements of section 11A. Consumers have consequently formed raw milk clubs, whereby members buy milk from a farmer over the internet and the farmer delivers the milk to a common pick-up point, such as a health-food store or someone’s fridge in a garage. However, the intention of section 11A was to require consumers to physically go to the dairy farm (the place where animals are milked and where milk is stored or treated) to pay for and collect their milk;
 - no specific offence or penalty provisions are associated with section 11A.

Animal Products Act 1999

22. Raw milk is an animal product, so its production is covered under the APA. The APA, and legislation made under it, requires that all animal products, including ingredients, must be fit for their intended purpose.
23. With few exceptions, the APA requires operators producing animal products to operate under an RMP that is specifically designed for the food they produce and its intended purpose. An RMP is a written programme that identifies and manages the food safety hazards to ensure the product is fit for the intended purpose. Domestic market RMPs are verified regularly, generally on an annual basis.
24. All farmers selling raw milk to consumers are therefore required to operate under an RMP that specifically covers this activity, regardless of whether they own one dairy animal³ or have a large commercial herd, or operate under an RMP for selling raw milk for further processing. The requirements also apply to any person in a cow share agreement who physically milks the animal for drinking in its raw state.
25. No farmer currently has a registered RMP that specifically manages the risks for raw milk sold to consumers. MPI does not consider it possible to design an RMP that would meet the regulatory requirements under the APA and has therefore not actively enforced the requirement.

Australia New Zealand Food Standards Code

26. The standards under the Australia New Zealand Food Standards Code (the Code) are for both New Zealand and Australia and are issued under the Food Act 1981.

³ Dairy animal is used throughout this document to refer to cows, goats, sheep or any other animal from which raw milk may be produced.

Microbiological limits and labelling requirements under the Code apply to raw milk sold to consumers.

27. In most circumstances, raw milk sold to consumers is exempt from general labelling requirements because it is packaged at the farm, often in the presence of the purchaser. However, the name of the food and directions for its storage and use must be provided. A mandatory advisory statement to the effect that the product has not been pasteurised must also be provided, either to the consumer on request (this may be verbal) or displayed on or in connection with the display of the food (including raw milk sold via a vending machine). The dairy farmer must also comply with any other applicable requirements in the Code around nutritional and health benefit claims.

Summary of factors contributing to increased sales under the current situation

28. Overall, the following factors are contributing to an increase in the sale of raw milk to consumers:
- consumer interest in unprocessed foods: this interest is mainly driven by the belief that pasteurisation and other treatments of milk remove health benefits provided by raw milk (see paragraph 13);
 - internet sales: these allow collection from places other than the farm (see paragraph 21);
 - collection points: these have not been tested in the courts because there is a lack of specific offence provisions relating to raw milk sales for consumers (see paragraph 21);
 - unenforceable production requirements (see paragraph 25);
 - labelling provisions: these do not sufficiently inform consumers of the risks of drinking raw milk (see paragraphs 26–27).

Problem definition

29. The problem MPI is seeking to address is that the availability and consumption of raw milk has gone beyond the intent of the regulatory regime for the sale of raw milk to consumers, leading to an increased risk of foodborne illness.
30. The regulatory regime contained in the Food Act 1981 will be revoked in March 2016 allowing for all forms of sale of raw milk, including retail. In the absence of any regime to replace it, the already high risks of foodborne illness arising from consuming raw milk and harm to New Zealand's reputation as a supplier of safe food would increase further.
31. These risks have to be balanced against a strong demand from consumers in both rural and urban areas that they can continue to purchase raw milk.
32. The size and importance of this problem are discussed in further detail below.

Intent and current sales

33. The original intent of the legislation, and the current extent of consumption, is addressed above (see paragraphs 9 and 10 under "Status quo").

Increased food safety risks

34. Drinking raw milk is high risk because without heat treatment, such as pasteurisation, it is more likely to contain pathogens (micro-organisms that cause illness). Vulnerable consumers, such as infants, young children, the frail elderly, pregnant women and those with compromised immune systems, are most at risk of becoming ill from pathogens that may be present in raw milk, and of suffering the most severe symptoms. These

groups were strongly represented as consumers in the 2014 MPI self-selected survey (see paragraph 13).

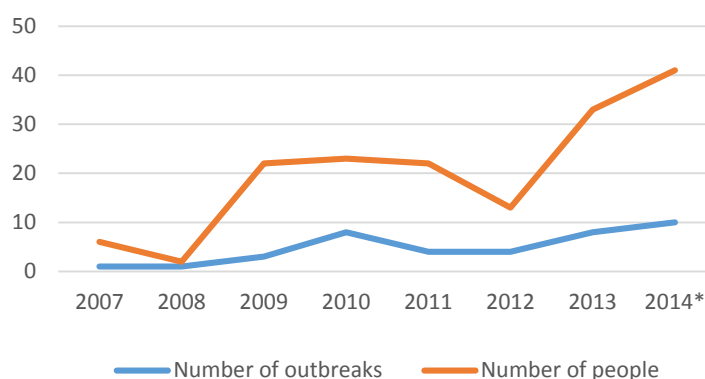
35. An MPI quantitative risk analysis conducted in 2014⁴ indicates that:
- consumption of raw cows' milk will continue to result in an appreciable number of cases of illness in New Zealand;
 - *Campylobacter* species (spp) and Shiga toxin-producing pathogenic *Escherichia coli* (*E. coli*) (STEC) are the pathogens of most concern associated with New Zealand raw milk. The case numbers will vary, depending on where the raw milk is acquired and how it is handled along the distribution chain. *Campylobacter* spp. presents the greatest risk at the farm gate while the risk from *Salmonella* spp. and STEC increases as the number of steps in the supply chain increase;
 - increased consumption of raw milk corresponds to a proportional increase in the predicted number of illnesses;
 - the risk of campylobacteriosis for the urban population is about five times greater than for the rural population with acquired immunity (such as is observed in on-farm residents);
 - an increased duration of time between the production and consumption of raw milk is strongly associated with a rise in the predicted number of illnesses;
 - no animal husbandry practices exist that can ensure raw milk will be free from pathogens.
36. Infection with *Campylobacter* spp. is the most common illness associated with consumption of raw milk. The illness typically lasts a week and can result in muscle pain, headache and fever, diarrhoea, abdominal pain and nausea. In some cases, it can lead to chronic health problems such as reactive arthritis and Guillain-Barré syndrome. Infection with STEC can be more severe because symptoms include severe bloody diarrhoea and, in some cases, kidney failure, particularly amongst young children. In rare cases, it may result in death.
37. Since 2009, consumption of raw milk has increased and, correspondingly, so have outbreaks⁵ of illnesses associated with raw milk,⁶ as shown in Figure 1 below. Provisional data for 2014 indicates there were 10 outbreaks of illness associated with raw milk consumption affecting 41 people. For three outbreaks, raw milk consumption was determined to be the cause. Nine outbreaks involved children. The consumption of raw milk has also been identified as a risk factor for sporadic (one-off) cases of illness. Five children, all of whom consumed raw milk, were hospitalised in 2014 with STEC infections.

⁴ Ministry for Primary Industries (2013) *Assessment of the microbiological risks associated with the consumption of raw milk* (MPI Technical Paper No: 2014/12). This was also summarised in Appendix 1 of the 2014 MPI discussion paper *The sale of raw milk to consumers* (MPI Public Discussion Paper No: 2014/22).

⁵ A foodborne outbreak is when two or more people develop the same illness from the same contaminated food or drink. Data on reported outbreaks of disease is collected on behalf of the Ministry of Health by the Institute of Environmental Science and Research. Many cases of illness are under-reported because people often do not seek medical assistance or follow-up with medical requests.

⁶ Raw milk may not be the cause of all outbreaks associated with its consumption. Other risk factors may include contact with animals, untreated water and poor refrigeration of food.

Figure 1: Outbreaks of illness associated with consumption of raw milk and the number of people who were affected in the outbreaks⁷



* 2014 data is provisional

38. The incidence of illness would almost certainly increase under the reference point, due to the increased availability and consumption of raw milk combined with no specific control measures in the legislation.
39. Internationally, there are many well-documented outbreaks of illness caused by raw milk consumption.⁸ A recent study in the United States (US) found a four-fold increase in the average number of outbreaks related to raw milk over the period 2007 to 2012, compared with figures from 1993 to 2006.⁹ An increase occurred in raw milk consumption over this period, which was concurrent with an increase in the number of states changing their policy from prohibition to allowing sales to occur.
40. It is difficult to directly compare outbreaks of illnesses associated with the consumption of raw milk against different regulatory measures. Factors such as the specific control measures that apply, the degree to which control measures are monitored, complied with and enforced, the innate immunity and pathogen profile within each country, and consumption of raw milk per capita are all influential.
41. In addition, different countries have different surveillance systems on illnesses and this will affect the number of outbreaks of illness recorded.
42. MPI acknowledges that many consumers of raw milk do not consider there is a risk associated with drinking it. These views are summarised below under “Consultation”, along with MPI’s response.

New Zealand’s reputation as a supplier of safe food

43. The reference point is a permissive regime, and a predicted increase in illnesses would result in a corresponding increased risk to New Zealand’s reputation as a supplier of safe food.
44. New Zealand has become a major supplier of food internationally, because consumers and governments around the world have come to trust the New Zealand brand. The integrity of New Zealand’s systems and confidence in our food are reasons why the

⁷ Data is provided from the national notifiable disease surveillance system (EpiSurv), managed by the Institute of Environmental Science and Research, Wellington.

⁸ Langer, A J; Ayers, T; Grass, J; et al (2013) Non-pasteurised dairy products, disease outbreaks, and state laws – United States, 1993–2006. *Emerging Infectious Diseases* 18(3): 385–391. European Food Safety Authority (2015) Scientific opinion on the public health risks related to the consumption of raw drinking milk. *EFSA Journal* 13(1): 3940. <http://www.efsa.europa.eu/efsajournal>. Accessed 19 May 2015.

⁹ Mungai, E A; Behravesh, C B; Gould, L H (2015) Unpasteurised milk – USA: Infection risk, 2007–2012. *Emerging Infectious Diseases* 21(1): 119–122.

food sector accounts for more than 10 percent of the country's gross domestic product and employs one in every five employees.

45. While raw milk is not exported, and would not be under any of the options analysed in this paper, a residual risk remains that any outbreak of foodborne illness associated with raw milk in New Zealand may be reported overseas. This could cause concerns to New Zealand's trading partners and undermine negotiations for equivalence of our food safety regime. A perception of a flawed system may undermine New Zealand's reputation as a supplier of safe food (although there would be no risk of foodborne illness from New Zealand raw milk occurring in any overseas markets).

International approaches to the sale of raw milk

46. No international consensus exists on the policy for sales of raw milk to consumers. Scotland, Canada, Australia,¹⁰ several European countries (for example, Norway, Poland and Spain) and a little under half the states in the US prohibit sales. Other countries allow sales but with restrictions. For example, in England, Wales and Northern Ireland raw milk can be sold direct from the farm premises, in a farmhouse catering operation, at a farmers' market and from a vehicle used as a shop premise. Germany, France and some US states permit farm gate sales and sales in certain retail outlets.

¹⁰ In Australia, the sale of raw cows' milk is prohibited. Four Australian states permit the sale of raw goats' milk.

Objectives

47. MPI's overarching objective is to manage the risks to public health from the consumption of raw milk while recognising there is a strong demand for it from consumers in both rural and urban areas. Managing the risk to public health is also critical in protecting New Zealand's international reputation as a producer of safe food. Finally, it is important to provide a clear regulatory regime and certainty for consumers and farmers.
48. MPI's objectives have been derived from the purposes of the Food Act 2014 and the APA and are (amongst other things) to:
 - achieve the safety and suitability of food for sale;
 - maintain confidence in New Zealand's food safety regime; and
 - provide certainty for food businesses in relation to how the requirements of the Acts will affect their activities.
49. The following decision criteria have been derived to assess the options:
 - **decision criteria 1: food safety** – in line with the purpose of the Food Act 2014 and APA, any new regulations will aim to achieve the safety and suitability of food for sale, provide for risk-based measures that minimise and manage risks to public health and, consequentially, protect New Zealand's reputation as a supplier of safe food;
 - **decision criteria 2: consumer purchase of raw milk** – any new regulations will aim to allow rural and urban consumers to be able to continue to purchase raw milk for their personal consumption or that of their family; and
 - **decision criteria 3: certainty** – any new regulations will aim to ensure that the obligations of buyers and sellers of raw milk are clear and readily enforceable and that the new rules are likely to be complied with.
50. MPI is aware that the options will affect not just consumers but also suppliers of raw milk. For example, some options may result in some suppliers exiting the market for raw milk.¹¹ Some of the suppliers who exit the market may lose the value of assets they have purchased to support their supply of raw milk if they cannot resell those assets (for use in pasteurised milk production, for example). MPI acknowledges this possibility but does not have sufficient information on how many suppliers would be in this category to use it as a criteria to distinguish between options.

Options and Impact Analysis

51. An RIS is required to identify the full range of practical options (regulatory and non-regulatory) that may wholly or partly achieve the policy objectives. MPI publicly consulted on the sale of raw milk to consumers in 2014 (see paragraphs 111–116). The discussion document eliminated the following approaches from consultation because they were considered unlikely to satisfy the policy objectives:
 - *non-regulatory control measures*: self-regulation, as the sole safety control measure, would likely lead to an increase in raw milk-associated illnesses. It is unlikely that all farmers would commit to, or rigorously follow, a voluntary code if developed by industry alone. Also, the control measures would likely be less

¹¹ A range of situations exist under which suppliers might exit (for example, small suppliers who cannot remain viable once a compliance safety regime is fully implemented (option 4) or large operators who cannot remain viable with a limit on the quantity they can sell (option 1)). Suppliers who are currently operating de facto collection points would have to cease or modify their operations under options 1–4. It is possible that some small suppliers would exit under the reference point (retail sales) as increased sales volumes might favour larger players. Suppliers would also exit under prohibition (as they would not want to break the law).

stringent than those developed by government. No other food that poses a similar risk to raw milk is controlled by self-regulation in New Zealand;

- *sale at retail outlets (for example, supermarkets, organic food stores, cafes, restaurants, rest homes):* the potential number of people who would have access to raw milk presents too great a health risk, given our scientific assessment predicts that foodborne illness would increase due to increased consumption and deaths could potentially occur;
- *sale at farmers' markets:* under this scenario, consumers would pre-order raw milk from the farmer, who would provide it to the consumer at a farmers' market. Farmers' markets can be large retail operations. This means large numbers of people, who are not aware of the different food safety risks of consuming raw milk, could become opportunistic buyers. Increased exposure is predicted to increase the likelihood of illnesses occurring.

52. Five feasible options that may wholly or partly achieve the policy objectives have been identified as follows:¹²

- option 1 – *farm sales with limits* on the quantity sold and purchased;
- option 2 – *farm sales with no limits* on the quantity sold or purchased;
- option 3 – *farm sales and home deliveries with no limits* on the quantity sold or purchased and *with production and food safety exemptions* for lower quantities sold;
- option 4 – *farm sales and home deliveries with no limits* on the quantity sold or purchased and *no production and food safety exemptions* for lower quantities sold;
- option 5 – *farm sales and collection points* with no limits on quantities sold or purchased.

53. Two other scenarios are considered in the analysis:

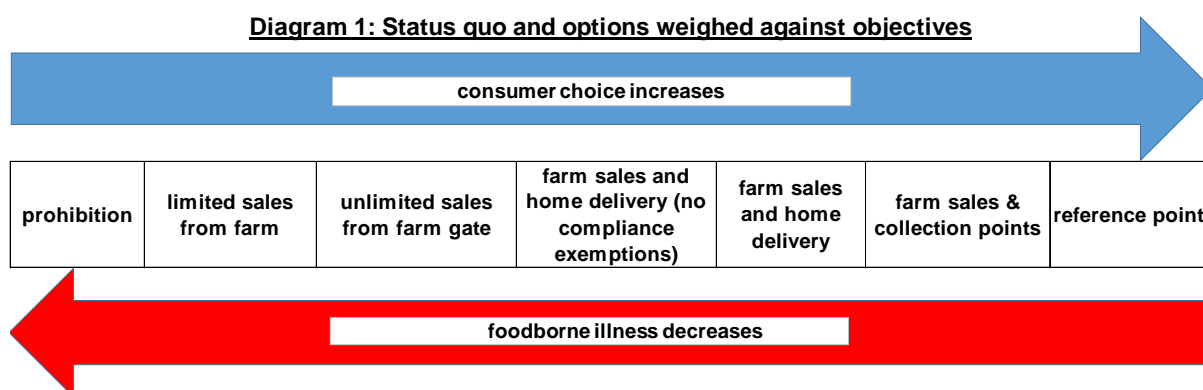
- prohibition – the Government decided before the consultation in 2014 (see paragraph 106) that prohibition was not an option for consideration. However, it is analysed in this RIS because most dairy processors, public health agencies and veterinarians strongly supported prohibition during consultation;
- the reference point (for reasons discussed above).

54. Options 1 to 5 come with a number of “givens”. Many of these are implied but not currently specified in regulation, others have been the subject of consultation in 2014. They are:

- raw milk will not be exported;
- raw milk will not be on-sold;
- raw milk sales will be direct from the farmer to consumer;
- all farmers selling raw milk will follow a regulated control scheme (RCS) for raw drinking milk. An RCS is a prescriptive set of risk management measures intended to protect the health of consumers by reducing risk factors as much as reasonably possible. It is a single set of measures imposed on all operators and does not allow for flexibility. An RCS is used when it is inappropriate or impracticable to manage risk factors under an RMP;
- records of sale must be kept (that is, customer details, date of raw milk purchase and volume);
- additional labelling requirements will apply to better inform consumers about the risks associated with drinking raw milk and how to reduce them;
- penalty and offence provisions will apply under the new regulatory regime.

¹² Note that options 1, 2 and 3 were consulted on in MPI's discussion paper *The sale of raw milk to consumers* (MPI Public Discussion Paper No: 2014/22, May 2014). Options 4 and 5 were developed following consultation. Prohibition was proposed by submitters.

55. Among the benefits of these provisions are:
- production and sales requirements and obligations would be clear;
 - labelling requirements would ensure full information on health risks and reduce misleading information from being circulated;
 - penalty and offence provisions would make it easier to enforce the new regulatory regime.
56. The options and scenarios are illustrated in Diagram 1, with prohibition at one end of the spectrum and the reference point (retail sales) at the other. The food safety risks generally increase the further one moves from prohibition to the reference point, while the level of consumer choice decreases as one moves from the reference point to prohibition.



Qualitative Analysis and Indicative Cost Benefit Analysis

57. This RIS includes:
- a qualitative assessment of the options and scenarios against the decision criteria; and
 - an indicative CBA of the options and scenarios to regulate the sale of raw milk (see Appendix 1).
58. In regard to the CBA, the information available to calculate the costs and benefits is limited. Some information exists that can be used to estimate the current quantity of raw milk consumed, price and health impacts. Beyond this, assumptions must be made to estimate the costs and benefits under scenarios and the options.
59. Because of these limitations, the CBA estimates the reference point and compares this with assumed changes under the most restrictive option – prohibition. This gives an indicative range of the costs and benefits. It is reasonable to assume that all of the options fit within this range, including the current situation.
60. The following quantities are estimated:
- public health costs;
 - taxation loss (from worker illness);
 - costs of government compliance activity;
 - consumer surplus.
61. For some quantities, insufficient information exists to allow an estimation. These are:
- benefits associated with improvement in New Zealand’s food safety reputation;
 - losses for suppliers who exit the market.
62. Table 1 provides a summary of the costs and benefits, along with a description of the unquantified costs and benefits. The latter are included as a reminder that not all the costs and benefits have been quantified. Table 2 provides a summary of the qualitative analysis of policy options and scenarios against the decision criteria.

Table 1: Summary of the indicative range of costs and benefits for prohibition compared with the reference point (retail sales) and current situation

	Prohibition	Current (to 1 March 2016)	Reference point (retail sales/no controls)
Quantified			
Public health (cost) (attachment 2)	\$260,000 - \$560,000	\$1,000,000 - \$2,200,000	\$1,600,000 - \$3,600,000
Taxation loss due to illness (cost) (attachment 3)	\$29,000 - \$63,000	\$120,000 - \$251,000	\$180,000 - \$380,000
Consumer surplus (benefit) (attachment 4)	\$440,000 - \$730,000	\$1,800,000 - \$2,900,000	\$2,600,000 - \$4,400,000
Compliance activity (cost)	\$290,000 - \$550,000	\$290,000 - \$550,000	Undetermined
Unquantified			
Risk to New Zealand food safety reputation	Low	Medium	High
Loss to suppliers who exit market	Unknown	Nil	Unknown

Note: All values are in New Zealand dollars per year and rounded to two significant figures.

Table 2: Summary of qualitative analysis of policy options and scenarios for the sale of raw milk against decision criteria

	Prohibition	Option 1 Farm sales with limits on the quantity sold and purchased	Option 2 Farm sales with no limits on the quantity sold or purchased	Option 3 Farm sales and home deliveries with no limits on the quantity sold or purchased, and with production and food safety exemptions for lower quantities sold.	Option 4 Farm sales and home deliveries with no limits on the quantity sold or purchased, and no production and food safety exemptions for lower quantities sold.	Option 5 Farm sales and collection points with no limits on the quantities sold and purchased	Reference point Retail and food service sales
Summary of the options and scenarios	The sale of raw milk to consumers would be illegal.	Sales would be direct from the farmer to consumer and collection would be from the farm only. Very limited sale quantities would apply – 6 litres or less of raw milk could be purchased per day and 40 litres could be sold per day. Production and food safety controls (including labelling) would apply. Controls such as verification, pathogen testing and milk harvesting training would not be included.	Sales would be direct from the farmer to consumer and collection would be from the farm only. No quantity limits on the amount sold or purchased. Production and food safety controls under option 1 would apply to farmers selling 40 litres or less per day. Additional production and food safety controls would apply to farmers selling more than 40 litres per day (such as verification, pathogen testing and milk harvesting training).	Option 2 plus: home deliveries by the dairy farmer directly to the purchaser's place of residence only, provided: • the farmer sells 40 litres or more per day and meets higher food safety controls; • the purchaser pre-orders raw milk.	Option 3 but there would be no production and food safety exemptions for farmers selling lower quantities (that is, there would be the same (higher) requirements for all farmers).	Option 2 plus: deliveries via collection points (but excluding home deliveries), provided: • the farmer sells 40 litres or more per day and meets additional food safety controls (including transport and refrigeration controls); • the purchaser pre-orders raw milk.	Retail and food service sales (that is, no requirement to be direct from the farmer to consumer and no quantity limits). No specific production and food safety controls would apply.
Food safety	✓ Consumption of raw milk and associated illness would decrease compared with the current situation, although overseas experience shows prohibition does not eliminate the risk to public health.	✓ Consumption of raw milk and associated illness would decrease compared with the current situation.	✓ Would likely reduce consumption of raw milk and associated illness compared with the current situation.	? Consumption and foodborne illness could either decrease or increase compared with the current situation.	✓ ? Consumption and foodborne illness could increase or decrease compared with the current situation, but risk is less than for option 3 (same food safety requirements for all quantities) and collection points.	✗ Would result in greater likelihood of foodborne illness than the current situation.	✗ Greatest access and consumption and level of foodborne illness.
Allows rural and urban consumers to be able to continue to purchase raw milk	✗ No choice for consumers – sales would be illegal.	✗ Limited choice for urban consumers compared with the current situation.	✗ Limited choice for urban consumers compared with the current situation.	✓ Similar level of choice as the current situation, but home deliveries will replace collection points.	✓ Similar level of choice as the current situation, but home deliveries will replace collection points.	✓ Greater choice for rural and urban consumers than the current situation.	✓ This scenario would allow for the maximum level of consumer choice.
Certainty • Clarity and certainty of rules • Likelihood of compliance	• Sales illegal so certainty for buyers, sellers and compliance officers. ✓ • Illegal activity (a black market) likely and enforcement of prohibition onerous. ✗	• Greater certainty than the current situation for buyers, sellers and compliance officers. ✓ • Greater likelihood of compliance than under prohibition, but still some illegal activity due to restriction on farm sales and enforcement onerous. ✗	• Greater certainty than the current situation for buyers, sellers and compliance officers. ✓ • Greater likelihood of compliance than under prohibition and option 1, but still some illegal activity due to restriction on farm sales and enforcement onerous. ✗	• Greater certainty than the current situation for buyers, sellers and compliance officers. ✓ • Greater likelihood of compliance than under prohibition and options 1 and 2, but still some illegal activity due to restriction on farm sales, for example, de facto collection points. ?	• Greater certainty than the current situation for buyers, sellers and compliance officers. ✓ • Greater likelihood of compliance than under prohibition and options 1 and 2, but still some illegal activity due to restriction on farm sales, for example, de facto collection points. ✓ ?	• Difficult to define and distinguish collection points from retail sales. ✗ • Difficult to assess level of compliance (because of lack of clarity in rules). ?	• Certainty for consumers, who would be able to purchase from a variety of retail outlets. ✓ • Likely to be high levels of voluntary compliance (so less need for enforcement). ✓

Key: ✓ = the objective is likely to be met; ✗ = the objective is not likely to be met; ? = the outcome is unknown. Not all ✓ and ✗ are of equal weighting.

Analysis of options and scenarios

63. This analysis generally compares the options and scenarios with the current situation because this is more meaningful, given that the reference point is not a feasible scenario for government.

Prohibition

64. Banning sales of raw milk to consumers would mean that raw milk would have to be processed to kill pathogens (for example, pasteurised) in order to be sold.

Decision criteria 1: food safety

65. The main advantage with prohibition would be reduced consumption and illnesses resulting from drinking raw milk compared with the current situation. This would reduce costs to the healthcare system and to work productivity, and protect New Zealand's reputation for safe food.
66. However, illegal sales would likely occur, given New Zealand's history of allowing limited sales and the strong consumer demand. This would be associated with outbreaks of illnesses, which would be exacerbated by the lack of regulated food safety controls. People would be unlikely to report that they had consumed raw milk if they became ill for fear of prosecution, so illnesses associated with drinking raw milk would likely be undetected. Experience overseas illustrates that prohibition does not eliminate the risks to public health.

Decision criteria 2: consumer purchase of raw milk

67. There would be no consumer choice under prohibition. There would be no recognition of New Zealand's tradition for some raw milk sales to consumers, nor of the desire of some people to make products from raw milk (for example, cheeses) for their own or their families' consumption. Prohibition would not be consistent with regulation of other high-risk foods¹³ that are allowed to be sold, reflecting New Zealand's risk-based approach to regulation and commitment to consumer choice.

Decision criteria 3: certainty

68. Two issues need to be considered in terms of certainty: the rules and the likelihood of compliance (either voluntary or enforced). Under prohibition, the rules would be clear compared with the current situation because only pasteurised raw milk would be able to be sold. Prohibition would be easy for compliance officers to interpret. However, as noted above, illegal sales would almost certainly still occur and would require considerable resources to enforce.

Option 1: Farm sales with limits on the quantity sold and purchased

69. The main features of option 1 are:
- sales and collection must only be from the dairy farm direct to consumers;
 - restrictions on the amount a dairy farmer could sell each day (40 litres or less per day) and the amount a consumer could purchase (6 litres or less per day);
 - some production and food safety measures would apply, but other measures would not be required, such as verification checks, pathogen testing, veterinary visits and milk harvesting.

¹³ An exception is a list of prohibited toxic plants and fungi in Standard 1.4.4 of the Australia New Zealand Food Standards Code (the Code). Also kava is prohibited as an ingredient in food in Standard 2.6.3 of the Code.

Decision criteria 1: food safety

70. The main advantage of option 1 would be a reduction in foodborne illness compared with the current situation because fewer people would be able to buy raw milk and therefore fewer people would potentially get sick. This would reduce healthcare costs and protect New Zealand's reputation for safe food.
71. Despite the above, illnesses would still occur because:
- raw milk may contain pathogens that can cause illness;
 - food safety risks would exist due to the lack of refrigeration when consumers transport raw milk from the farm to the home;
 - a lack of verification checks and other production and food safety measures would exacerbate the risks to public health;
 - some consumers would likely circumvent the law or act illegally because of the severity of the restrictions.

Decision criteria 2: consumer purchase of raw milk

72. This option would provide consumers with limited choice, compared with the reference point, and would not maintain their existing ability to access raw milk. It is unlikely to provide access to enough raw milk for those consumers who wish to make cheese at home. If consumers do not pre-order their raw milk, they could travel to the farm only to discover that the dairy farmer has already sold their limit for the day.
73. Operators who are selling more than 40 litres per day or who are currently selling from places other than the farm would have to close or modify their operations. Some may act illegally due to the restrictions and the known demand for raw milk.

Decision criteria 3: certainty

74. Option 1 would provide greater legal certainty and offence provisions compared with the current situation.
75. The likelihood of voluntary compliance is greater than under prohibition. However, given the demand for raw milk, there may be difficulties in ensuring full compliance, for example, that registered farmers were only selling the limited amounts allowed (40 litres or less per day) and consumers were only purchasing the limited amounts permissible (6 litres or less per day).

Option 2: Farm sales with no limits on the quantity sold and purchased

76. The main features of option 2 are:
- sales and collection would only be from the dairy farm direct to consumers;
 - there would be no limits on the quantity sold or purchased;
 - all farmers would follow strict production and safety requirements, but those selling 40 litres or less per day would be exempt from certain requirements (the same as for option 1).

Decision criteria 1: food safety

77. This option would likely reduce the incidence of foodborne illness compared with the current situation. This is because there would be reduced accessibility to consumers and stricter production and food safety requirements for farmers selling more than 40 litres per day. Also, an underground market is likely to occur due to consumer demand and the limited choice for urban consumers. A level of ongoing illness would continue.

Decision criteria 2: consumer purchase of raw milk

78. Consumers of raw milk would be able to purchase the quantity of milk they desire, including amounts needed to make raw milk cheeses. However, as with option 1, it would provide more limited choice for consumers than the current situation, particularly for those from urban areas.

Decision criteria 3: certainty

79. The rules have a greater level of certainty than the current situation.
80. The likelihood of voluntary compliance is a greater than under prohibition or option 1. However, given the demand for raw milk, there may be difficulties ensuring full compliance, for example, that registered farmers were only selling the limited amounts allowed (40 litres or less per day) or meeting higher food safety requirements, and consumers were only collecting milk from the farm.

Option 3: Farm sales and home deliveries with no limits on the quantity sold and purchased and with production and food safety exemptions for lower quantities sold

81. The main features of option 3 are:
- sales would only be from the dairy farm direct to consumers with no limits on the quantity sold or purchased but with production and food safety exemptions for farmers selling lower quantities (40 litres or less per day). Collection would be:
 - from the dairy farm; or
 - via home deliveries by the dairy farmer, provided:
 - the dairy farmer sells, in total, 40 litres or more per day;
 - the purchaser pre-orders and pays;
 - delivery is to the purchaser's residence; and
 - additional food safety requirements are met for packaging, transport and delivery.

Decision criteria 1: food safety

82. The incidence of illness associated with the consumption of raw milk could either decrease or increase, compared with the current situation, depending on:
- the extent to which sales increase or decrease;
 - how well raw milk is handled when delivered to the home and the consumer is absent;
 - the impact of strict production, food safety and labelling requirements; and
 - the extent to which suppliers can meet the production and safety requirements.

Decision criteria 2: consumer purchase of raw milk

83. Option 3 would support consumers in both urban and rural communities who want continued access to raw milk and offers a similar amount of choice to the current situation. It allows continued transfer of raw milk at places other than the farm (albeit via a different method) and the purchase of quantities needed to make raw milk cheeses.

Decision criteria 3: certainty

84. This option would allow greater certainty for buyers and sellers compared with the current situation because the legislation would be clear and would include offence provisions.
85. Option 3 would likely have higher levels of voluntary compliance compared with prohibition and options 1 and 2. There is a risk of illegal activity (for example, de facto collection points), and compliance enforcement to prevent this would be onerous.

Option 4: Farm sales and home deliveries with no limits on the quantity sold or purchased and no production and food safety exemptions for lower quantities sold

86. Option 4 is similar to option 3, with the exception that all farmers, irrespective of the number of litres sold per day, would have to meet food safety requirements. There would be no exemptions for farmers wanting to sell small amounts of raw milk to supplement their income.
87. The rationale behind this option is that balancing the management of risks to public health with consumer choice is best achieved through fewer and larger businesses meeting higher requirements.

Decision criteria 1: food safety

88. The incidence of illness would be less than option 3, given that there would be no production and food safety exemptions for farmers selling small quantities of raw milk. As with option 3, the actual incidence of illness compared with the current situation would depend on the extent to which sales increase or decrease, how well raw milk is handled when delivered to the home and the consumer is absent, the impact of strict production, food safety and labelling requirements, and the extent to which suppliers can meet the production and safety requirements.

Decision criteria 2: consumer purchase of raw milk

89. Option 4 would support consumers in both urban and rural communities who want continued access to raw milk and offers greater choice than options 1 and 2. It also allows some continued transfer of raw milk at places other than the farm. It provides a similar level of access as the current situation (albeit via a different method).
90. Consumers of raw milk would be able to purchase the quantity of milk they require, including amounts needed to make raw milk cheeses.

Decision criteria 3: certainty

91. This option would allow for greater certainty for buyers and sellers compared with the current situation, because the legislation would be clear and would include offence provisions.
92. The likelihood of compliance would be greater than prohibition and options 1 and 2. There would be a risk of small suppliers continuing to supply without meeting higher standards (illegally) and of de facto collection points. Compliance enforcement to prevent this would be onerous.

Option 5: Farm sales and collection points with no limits on quantities sold or purchased

93. The main features under this option are:
- sales would be permitted from the dairy farm direct to consumers with no limits on the quantity sold or purchased and collection was either:
 - i. from the dairy farm; or
 - ii. via collection points¹⁴ (but excluding home deliveries) provided:
 - the dairy farmer sells, in total, 40 litres or more per day;
 - the purchaser pre-orders and pays;
 - additional food safety requirements are met for transport, packaging, delivery and operation of the collection point.

¹⁴ A collection point is an informal term and does not have a legal definition. It is currently used to include a range of vending arrangements, including via health food stores, farmers' markets and raw milk clubs (where one person collects the milk from the farm for others to pick up).

Decision criteria 1: food safety

94. Some farmers are currently delivering raw milk via collection points while others may not be using collection points due to their legally ambiguous status. If option 5 were lawful, more farmers would likely employ this method of delivery, given its financial attractiveness. Expansion of this market would likely result in greater sales and consumption and a corresponding increase in the incidence of illness compared with the current situation and other options.
95. Controls around production, transport, point of delivery and labelling would not be sufficient to offset the predicted increase in consumption and incidence of illness.

Decision criteria 2: consumer purchase of raw milk

96. This option would provide consumers (particularly urban consumers) with greater choice compared with the current situation (for the reasons given above).

Decision criteria 3: certainty

97. While certainty would be greater than in the current situation, it would be less than that in the other options because it would be difficult to regulate collection points in such a way that:
 - clearly distinguishes them from general retail outlets. Collection points could easily result in a model similar to retail sales where large numbers of consumers could “window shop”. Farmers are already travelling long distances to sell raw milk in our largest cities and this is likely to increase if this scenario were adopted;
 - does not arbitrarily restrict sales to one type of retail outlet to the detriment of others.
98. Assessing the level of voluntary compliance would be difficult (because of difficulty in making the rules clear).

The reference point – retail and food service sales

99. The main features of the reference point are set out in paragraph 11.

Decision criteria 1: food safety

100. The incidence of illness would increase compared with the current situation, all other options and prohibition. This would be due to the widespread availability of raw milk increasing consumption levels, and the absence of any production and food safety controls specific to raw milk, which would increase the potential for pathogens to occur in raw milk.

Decision criteria 2: consumer purchase of raw milk

101. Under this scenario, urban and rural consumers would have the maximum level of choice about whether to consume raw milk because it would be freely available from any general retail or food service outlet (for example, supermarkets, organic produce shops, cafes, restaurants, boarding schools and rest homes).

Decision criteria 3: certainty

102. In terms of sales, there would be certainty for consumers and farmers because there would be no restrictions on the point-of-purchase or the quantities sold and purchased.
103. Although no specific production and food safety controls would apply in legislation, limits on the number of pathogens that would be permitted in raw milk would still apply. Farmers would lack government assistance, including scientific evidence, on the

controls that would best manage the risks and ensure pathogen numbers are below the limits, so these would be relatively difficult to comply with.

104. Overall, however, levels of voluntary compliance are likely to be high (because of lack of restrictions) and the need for enforcement would be less.

Consultation

105. In October 2011, MPI sought public input on options that continued to restrict sales of raw milk by allowing them only from the farm and in limited quantities. This consultation resulted in 1,685 submissions, with most consumers and farmers who sold raw milk strongly supporting the continuation of sales, sales in places other than the farm, and collection of milk by people other than the consumer. The then Minister for Food Safety required further work to be undertaken, including scientific work.
106. MPI most recently consulted with stakeholders on raw milk sales over a six-week period from May to July 2014. The consultation paper proposed options 1, 2 and 3 discussed above.¹⁵ Prohibition was discussed in the paper but was excluded as an option. The Government did not support prohibition before the consultation in 2014.
107. The paper was posted on the MPI website, sent to all those who provided submissions on the 2011 raw milk consultation, and was provided as a link in a media statement that announced the paper's release. Submissions were received via post, email and through an online template.
108. MPI received 1585 submissions from stakeholders in 2014. The approximate distribution of submissions by sector is as follows:
 - dairy farmers: 4 percent;
 - raw milk consumers: 94 percent;
 - dairy processors and food industry stakeholders: 0.5 percent;
 - public health, medical and veterinary bodies: 1.5 percent.
109. MPI also consulted with other government agencies, including the Ministry of Health, Ministry of Foreign Affairs and Trade, Ministry of Business, Innovation and Employment, the Treasury, New Zealand Trade and Enterprise and Te Puni Kōkiri. The Department of the Prime Minister and Cabinet was informed. The Australian Department of Health and Food Standards Australia New Zealand were also consulted on specific issues.
110. During the consultation, consumers and suppliers of raw milk were also encouraged to participate in an anonymous web-based survey that examined respondents' understanding of, attitudes to and behaviours regarding raw milk. This resulted in 2,670 completed surveys. The Raw Milk Producers' Association informed MPI that many respondents thought that their completed survey was a submission.

Submitter comments on the proposed options

111. The great majority of consumers did not support any of the proposed options. They considered them impractical, particularly for urban consumers, and likely to stop sales. The proposed options were also seen as inappropriate because the risks and illnesses were thought to be overstated and the benefits understated, especially when compared with illnesses resulting from nutrient-poor diets. Furthermore, submitters strongly believed that consumers have a right to choose what they eat.
112. Many consumers noted that substantial improvements have occurred in animal health and hygiene since pasteurisation was introduced. Some people also believed the drive to restrict sales is motivated by restriction of competition in the dairy sector.
113. Suppliers argued that the options were based on studies of "factory" milk (raw milk intended for pasteurisation). They considered the options inappropriate on the basis that drinking "factory" milk is a significantly greater risk than drinking raw milk produced

¹⁵ *The sale of raw milk to consumers* (MPI Public Discussion Paper No: 2014/22).

for consumption. Like consumers, they stated there was little evidence of raw milk being the cause of illness and that the options would reduce consumer choice.

114. Suppliers noted that the requirement to keep records of sales was unfeasible as people are unlikely to provide their contact details. They also pointed out that records cannot be kept via vending machines and self-fill vats. They supported traceability via suppliers' databases, which they estimated to include 95 percent of customers.
115. In contrast, dairy processor, food industry stakeholders and public health groups considered pasteurisation the most appropriate method to manage the food safety risks associated with raw milk. Public health groups pointed out that the options do not adequately address the risks at critical control points (for example, storing and transporting raw milk and sterilisation of milk collection containers). They were also concerned the options were uneconomic and likely to result in high compliance costs.
116. Dairy processors argued that no option would decrease foodborne illness, and there would therefore be a cost to public health and a risk to New Zealand's international reputation as a safe supplier of food.

Ministry for Primary Industries analysis

117. To allow sales to continue and meet the objectives, certain production, food safety and labelling requirements must be imposed. These measures alone will not, however, sufficiently protect public health because raw milk may contain pathogens and has caused severe illnesses. Restrictions on the point-of-sale and/or volumes sold must also be considered, whether or not they are inconvenient for consumers. This means some suppliers will have to cease or change their operations. These restrictions may also make it relatively more difficult for urban consumers to access raw milk. MPI has pointed out many times, including during the consultations in 2011 and 2014, that some suppliers, particularly those selling raw milk via collection points, are doing so outside of the original intent of the law and that raw milk is a high-risk food.
118. MPI's scientific risk assessment of raw milk and the literature review on the benefits of raw milk compared with pasteurised milk are consistent with other international assessments. MPI does not, therefore, agree that the risks are overstated or the benefits understated. Furthermore, MPI does not consider it appropriate to compare morbidity and mortality rates related to nutrient deficiencies against the consumption of raw milk. The former relates to the total diet and manifests as illness over many years, whereas the latter is a single food that can be immediately life threatening, particularly for infants and young children. Also, processes such as pasteurisation can easily remedy the food safety issues relating to raw milk.
119. Given the risks to public health, MPI considers the preferred approach should provide a restricted level of choice.
120. MPI agrees that substantial improvements have occurred in animal health and hygiene since pasteurisation was introduced. It also agrees that the MPI risk assessment was based on "factory milk" rather than milk produced specifically for drinking. Nevertheless, domestic and international outbreaks of foodborne illness have implicated raw milk from dairy farms specialising in the production of raw milk for direct human consumption only. A cautious approach to the sale of raw drinking milk is therefore needed.
121. MPI disagrees with the view that there is little evidence of raw drinking milk being the cause of illness. The presence of the most dangerous human pathogens in raw milk is well documented. Morbidity and mortality cases exist with proven strong links to raw

milk consumption, including the death of a three-year-old child in Melbourne in December 2014.

122. MPI intends to consult further on record-keeping and food safety measures once the policy for the sale of raw milk to consumers has been determined.
123. A discussion of the submissions received on each of the policy options consulted on, and MPI's analysis of those submissions, is attached as Appendix II.

Conclusions and recommendations

124. This RIS analyses several options and scenarios against three decision criteria (food safety, consumer purchase of raw milk and certainty) that reflect the objectives. These objectives are to manage risks to public health, maintain confidence in New Zealand's food safety regime and provide certainty for consumers and producers of raw milk, while recognising the strong demand from consumers, both rural and urban, to be able to continue to actively seek out and consume raw milk.
125. The reference point, that is, retail sales, would allow for the maximum level of consumer choice, but the number of people who could access and consume raw milk would present too great a risk to food safety.
- The RIS analyses five options and two scenarios (prohibition and the reference point) against the decision criteria: option 1 – *farm sales with limits* on the quantity sold and purchased
 - option 2 – *farm sales with no limits* on the quantity sold and purchased
 - option 3 – *farm sales and home deliveries with no limits* on the quantity sold or purchased and *with production and food safety exemptions* for lower quantities sold;
 - option 4 – *farm sales and home deliveries with no limits* on the quantity sold or purchased and *no production and food safety exemptions* for lower quantities sold;
 - option 5 – *farm sales and collection points* with no limits on the quantity sold or purchased;
 - prohibition
 - reference point.
126. All options and prohibition would result in fewer illnesses compared with the current situation, but access to raw milk would be more limited. The reference point and prohibition provide the most certainty for buyers and sellers.
127. Prohibition offers no choice. While it would almost certainly reduce the incidence of illnesses compared with the current situation, overseas experience demonstrates that illegal sales almost certainly occur as well as activities that circumvent the law. (The risk of illness proportional to the amount of raw milk consumed is also likely to be higher, without regulated control measures.)
128. Options 1 to 4 are variants of farm gate sales, with option 1 being the most restrictive and options 3 and 4 being the most liberal. Options 1 and 2 would almost certainly reduce illnesses associated with drinking raw milk (although illnesses would still occur) compared with the current situation. However, options 1 and 2 would respectively provide no, or very limited, choice for consumers.
129. Options 3 and 4 would support consumers in urban and rural communities who are actively seeking out raw milk and are informed about the risks. In options 3 and 4, there is a risk the home delivery component could increase the likelihood of illness compared with the current situation, although this would be mitigated as much as possible by enhanced production and food safety requirements. Option 3 does not exempt farmers from any requirements so the impact on the incidence of illness would be less than option 4.
130. Option 5 is more liberal than options 1 to 4 because it allows wider access through deliveries to collection points. However, it is problematic because defining a collection point in a way that does not result in retail sales would be difficult. An increase in sales and resulting consumption would likely increase the incidence of illnesses.

131. MPI is not expressing a preferred option in this analysis. It notes that the food safety risks increase the further one moves from prohibition to retail sales, while the level of consumer choice decreases as one moves from retail sales to prohibition. The option chosen by the Government must reflect its preferred balance between these two objectives.

Implementation Plan

132. Regardless of the option chosen, MPI will take the following steps to give effect to the policy for raw milk sales:
- the Minister for Food Safety will make a media statement announcing the Government's decisions;
 - MPI will communicate the decisions to all those who made submissions on the discussion paper in 2014;
 - new regulations and specifications will be introduced under the Food Act 2014 and the Animal Products Act 1999 (following targeted consultation with stakeholders). At the same time, the current provisions governing raw milk in the Food Act 1981 will be repealed when the Food Act 2014 comes into force;
 - transitional arrangements will be developed. While new suppliers will likely have to register and meet all new requirements by 1 March 2016, existing operators may be given a longer time in which to transition;
 - MPI will post the new regulatory information on its website, along with guidance;
 - MPI may hold separate workshops for dairy farmers and verifiers to provide guidance and training respectively on the new regulations. If workshops are held, the number will depend on the availability of staff, budgetary considerations and where farmers are situated;
 - MPI will also provide ongoing information about raw milk to consumers and how to mitigate the risks associated with its consumption.
133. One of the risks around implementation is that MPI does not know who the suppliers of raw milk are, as no one is currently registered with MPI for that purpose. This risk will be mitigated by requiring people to notify MPI within a set time (for example, a month) that they are supplying raw milk. The list of suppliers who notify MPI within this timeframe will be the list of existing players. After that, everyone else would be regarded as "new" suppliers. MPI is mindful that raw milk is a high-risk food, and that the sooner all suppliers are included in the new regime, the greater the reduction in the risk of serious foodborne illness.
134. Implementation costs will be met within existing MPI baselines.
135. MPI will undertake several activities to ensure that farmers are complying with the new safety requirements. These will include:
- verification (when required under an option) by a recognised agency;¹⁶
 - monitoring of raw milk for pathogens (when required under an option) and hygiene indicators to confirm that industry controls and practices are minimising the associated risks;
 - audits of the overall regulatory system for raw milk against the outcomes sought (for all options).

¹⁶ Verification of a raw milk producer is expected to focus on animal health, milk harvesting and cooling, operator competency and hygiene measures on the farm.

Monitoring, evaluation and review

136. Independent verifiers (when required under an option) will ensure that dairy farmers supplying raw milk are complying with the new regulations and specifications. When issues arise, verifiers will educate, remind farmers of their obligations and reassess within a specified period. If issues are not resolved, MPI will use a range of tools, such as warnings, directions, seizures and suspension of operations to ensure compliance. Enforced compliance via prosecution can be undertaken when no other measure has sufficed.
137. MPI will continue to keep records of complaints and investigations, follow media-related articles and liaise with representative bodies such as Federated Farmers, the Raw Milk Producers' Association, district health boards and consumer-related groups. MPI will monitor sales because farmers will be required to keep records. It will also monitor the results of microbiological tests (when required under an option), which farmers will be required to undertake on a regular basis. Depending on the need, MPI may also survey farmers to better understand their issues, knowledge and behaviours. The combined information will enable MPI to keep informed on the market and understand the factors that may be contributing to outbreaks of illness or otherwise.
138. MPI will review the raw milk regime after its implementation to assess how effectively the legislative changes are working.

Appendix 1: Cost benefit analysis of options and scenarios for regulating sale of raw milk to consumers

Introduction

The information available to calculate the costs and benefits of the different options and scenarios for regulating raw milk is limited. Some information exists that can be used to estimate the current quantity consumed, price and health impacts. Beyond this, assumptions must be made to estimate the costs and benefits under the reference point (retail sales), prohibition and the proposed options.

The direction of change of consumption, price and health under the reference point (retail sales), prohibition and options, compared with the current situation, can be predicted. The ordering of the options against public health and consumer choice criteria can also be predicted, although with less accuracy.

Because of these limitations, the cost benefit analysis (CBA) estimates the reference point (retail sales) based on information about current activity and compares this with assumed changes under the most restrictive scenario – prohibition.

This gives an indicative range of the costs and benefits spectrum. It provides an “order of magnitude” estimate of what is at stake. All of the options considered in the Regulatory Impact Statement (RIS) will fall within this range. (Their exact location cannot be predicted with sufficient certainty to justify this task.)

Summary of quantities estimated

The following quantities are estimated:

- public health costs;
- taxation loss (from worker illness);
- cost of government compliance activity;
- consumer surplus (benefit).

For some quantities, insufficient information exists to allow an estimation. These are:

- changes in New Zealand’s food safety reputation;
- losses for suppliers who exit the market.

Some of the costs and benefits to suppliers and consumers can be internalised – that is, factored into decisions on the quantity supplied and price charged, or the amount demanded. These costs are noted below but are excluded from the rest of the CBA analysis. They include:

- private health costs and benefits;
- compliance costs that are borne by suppliers and passed on in the price.

Summary of costs and benefits

The estimates above are summarised in Table 1, along with a description of the unquantified costs and benefits. (The latter are included as a reminder that not all of the costs and benefits have been quantified.)

Table 1: Summary of the indicative range of costs and benefits for prohibition compared with the reference point (retail sales) and current situation

	Prohibition	Current	Reference point (retail sales/no controls)
Quantified			
Public health (cost) (attachment 2)	\$260,000 - \$560,000	\$1,000,000 - \$2,200,000	\$1,600,000 - \$3,600,000
Taxation loss due to illness (cost) (attachment 3)	\$29,000 - \$63,000	\$120,000 - \$251,000	\$180,000 - \$380,000
Consumer surplus (benefit) (attachment 4)	\$440,000 - \$730,000	\$1,800,000 - \$2,900,000	\$2,600,000 - \$4,400,000
Compliance activity (cost)	\$290,000 - \$550,000	\$290,000 - \$550,000	Undetermined
Unquantified			
Risk to New Zealand food safety reputation	Low	Medium	High
Loss to suppliers who exit market	Unknown	Nil	Unknown

Note: All values are in New Zealand dollars per year and rounded to two significant figures.

Calculation of costs and benefits

Quantity consumed estimates (attachment 1)

All of the estimations of cost and benefits of the options require an estimate of the quantity of raw milk consumed.

Results of a survey conducted by the Ministry for Primary Industries (MPI) in 2014 have been used to estimate current consumption of raw milk of 1 040 000 litres per year (see attachment 1).

The CBA *assumes* that the quantity under prohibition would reduce by 75 percent to 260 000 litres. This is based on anecdotal knowledge, reinforced by submissions that a subset of suppliers and consumers exists who are strongly committed to consumption of raw milk and would view prohibition as an unreasonable imposition. The majority of suppliers and consumers are assumed to comply with the law.

The CBA further *assumes* that consumption would increase under the reference point (retail sales) scenario by 50 percent because of greater ease of access than currently exists, resulting in 1,560,000 litres per year being consumed.

We estimate that the quantity consumed would be:

- 260,000 litres per year under prohibition;
- 1,560,000 litres per year under the reference point (retail sales).

Public health costs (attachment 2)

Raw milk consumption is associated with a range of illnesses, the incidence of which positively correlates with consumption levels.

These illnesses generate public health costs (for example, the government-borne costs of hospital expenses, doctors visits, medicines, sickness benefits and so on). They also generate

private health costs, but it is assumed these are factored in when consumers decide whether and how much raw milk to consume.¹⁷

We have estimates of current levels of different types of illness and the medical costs associated with these. These estimates are given as ranges, because not all reported illnesses where raw milk is given as a risk factor are actually caused by it. We estimate the actual number to fall between 35 percent and 75 percent of the reported number. The estimates have been further scaled to reflect the different levels of consumption assumed under the different scenarios and generate the following estimates.

We estimate that the cost to the public health system would be:

- \$250,000 - \$550,000 per year under prohibition;
- \$1,500,000 - \$3,300,000 per year under the reference point (retail sales).

Taxation losses from illness (attachment 3)

Worker productivity will vary, in line with the level of illness. This will be associated with changes in government tax revenue.

It is assumed workers are paid the value of what they produce. If they are not at work, the company loses this output, and the government loses the tax that would have been paid on that output. (It is assumed workers take sick leave, so their income and income tax remain unchanged.)

Again, we have given an estimate for this as a range because it is uncertain how many of the reported illnesses where raw milk was given as a risk factor were actually caused by raw milk.

We estimate that the loss in company tax collected by the Government due to illness would be between:

- \$29,000 and \$61,000 per year under prohibition;
- \$129,000 and \$275,000 per year under the reference point (retail sales).

Cost of government compliance activity

A regime to ensure food is “safe” involves work to specify what “safe” production and distribution processes look like, and verification checks to ensure they are being followed. These costs are borne by suppliers (under a costs recovery regime) and it is assumed they are factored into the price for raw milk.

The Government, however, retains the costs of following up on reports of non-compliance and associated enforcement activities. MPI has estimated the labour costs of enforcing the options to be between 2.4 and 4.6 full-time equivalents (FTEs), for all the options and prohibition.¹⁸ This is estimated to equate to between \$288,000 and \$552,000 per year.

Change in consumer surplus (attachment 4)

Changes in the amount of raw milk consumed will result in a change in the consumer surplus. The consumer surplus is a “bonus benefit” that reflects the difference between the price

¹⁷ The correlation between illness and consumption of raw milk has been demonstrated by scientific research. The research has found increased risk of illness and no conclusive health benefits. These research findings are followed in the calculations of health costs to government. The positive correlation between illness and raw milk consumption is, however, disputed by consumers. Many argued in their submissions that there are health benefits from drinking raw milk and minimal or no health risks.

¹⁸ One compliance FTE is estimated to cost \$120 000 including overheads. Note that the costs under the reference point (retail sales) are undetermined as, for reasons explained in the RIS, it is unclear how compliance would be carried out without new regulations.

consumers would have been prepared to pay for the milk compared with what they actually paid.

The consumer surplus has been calculated on the basis of current estimates of price, quantity consumed, and the price elasticity of demand for pasteurised milk (which is used as a reference).

The current price is estimated at \$2.50 per litre based on a review of raw milk offered for sale on websites. The supply curve is assumed to be flat and not to move between the different options. The demand curve is assumed to be more elastic than for pasteurised milk under the reference point (retail sales), but less elastic than for pasteurised milk under prohibition (on the basis that only a small subgroup of determined consumers remains).

Current consumption is estimated, as noted earlier, to be 1,040,000 litres per year, to move to 1,560,000 litres per year under the reference point (retail sales), and then fall back to 260,000 litres per year under prohibition. We estimate that the consumer surplus (scaled at plus or minus 25 percent to allow for uncertainty in the quantity estimate) would be between:

- \$440,000 and \$730,000 per year under prohibition;
- \$2,600,000 and \$4,400,000 per year under the reference point (retail sales).

Benefits associated with improvement in New Zealand's food safety reputation

The possibility exists that the sale of raw milk and associated illness may have a negative impact on the good reputation of New Zealand's food safety system. The risk is associated with the strictness of the regime for sale of raw milk and the health outcomes that result. This could have negative spill-overs for other New Zealand food producers, where demand for their products relies on this reputation. This point has been raised in submissions and is of particular concern in international markets (where alternative products are easily available).

As the options considered restrict the sale of raw milk, compared with the reference point (retail sales), there is a possibility of reputational benefits from these options.

We do not have sufficient information to attempt to quantify this effect, so the possibility is acknowledged, but not estimated.

The risk to New Zealand's reputation will be lowest under prohibition and highest under the reference point (retail sales).

Losses for suppliers who exit the market

Some options may result in suppliers exiting the market for raw milk, for example, small suppliers who cannot remain viable once a compliance safety regime is fully implemented. Some of these suppliers may lose the value of fixed assets they have purchased to support their supply of raw milk if they cannot resell those assets. It is possible that some suppliers will exit under retail sales (as increased sales volumes will tend to favour larger players). Suppliers will also exit under prohibition (as they would not want to break the law). While acknowledging this, we do not have sufficient information on how many suppliers would be in this category to estimate this cost with any certainty.

Future monitoring

The introduction of a new policy and subsequent regulations provides the opportunity to consider what information could be collected in the future to allow for a review evaluating the effects of the policy.

Monitoring compliance with safety requirements

The review would involve monitoring compliance with the requirements of the regulated control scheme (RCS) – the set of production and distribution controls aimed at improving food safety. MPI undertakes different activities to check that businesses are complying. These include:

- verification by a recognised agency (verification of a raw milk producer is expected to focus on animal health, milk cooling, operator competency and hygiene measures on farm);
- monitoring of raw milk for pathogens and hygiene indicators to confirm that industry controls and practices are minimising the associated risks;
- audits of the overall regulatory system for raw milk (against the outcomes sought);
- following up on reports of non-compliance and undertaking enforcement activities associated with these.

Monitoring sales

The regulatory regime will require records of sales to be kept. MPI will consider how it can access this data, because it would allow a range of calculations (for example, total quantity, quantity by supplier, distribution and average volume of sales).

We propose asking suppliers when they register an RCS for the sale of raw milk whether they are also operating under a risk management programme (because, from this, we could deduce whether they are selling only raw milk direct to consumers or also selling raw milk to be pasteurised).

Other information of interest will depend on the option chosen. For example, if off-farm sales are allowed, it would be useful to monitor how much is collected from both the farm and off-farm.

Collecting information on price may not be possible through records of sale (due to commercial sensitivity). Other methods are possible, however, including analysis of website information and voluntary surveys of suppliers.

Monitoring health

MPI will continue to monitor outbreaks of foodborne illness associated with consuming raw milk, as recorded in EpiSurv, the public health surveillance database maintained by the Institute of Environmental Science and Research. Reporting from EpiSurv to MPI will occur more regularly than at present (that is, several times annually).

Work is being undertaken to improve the collection of information in EpiSurv to capture more notifiable diseases where the patient has consumed raw milk. For example, improvements are being made to the data collection questionnaire, and health officers will undertake further training in the collection of this information.

Conclusion

Limited information is available to calculate the costs and benefits of the different options for regulating raw milk. The CBA has used current estimates of quantity consumed, price and health impacts, and a considerable number of assumptions to estimate:

- public health costs;
- taxation loss (from worker illness);
- cost of government compliance activity;
- consumer surplus (benefit).

These quantities have been estimated for the current situation, prohibition and a reference point (retail sales) where specific regulations lapse and general retail sales result.

This gives an indicative range of the costs and benefits within which all the options can be assumed to fit.

These estimates provide an “order of magnitude” estimate of what is at stake, based on the information that is available. They are not forecasts. This caution is reinforced by the fact that some costs could not be estimated at all.

The more restrictive the option the lower the quantity consumed and the greater the loss of consumer benefit. Offsetting this are the reduced costs of public health, reduced taxation loss due to illness and lower risk to New Zealand’s reputation.

This analysis provides a basis for determining what monitoring should occur in future to evaluate the effects of the policy option chosen.

ATTACHMENT 1: QUANTITY CONSUMED ESTIMATES

All of the estimates of costs and benefits below require an estimate of the quantity of raw milk consumed.

Results of a survey conducted by MPI in 2014 have been used to estimate current consumption of raw milk at 20,000 litres per week. The survey was conducted in parallel with the consultation on the policy options. A link to the survey was provided on the submissions webpage. The survey was anonymous and collected information on respondents' experiences of buying, selling or drinking raw milk.

MPI's estimate of the current quantity of raw milk being consumed is based on the results to question 33 ("And on average, how much raw milk would you sell each week?"). Sixty-seven people responded to this question. The Raw Milk Producers' Association has 54 members and estimates at least double that number of non-members sell raw milk, so MPI assumed 108 sellers in total.

We believe a good representation of the market completed the survey because, given the contentious nature of the issue, large producers would have wanted to have their say. We consider that producers who did not fill out the survey would be small enough to be covered by the scaling-up of our estimate.

Results

Volume (litres)	Number of sellers
Less than 20	26
21-40	13
41-100	6
101-300	3
301-1000	13
1,000 plus	6
Total	67

Multiplying the top of the range by the number of sellers in that range for all ranges (except the 301 to 1,000 range where we used the midpoint (650), and the 1,000-plus range, where we used the bottom of the range (1,000)) gives an estimate of 17,000 litres sold per week. We have rounded this up to 20,000 to take into account sellers who did not complete the survey and sellers who are selling significantly more than 1,000 litres per week. This generates an estimate for current consumption of 1,040,000 litres per year.

The CBA *assumes* that consumption would increase under the reference point (retail sales) scenario by 50 percent (because of greater ease of access than exists at present) resulting in 30,000 litres per week being consumed, or 1,560,000 litres per year.

It is further *assumed* that the quantity under prohibition would reduce by 75 percent, to 5,000 litres per week or 260,000 litres per year. This is based on anecdotal knowledge, reinforced by submissions, that a subset of suppliers and consumers exists who are strongly committed to the consumption of raw milk, and who would view prohibition as an unreasonable imposition. The majority of suppliers and consumers are assumed to comply with the law.

ATTACHMENT 2: PUBLIC HEALTH COSTS

Consuming raw milk can cause severe illness due to the possible presence of harmful micro-organisms such as Shiga toxin-producing pathogenic *Escherichia coli* (*E. coli*) O157 (STEC) and *Campylobacter* spp. While raw milk can also contain other harmful micro-organisms, MPI has focused on these two because illnesses caused by STEC bacteria are severe (often leading to hospitalisation) and campylobacteriosis is the most common illness caused by raw milk.

The economic costs associated with illnesses caused by raw milk consumption include costs to the public health system and lost worker productivity. (Private health costs are assumed to be internalised by consumers in their decisions on how much raw milk to consume, as noted earlier.)

The positive correlation between illness and consumption of raw milk has been demonstrated by scientific research. These costs will decrease under each of the options, compared with the reference point (retail sales), because the amount of milk consumed will be less.

Notifiable and non-notifiable diseases

Notifiable diseases are set out in Schedules 1 and 2 of the Health Act 1956. Under the Act, attending medical practitioners are required to notify their local medical officer of health of any notifiable disease they suspect or diagnose. Disease notifications are recorded in EpiSurv. EpiSurv provides data on the number of notified diseases with raw drinking milk as a risk factor.

Not all notifiable diseases are notified, however, so a multiplier (from the literature) has been used to estimate the actual number of notifiable cases of disease.

A non-notifiable disease is not required by law to be reported to government authorities. These include some viral infections such as norovirus. MPI has no data on non-notifiable diseases associated with the consumption of raw milk. Such diseases are, however, likely to be less severe (which is an important reason why they are non-notifiable), and no attempt is made to estimate their impact in this analysis.

EpiSurv data

EpiSurv data for 2014 shows 165 cases of notifiable disease where raw drinking milk was a risk factor, excluding STEC. The number of notified STEC infections was 20. These STEC infections led to five hospitalisations and one case of hemolytic uremic syndrome (HUS).

By reviewing the literature and from talking to an expert familiar with the EpiSurv data, we estimate that 35 percent to 75 percent of these notified illnesses where raw milk was a *risk factor* were actually *caused* by raw milk consumption. (Health officers usually report the food they suspect most, rather than all food eaten. The other cases are assumed to be contracted by other means such as being exposed to an organism through contact with animals or contaminated water. Other risk factors are often present along with raw milk.)

Institute of Environmental Science and Research multiplier

The multiplier used by Cressey and Lake (2014) of non-reported to reported campylobacteriosis cases (which make up 85 percent of the notified illnesses that are not STEC) is 9.5. MPI uses this multiplier for all illnesses other than STEC. The multiplier that Cressey and Lake estimate for STEC illnesses is 18.4.

Using these multipliers would give an estimate of 1,568 for illnesses excluding STEC. Scaling this by 35-75 percent gives 549-1,176. The figure for STEC infections would be 368, or 129-276 after scaling.

The estimated total figure for illnesses is therefore 678-1,452.

Costs to public health system in 2014 (current)

Gadiel and Abelson (2010, p 22) provide an estimate of the unit treatment costs for foodborne illness. These estimates have been converted to 2014 dollars giving unit costs of \$58 for campylobacteriosis and \$7,888 for STEC. (Campylobacteriosis is used as a proxy for illness excluding STEC, given that it makes up 85 percent of these illnesses.)

Multiplying these unit costs by the estimated range of cases gives an indicative total cost range for foodborne illness. These are set out in Table 2.

Table 2: Summary of illness costs associated with consumption of raw milk (EpiSurv 2014)

	Notified	Estimated notified and non-notified "notifiable diseases"	Scaled estimate (35% - 75%)	Unit treatment costs per case	Total treatment costs
Excl STEC	165	1,568	549-1,176	\$58	\$31,842 - \$68,208
STEC	20	368	129-276	\$7,888	\$1,017,552 - \$2,177,088
Total	185	1,936	678-1,452		\$1,049,394 - \$2,245,296

Note: STEC = Shiga toxin-producing pathogenic *Escherichia coli* (*E. coli*).

ATTACHMENT 3: TAXATION LOSSES FROM ILLNESS

Current (2014)

Summary

Estimate	\$120,000 – \$250,000
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Explanation

Worker days lost

Assuming that workers are paid the value of the output they produce, that is, the income that they generate for their company, when a worker is off work, the company loses that value of income and the Government loses the tax from that income. Of the 678 to 1452 estimated illnesses in 2014, 19 lead to hospitalisations (five STEC, one being HUS and 14 campylobacteriosis cases). Estimated below is the cost of lost work days; the calculation is split between non-hospitalised and hospitalised.

(i) Non-hospitalised

MPI assumes that 50 percent of the people who got sick from consuming raw milk in 2014 were in the workforce. This gives:

$$678-1,452 \text{ illnesses} \times 0.5 = 339-726 \text{ illnesses.}$$

Scott et al assumed that each non-hospitalised case would have five days off work (as cited in Sheerin, 2014).

Using the average weekly wage of \$991 per week (from Statistics New Zealand's 2014 income survey) and New Zealand's company tax rate of 28 percent, we can calculate the income lost from the non-hospitalised cases:

$$(339-726) \times \$991 \times 0.28 = \mathbf{\$94,066 - \$201,450.}$$

Carer days lost

We assume that 20 percent of the rest of the cases require the care of a member of the workforce (as this group will be mostly made up of children). This gives 68–142 people. The company tax lost due to this group being off work is:

$$(68-142) \times \$991 \times 0.28 = \mathbf{\$18,869 - \$39,402.}$$

Total income tax lost for non-hospitalised cases is:

$$\begin{aligned} &(\$94,066 + \$18,869) - (\$201,450 - \$39,402) \\ &= \mathbf{\$112,935 - \$240,852.} \end{aligned}$$

(ii) Hospitalised

The average length of a hospital stay for an HUS case is 15.6 days (Gadiel & Abelson, 2010).

Therefore, for the HUS case, that amounts to 3.12 weeks off work, $3.12 \times \$991 \times 0.28 = \mathbf{\$866}$. After scaling (0.35–0.75) this gives **\\$303 – \\$649**.

Scaling the rest of the hospitalised cases gives 6.3–13.5. If we assume these cases took twice the amount of time off work as the non-hospitalised cases, that is, on average 10 days (if the hospitalised case was a child this will be the carer's time), we can calculate the following:

$$(6.3-13.5) \times 2 \times \$991 \times 0.28 = \mathbf{\$3,496- \$7,492}.$$

Therefore, the total of lost taxation collected by the Government would be:

$$\begin{aligned} & \mathbf{\$112,935 - \$240,852} \text{ (non-hospitalised) +} \\ & \quad \mathbf{\$303 - \$649} \text{ (HUS)} \\ & + \mathbf{\$3,496 - \$7,492} \text{ (hospitalised non-HUS)} \\ & = \$116,734 - \$248,993 \\ & = \mathbf{\$120,000 - \$250,000} \text{ (rounded to two significant figures).} \end{aligned}$$

Reference point (retail sales)

Summary

Costs to public health system	\$1,600,000 – \$3,400,000
Lost tax revenue	\$180,000 – \$380,000

Explanation

Costs to public health

Rates of illness are correlated to the quantity consumed. Therefore, any increase in quantity consumed will increase the cost to the Government of illnesses proportionate to the increase in quantity. The quantity consumed is assumed to increase by 50 percent under the reference point.

This gives costs to public health system of:

$$\begin{aligned} & (\$1,049,394 - \$2,245,296) \times 1.5 \\ & = \$1,574,091 - \$3,367,944 \\ & = \mathbf{\$1,600,000 - \$3,400,000} \text{ (rounded to two significant figures).} \end{aligned}$$

Costs of lost taxation are similarly related to levels of illness, so are similarly adjusted, giving:

$$\begin{aligned} & (\$117,513 - \$250,663) \times 1.5 \\ & = \$176,269.5 - \$375,995 \\ & = \mathbf{\$180,000 - \$380,000} \text{ (rounded to two significant figures).} \end{aligned}$$

Prohibition

Summary

Costs to public health system	\$260,000 – \$560,000
Lost tax revenue	\$29,000 – \$63,000

Explanation

MPI has assumed that quantity consumed will decrease by 75 percent under prohibition, compared with the current situation, and therefore so will the costs of illness by the same factor. The public health costs are thus:

$$\begin{aligned} &(\$1,049,394 - \$2,245,296) \times 0.25 \\ &= \$262,349 - \$561,324 \\ &= \mathbf{\$260,000 - \$560,000} \text{ (rounded to two significant figures).} \end{aligned}$$

Tax losses will similarly decrease, giving:

$$\begin{aligned} &(\$117,513 - \$250,663) \times 0.25 \\ &= \$29,378 - \$62,666 \\ &= \mathbf{\$29,000 - \$63,000} \text{ (rounded to two significant figures).} \end{aligned}$$

ATTACHMENT 4: CHANGE IN CONSUMER SURPLUS

Price estimate

The current price of raw milk is estimated at an average of \$2.50 per litre. This has been calculated by taking the average of several suppliers' prices as listed on their websites.

A 2 litre bottle of raw milk from Gorge Fresh Organics is \$3.50 on the farm or \$4.00 when collected at a collection point. Manna Milk charges \$2.50 from the farm gate and \$3.20 for a 1 litre bottle delivered to a collection point. Walnut Tree Farm charges \$2.50 for a 1 litre bottle from the farm.¹⁹

This gives an average of \$2.60 per litre for collection points and \$2.25 per litre for farm-gate sales. The average \$2.50 per litre assumes more milk is sold via collection points than from the farm.

Quantity estimate

Estimates of quantity purchased are as noted earlier:

- 1,560,000 litres per year under the reference point (retail sales) (a 50 percent increase on current consumption);
- 1,040,000 litres per year for current consumption;
- 260,000 litres under prohibition (a 75 percent decrease from current consumption).

In calculating a range for the consumer surplus it is assumed this could vary by 25 percent in either direction. (This quantity range has not, however, been factored into the health costs ranges. If it was, the size of the ranges would increase but the mid-points would remain the same.)

Supply curve

The supply curve is assumed to be flat. This is based on the fact that raw milk is a small proportion of total milk production, and so producers could switch to raw milk supply relatively easily (with some margin in price to compensate for any additional costs of supply of raw milk).

The supply curve is assumed not to move between the current situation, reference point (retail sales) and prohibition.

As noted earlier, the analysis ignores any adjustment costs – from suppliers either entering or leaving the market.

Demand curve

The demand curve is assumed to be downward sloping, and its slope is estimated relative to that for pasteurised milk.

The price elasticity of demand for pasteurised milk in New Zealand is -0.453 .²⁰ It is assumed that the slope of the demand curve for raw milk is flatter than for pasteurised milk (which is a

¹⁹ Gorge Fresh Organics <http://gorgefresh.co.nz/>; Manna Milk <http://www.mannamilk.co.nz/>; Walnut Tree Farm <http://www.walnuttreefarm.co.nz/our-milk>. Accessed 22 May 2015.

²⁰ This price elasticity comes from the Organisation for Economic Cooperation and Development–Food and Agriculture Organization Aglink model database at www.agri-outlook.org/aglink-cosimo-collaboration (retrieved 18 March 2015). Only authorised member country collaborators are allowed direct access to the full Aglink/cosimo model and its database (including its parameters). The estimate is not recent; however, the estimate for Australia is -0.12 , United States is -0.56 and European Union is -0.10 , indicating that the New Zealand estimate is not unreasonable.

relatively inelastic good) under the reference point (retail sales). This is because the evidence shows that, for a subgroup of consumers, raw milk is purchased because it is cheaper than pasteurised milk.

It is assumed there is a further group of consumers who purchase raw milk because they believe it is superior to pasteurised milk and thus are prepared to pay more, but will switch back to pasteurised milk if the price margin increases too far.

Finally, it is assumed there is a small subgroup of consumers who are much less sensitive to price and who will continue to purchase raw milk even if it is prohibited. Based on this assumption, the slope of the demand curve under prohibition is steeper than under the reference point (retail sales).

Estimate of change of consumer surplus (see diagram 1)

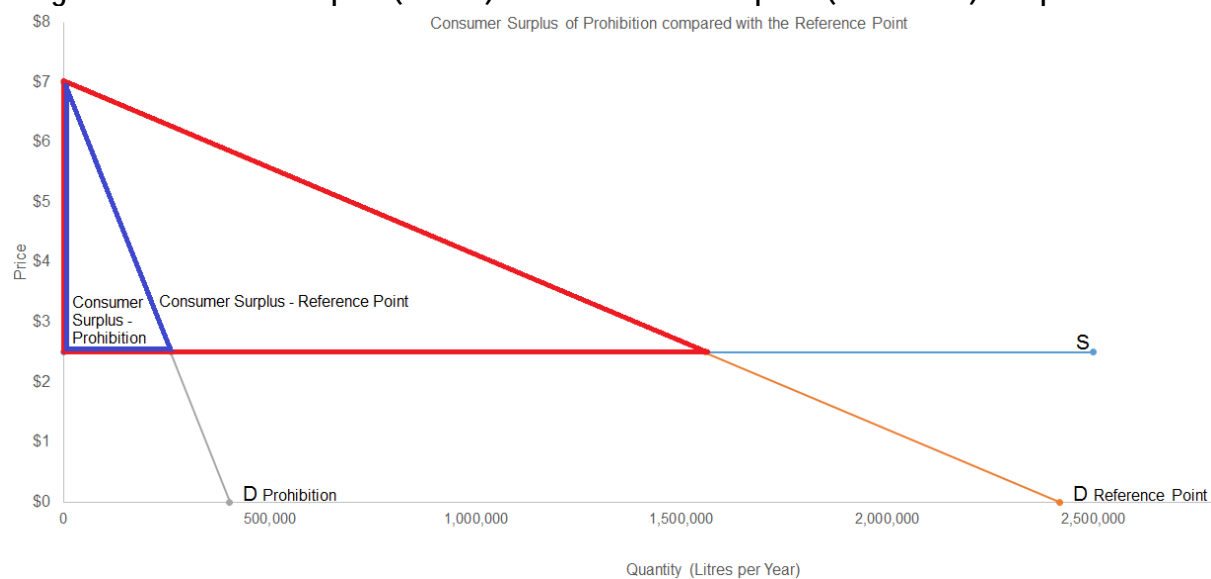
The consumer surplus for the reference point (retail sales), current situation and prohibition are calculated as follows:

- consumer surplus under the reference point (retail sales):
$$= (1,560,000 \text{ litres} \times \$4.50 \text{ per litre}) \div 2$$
$$= \$3,510,000$$
- consumer surplus current situation:
$$= (1,040,000 \text{ litres} \times \$4.50 \text{ per litre}) \div 2$$
$$= \$2,340,000$$
- consumer surplus under prohibition:
$$= (260,000 \text{ litres} \times \$4.50 \text{ per litre}) \div 2$$
$$= \$585,000.$$

Factoring in a range in consumption of plus or minus 25 percent around these mid-points gives the following figures:

- consumer surplus under the reference point (retail sales):
$$= \$2,632,500 - \$4,387,500$$
$$= \$2,600,000 - \$4,400,000 \text{ (rounded to two significant figures)}$$
- consumer surplus current situation:
$$= \$1,755,000 - \$2,925,000$$
$$= \$1,800,000 - \$2,900,000 \text{ (rounded to two significant figures)}$$
- consumer surplus under prohibition:
$$= \$438,750 - \$731,250$$
$$= \$440,000 - \$730,000 \text{ (rounded to two significant figures)}.$$

Diagram 1: Consumer surplus (annual) under the reference point (retail sales) and prohibition



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Appendix II: Analysis of stakeholder submissions

Option 1: Farm sales with limits on the quantity sold and purchased

Submitter comments

1. Public health groups and dairy processors that recognised prohibition was not feasible, supported this option. They considered it provided the least access and was therefore the best solution for decreasing outbreaks of illness. Dairy processors, however, suggested additional requirements, namely:
 - dairy farms supplying raw drinking milk must be independent with separate infrastructure;
 - more stringent milk harvesting and cooling practices must be applied; and
 - full disclosure of health risks via labelling and public information must be provided.
2. Consumers strongly opposed option 1. They argued that the lack of access and the volume restrictions would result in an increase in outbreaks of foodborne illness due to the formation of an underground market and a return to the consumption of “unhealthy” raw milk intended for pasteurisation. They considered that, if suppliers were “doing things right”, quantity was unimportant. They also stated that compliance costs were too onerous for hobby farmers. A volume limit of “100 litres per day (or the milking of 35 to 40 cows)”²¹ was thought to be viable for a stand-alone operation.

Ministry for Primary Industries analysis

3. Overall, option 1 would likely reduce illness associated with the consumption of raw milk but it provides almost no choice for consumers. Given the strong demand for raw milk and a history of allowing sales to consumers, the Ministry for Primary Industries (MPI) considers consumption will occur, either:
 - legally through sales direct from farmer to consumer at the farm – raw milk is a high-risk product and the requirements that apply to this option do not include measures such as verification, pathogen testing or milk harvesting training;
 - by circumventing the law (for example, by buying raw milk as pet food); and
 - illegally.

Some foodborne illness will therefore be likely. In Melbourne, in 2014, a three-year-old child died from consuming raw milk sold as “bathing milk”, despite a prohibition on the sale of raw drinking milk.

4. No evidence exists to justify a requirement for the supply of raw drinking milk to be from independent farms. However, the possibility of cross-contamination with raw milk produced to a standard for purposes other than drinking requires a risk management solution that includes a separate infrastructure. Other additional requirements proposed by dairy processors will be consulted on further, following Cabinet’s decision on the overall approach.
5. MPI’s scientific risk assessment predicts that the quantity of raw milk consumed positively correlates with the number of illnesses. Even if the supplier is “doing things right”, pathogens may still occur in raw milk.
6. Option 1 is not financially viable but would allow farmers selling small quantities to supplement their incomes, provided they meet production and food safety controls (including animal health, hygiene and labelling).

²¹ Thirty-five to 40 cows would milk considerably more than 100 litres (600–800 litres is more approximate).

Option 2: Farm sales with no limits on the quantity sold or purchased

Submitter comments

7. Only a small group of consumers supported this option as most had concerns about accessibility and maintaining the cold temperature during transportation. Dairy processors and consumers considered this option likely to result in illegal access and increased outbreaks of foodborne illness. Consequently, dairy processors were also concerned with the risks to New Zealand's reputation as a supplier of safe food.
8. Both consumers and suppliers argued the production requirements were unnecessarily restrictive and therefore costly. Consumers claimed option 2 was not viable; however, some suppliers stated that they were currently operating in a manner similar to option 2.
9. A few consumers suggested a sale limit of "500 litres per day or 40 cows per farm"²² for suppliers, to ensure farms remained small and well managed.
10. A few submitters opposed the concept of lesser production requirements for those supplying minimal amounts of raw milk (40 litres or less per day) compared with those producing on a more commercial basis (more than 40 litres per day). They considered the rules either effective enough to reduce the risk to an acceptable level or not. In contrast, suppliers supported the concept but opposed the low cut-off quantity between the tiers.
11. Submitters from the food industry supported prohibition but recognised this was not put forward as an option during consultation so they supported option 2. They believed it would be the most feasible approach in managing the food safety risks. A public health agency considered option 2 or option 3 practical options given the demand for raw milk. However, the agency wanted more stringent controls in place

Ministry for Primary Industries analysis

12. MPI acknowledges that some consumers would circumvent the law or act illegally (including operating de facto collection points) because the restricted point of sale would not provide sufficient choice for some consumers, particularly those living in urban areas. MPI also agrees a food safety risk exists when consumers transport raw milk from the farm.
13. Despite the above, MPI considers that, overall (and with new offence provisions), the incidence of illness associated with raw milk consumption would likely decrease under this option. This is because:
 - many consumers may only want to purchase raw milk from suppliers who are known to comply with the controls set by government;
 - suppliers, who have invested money and are selling more than 40 litres per day would likely report on illegal activity to protect their business and industry;
 - labelling requirements and education would help in raising consumers' awareness of the risk from drinking raw milk.

Ongoing compliance monitoring will be required.

14. MPI aims to introduce measures only where there is sufficient scientific evidence to suggest a desired effect. It does not consider the production requirements unnecessarily restrictive as they each aim to minimise the food safety risks. Any new compliance costs will depend on how well a supplier is currently minimising the risks. A few suppliers stated that they were following practices similar to those proposed under option 2. These suppliers were clearly financially viable. As with option 1, those selling

²² Forty cows would milk considerably more than 500 litres (800 litres is more approximate).

limited volumes would be able to supplement their income. However, suppliers who have taken the risk of delivering via collection points would have to close or modify their operation.

15. The production requirements for those selling limited volumes are strict as they include almost all the food safety measures that can be implemented for raw milk without using a processing method such as pasteurisation (for example, requirements on milk harvesting, cooling and refrigeration). However, they do not include measures that are imposed on those selling larger volumes such as verification checks, pathogen testing, prescriptive dairy inspections, veterinary visits and training in good milk harvesting practice.
16. MPI considers 40 litres per day an appropriate cut-off between the tiers. This value is intended to be equivalent to milking one-to-two cows for raw drinking milk and is estimated from national dairy production statistics. MPI will consult further on this issue if the final policy adopts a two-tiered approach.
17. Finally, while MPI considers the number of people drinking raw milk a food safety risk, it cannot justify a requirement for the size of a farm as a risk management measure. There is no evidence that, when all variables are the same, sales from smaller farms pose a substantially different risk to sales from larger farms.

Option 3: Farm sales and home deliveries with no limits on the quantity sold or purchased and with production and food safety exemptions for lower quantities sold

Submitter comments

18. Although some consumers supported option 3, most argued it would not meet the current demand for raw milk and would not be financially viable. Almost all suppliers of raw milk to consumers expressed similar views. Both groups also believed that related outbreaks of illness would increase because the cold temperature of home-delivered milk would not be maintained due to consumers being unable to immediately pick it up from their doorstep. Consumers were additionally concerned that they would be forced to buy raw milk from the nearest rather than the best supplier.
19. Dairy processors and public health professionals did not support option 3 because they considered the increased access would increase the incidence of foodborne illness. A public health agency that considered option 2 practical, provided further modifications were made, also thought the same for option 3.

Ministry for Primary Industries analysis

20. Under this option, the price of milk would likely increase because suppliers would bear the total cost of distribution and pass this on to consumers. However, consumers collecting from the farm or via collection points already bear travel and time costs, which would cease with home deliveries.
21. MPI acknowledges a food safety risk exists if consumers do not appropriately manage the cold temperatures when raw milk is delivered to their home. However, it notes that home deliveries that include perishable foods are becoming more popular. MPI provides information on food safety in the home. Under this option, this would be extended to include information on home deliveries of raw milk.
22. MPI disputes the implication that the nearest supplier might not be the best supplier for home-delivered milk because all such milk would have to adhere to the same strict production requirements. At present, suppliers are operating in highly variable ways due to difficulties with implementing the legislation.

Other approaches advocated by submitters

Submitter comments

23. Several other approaches were proposed. These included: sales direct from the dairy farmer to consumers at farmers' markets, specialty shops and/or dairies; retail sales; and self-regulation. Prohibition and sales via collection points were strongly advocated by particular stakeholders and are outlined in further detail below.
24. Some submitters proposed additional requirements such as:
 - a "cease to supply" provision for a region, or nationally, if a large outbreak of foodborne illness were associated with raw milk;
 - an exemption (for example, no requirements apply if a supplier sells 120 litres or less each day and consumers do not purchase more than 6 litres) or an option for very small suppliers that principally includes a requirement around education and labelling;
 - a Food Control Plan under the Food Act 2014 rather than a Regulated Control Scheme under the Animal Products Act 1999;
 - a licensing system to provide consumers with assurance that the standards at a farm are of high quality and safe.

Ministry for Primary Industries analysis

25. No new evidence was provided to support sales direct from the dairy farmer to consumers at farmers' markets, specialty shops and/or dairies; collection points, retail sales; or self-regulation. MPI considers there are no circumstances for an exemption, given that raw milk is a high-risk food. Further consideration will, however, be given to a "cease to supply" provision when targeted consultation on implementing the Government's policy occurs.
26. Raw milk is an animal product, so on-farm production practices, such as animal health and hygiene, must be regulated under the Animal Products Act 1999. A Food Control Plan under the Food Act 2014 is not necessary because it will simply duplicate requirements that are necessary under the Animal Products Act 1999.
27. MPI does not agree with government providing an assurance system, because all suppliers must follow strict production requirements. The raw milk industry may, however, decide to develop such a system for its customers.

Sales from the farm and via collection points with no limits on quantity

Submitter comments

28. The great majority of consumers and suppliers supported option 2 plus sales via collection points, provided additional food safety requirements were applied to the collection-point process. They stated that:
 - foodborne illness would decrease because:
 - rigorous production requirements would apply;
 - refrigeration will be maintained until pick-up;
 - pre-ordering would provide an easy way of keeping records;
 - a signed agreement by consumers would ensure they were fully informed of the risks; and
 - any outbreaks would result in a drop in demand for that supplier;
 - consumer demand would be met;
 - the option would be financially viable; and

- compliance would be easy as sales would be unlikely to go beyond those intended, and monitoring refrigeration requirements would be simple.
29. The above submitters did, however, acknowledge that increased access could increase the number of people drinking raw milk, which could in turn increase the risk of illness.

Ministry for Primary Industries analysis

30. Collection points were not consulted on in 2014 because MPI considered the food safety risks too high. If this approach were made explicitly legal, the status quo would change, because suppliers currently selling only from the farm would likely extend their operations in response to the new opportunity. New operators would also enter the market, given that this approach is financially attractive. A model similar to retail sales could easily evolve.
31. Because no level of control measure would eliminate the risk of foodborne illness, the increased availability and consumption would increase the risk of illness and may affect New Zealand's reputation as a supplier of safe food. This increase would occur despite collection points offering a better approach for maintaining the cold temperature, when compared with the other options.
32. MPI acknowledges, however, that collection points would meet the current demand and recognise existing practices to purchase raw milk from places other than the farm. MPI also considers that certain additional measures to those provided by submitters could be applied to help minimise the food safety risks. These measures are unlikely to overcome the risks from increased consumption.
33. Although consumers and suppliers are likely to be more compliant with this approach, the increased supply would still result in the need for additional MPI resources, particularly given the difficulty in defining "collection points" in a way that distinguishes them from general retail outlets.

Prohibition

Submitter comments

34. Dairy processors, public health agencies and veterinarians supported prohibition on the basis that food safety is the priority for regulation of raw drinking milk, taking precedence over consumer choice. These groups did not consider raw milk safe under any circumstances, particularly for vulnerable groups such as babies. They considered there was overwhelming evidence of outbreaks of illness caused by raw milk sales and that pasteurisation minimises the risks of foodborne illness to an acceptable level. They also stated that prohibition is important if there is an emergent event (such as an increase in bovine tuberculosis), as this would increase illnesses.

Ministry for Primary Industries analysis

35. MPI agrees that pasteurisation is the most effective way of reducing foodborne illness. However, consumer choice is an important consideration in New Zealand food regulation – no food (other than certain toxic plants and fungi) is prohibited from sale in New Zealand, despite there being risks with the consumption of many foods.
36. Victoria, Australia has attempted to tighten its prohibition on the sale of raw cows' milk for consumption by requiring suppliers to process the milk so that it is not consumable (for example, by adding a bitter tasting agent). MPI considers that consumers will still access the food, either by circumventing the law or by acting illegally. Many submitters to MPI's 2014 consultation document stated that they would collectively purchase a cow for milking (through a cow share agreement) if the sale of raw milk to consumers was prohibited.