Consultation on raw milk sales
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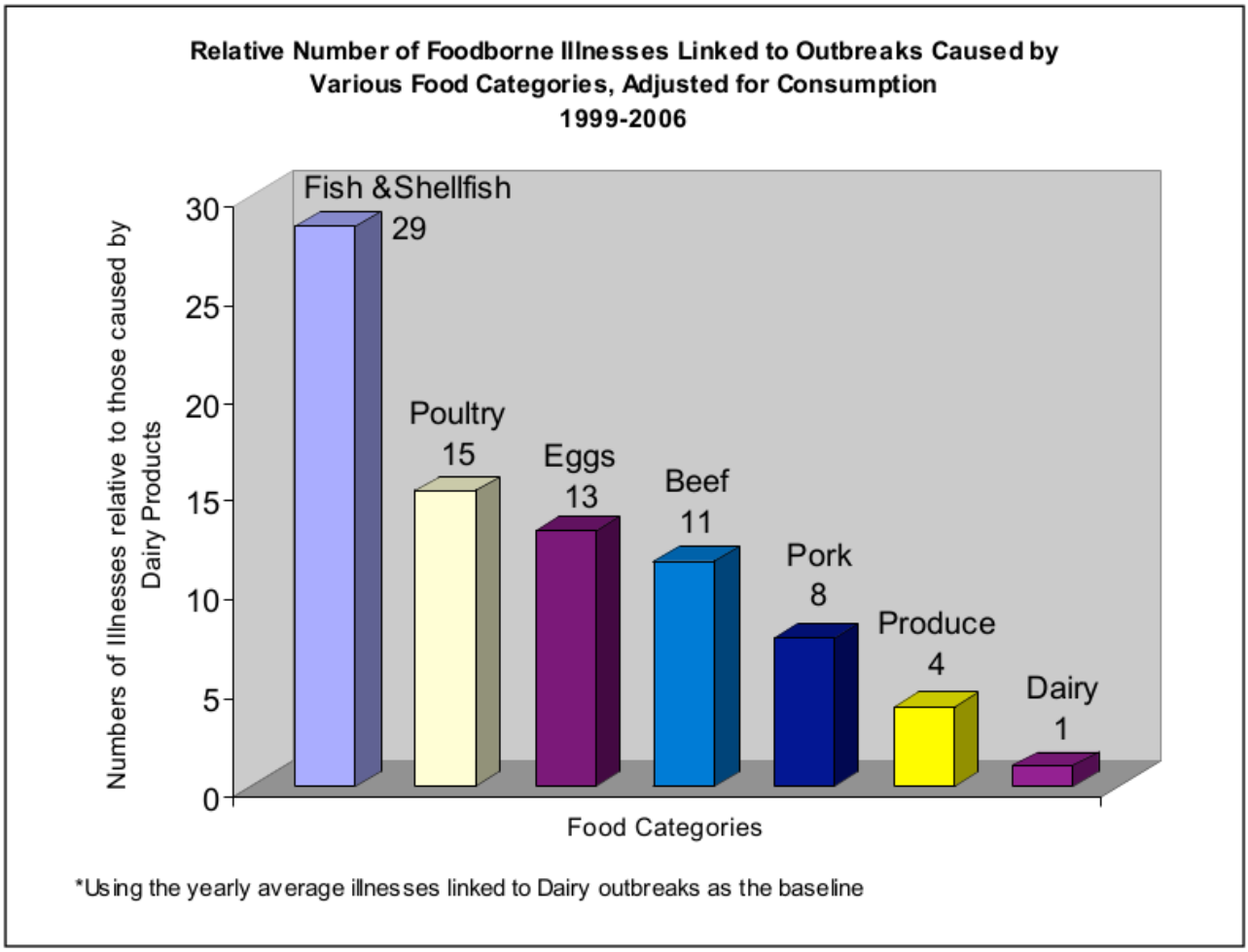
How safe is dairy?

Dairy – in general, meaning almost all of it is pasteurized – is the safest food.



This graph is reproduced from "Outbreak Alert! 2008"[1], published by the US Center for Science in the Public Interest (CSPI).

1 http://www.cspinet.org/new/pdf/outbreak_alert_2008_report_final.pdf

Politics

I study the inner workings of governments. Governments essentially serve two constituencies:

- Voters
- Various elite groups, who fall into three main areas: commercial, financial, and international politics, that is, governments outside New Zealand. Typically the interests of these groups dovetail or are the same.

Legally governments are in a position of trust to the first group only. Trustees are required to act in the interests of their settlor. To the extent that a government favours the interests of the second group over the first, therefore, it is acting in breach of trust, which is unlawful. Sadly in spite of this, it happens often, and this process is generally referred to as “political corruption”.

Corruption is concealed through the following psychological formula:

1. **Presumption of honesty.** In day-to-day interactions between people, it is reasonable to presume honesty. Where the other party has the possibility of significant gain through dishonesty, presumption of honesty no longer holds. This is true of any position of power, therefore it is invalid to presume governments and their agents to be honest about their intentions. People in government come across as reasonable, sober, honest people, whether they are or not. People in general are not equipped to tell the difference.
2. **Inversion of the onus of proof.** The government should be expected to prove its case. However, often the need for a law change is based on a “public debate” that is little more than a propaganda campaign. It is left up to critics of the government to prove the government is dishonest, but unlike the government, they do not have any taxpayer's money to hire a research assistant. It is also hard to find a platform in which to present their dissenting views.
3. **Tedium and obfuscation.** Long, boring documents serve to put people off investigating what the government is doing.
4. **Plusible deniability.** Governments are typically careful to make their malfeasance plausibly deniable. When found out, they will say it was a mistake and they will promise to be more careful in future, or they will sack some scapegoat.
5. **Reductionist mindset.** Because of the points given above, it is difficult to prove government malfeasance, so we should presume that there are many cases for every one discovered. When a government is caught out, however, they appeal to a reductionist mindset, in which the one case being considered is seen as a rare exception, and it is presumed that the government acts honourably the rest of the time.

These factors combine to produce a false impression that corruption is rare, and this idea is reinforced in the media.

My point here is that, even though the government says its reason for reviewing raw milk regulation is entirely to protect public safety, it is not logical for us to take them at their word.

To establish guilt in English criminal law there must not only be a guilty act (actus reus) but also *mens rea*: a guilty mind or guilty intention. To prove mens rea in the absence of a confession, you must infer a person's intentions from their actions.

Similarly, to establish whether we are talking about corruption or an honest mistake, we must infer the government's intentions from its actions.

Quantitative Microbial Risk Assessment (QMRA)

QMRA is the best method for establishing the safety of a food for a particular pathogen. It can be measured in two ways:

- The probability of illness per serving.
- The probability of illness for a consumer of the food in a year.

When given as a probability it is a small fraction of 1. It can also be given in terms of cases per 100,000 people per year for a consumer, or per 100,000 servings (or any other figure).

Is raw milk a high-risk food?

I will look primarily at campylobacter. The MPI's 2013/2014[2] assessment lists 21 raw milk related illness outbreaks, 13 of which were attributed to campylobacter. It's reasonable to say therefore that campylobacter is probably the dominant pathogen for raw milk cases.

MPI's 2013/2014 assessment contains a QMRA and gives the following figures for campylobacter (p1):

> The mean predicted numbers of illnesses per 100,000 average servings for various scenarios following consumption of untreated raw milk are:
>
> - 139 cases of campylobacteriosis, 70 cases of STEC, 8 cases of salmonellosis if consumed milk was purchased at the farm gate (urban population, no vending machines);
> - 124 cases of campylobacteriosis, 75 cases of STEC, 8 cases of salmonellosis if comsumed milk was purchased off-farm;
> - 30 cases of campylobacteriosis, 56 cases of STEC, 7 cases of salmonellosis if consumed milk was purchased at retail;
> - less than one case of listeriosis in susceptible populations was predicted for each of these scenarios.

It goes on to say something that turns out to be quite telling:

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2 Assessment of the microbiological risks associated with the consumption of raw milk, MPI Technical Paper No: 2014/12 http://www.foodsafety.govt.nz/elibrary/industry/raw-milk-sales-2014/2014-12-microbiological-risks-assessment-consumption-of-raw-milk.pdf

> Epidemiological evidence indicates that while the mean estimates generated using the median dose-response model under current conditions are **similar to those in Italy** and less than those from Australia, they are somewhat higher than those that might be actually occurring in New Zealand. *[my emphasis]*

By "Italy" the MPI is saying that their results are **similar to those of Giacometti et al**[3] (2012), summarized in a table on page 46 (Section 10.1):

> *Giacometti et al, 2012a*
>
> The risk for consumers aged 0-5 years predicted by the model 1-2 cases of campylobacteriosis and 0.02-0.09 cases of HUS per 10,000-20,000 consumers. The risk for consumers >5 years old predicted by the model was 0.1-0.5 cases of HUS per 10,000-20,000 consumers. Strict control of temperature during distribution had a significant effect on predicted rates of disease. This assessment assumed that about 60% of consumers eliminate risk by boiling raw milk before consumption.

The words "each year" that appear in the original are omitted in the MPI assessment quote above, leaving it making no sense. The abstract of Giacometti et al is quoted in full here:

> ABSTRACT:
> A quantitative risk assessment was developed to describe the risk of campylobacteriosis and hemolytic uremic syndrome (HUS) linked to consumption of raw milk sold in vending machines in Northern Italy. Exposure assessment considered the microbiological status of dairy farms, expected milk contamination, storage conditions from bulk tank to home storage, microbial growth during storage, destruction experiments, consumption frequency of raw milk, age of consumers, serving size, and consumption preference. The differential risk between milk handled under regulation conditions (4°C throughout all phases) and the worst field handling conditions was considered. The probability of Campylobacter jejuni infection was modeled with a single-hit dose-response beta-Poisson model, whereas for HUS an exponential dose-response model was chosen and two probabilities were used to model the higher susceptibility of children younger than 5 years old. **For every 10,000 to 20,000 consumers each year, the models predicted for the best and worst storage conditions, respectively, 2.12 and 1.14 campylobacteriosis cases** and 0.02 and 0.09 HUS cases in the 0- to 5-year age group and 0.1 and 0.5 HUS cases in the >5-year age group. The expected pediatric HUS cases do not differ considerably from those reported in Italy by the Minister of Health. The model developed may be a useful tool for extending the assessment of the risk of campylobacteriosis and HUS due to raw milk consumption at the national level in Italy. Considering the epidemiological implications of this study, the risk of illness linked to raw milk consumption should not be ignored and could be reduced by the use of simple measures. Boiling milk before consumption and strict control of temperatures by farmers during raw milk distribution have significant effects on campylobacteriosis and HUS and are

3 Quantitative risk assessment of verocytotoxin-producing Escherichia coli O157 and Campylobacter jejuni related to consumption of raw milk in a province in Northern Italy. *Giacometti F1, Serraino A, Bonilauri P, Ostanello F, Daminelli P, Finazzi G, Losio MN, Marchetti G, Liuzzo G, Zanoni RG, Rosmini R. J Food Prot. 2012 Nov;75(11):2031-8. doi: 10.4315/0362-028X.JFP-12-163.* http://www.ncbi.nlm.nih.gov/pubmed/23127713

essential measures for risk management. *[my emphasis]*

Note also that the highlighted sentence of *Giacometti et al* is ambiguous, and the MPI are interpreting it to be saying nothing at all about campylobacter cases for people > 5 years old. Of the two ways of reading this sentence, the MPI chose the absurd one.

To compare these figures, we have to convert risk per 10,000 to 20,000 consumers per year to risk per 100,000 servings. This is simply a case of multiplying the number of consumers by the average number of servings consumed in a year, to get the total number of servings.

In section 6.3.5 the MPI gives the figures 1.1 servings/consumer/day for adults and 1.4 for children for general consumption of cold milk in New Zealand (milk in general, not raw milk). Let us be a little more conservative, and err on the side of raw milk being less safe, by assuming two servings per week, or 100 per year.

From this, the probability of illness per serving can be calculated as follows for each permutation of the above:

Cases/year	Population	Servings/year	Probability of illness/serving	Probability of illness/ 100,000 servings
1.14	10,000	100	1.14×10^{-6}	0.114
2.12	10,000	100	2.12×10^{-6}	0.212
1.14	20,000	100	5.7×10^{-7}	0.057
2.12	20,000	100	1.06×10^{-6}	0.106

Now that the figures are in the same units, we can compare the MPI assessment, Giacometti et al, and a third study, “Microbiological Risk Assessment of Raw Cow Milk” by Food Standards Australia New Zealand, December 2009.[4] The right-hand column is the mean of the values in the middle column.

Study	Probability of illness/100,000 servings	Mean probability of illness for listed scenarios/100,000 servings
Giacometti et al (2012)	0.057 to 0.212	0.13
FSANZ (2009)	0.1, 4.7, 19.9	8.23
MPI (2014)	30, 124, 139	97.67

By way of comparison, “E. coli O157:H7 in beefburgers produced in the Republic of Ireland: A quantitative microbial risk assessment”[5] gives the probability of E. coli infection as 1.1×10^{-6} or 1.1

4 http://www.foodstandards.govt.nz/code/proposals/documents/P1007%20PPPS%20for%20raw%20milk%201AR%20SD1%20Cow%20milk%20Risk%20Assessment.pdf

5 http://www.teagasc.ie/food/research/safety/risk_ecoli.pdf
“The calculated mean probability of E. coli O157:H7 infection and ensuing illness from a serving of minced beef

per million servings. The year of the study is not given, but the newest reference in it is 2006. We multiply this figure by 0.1 to convert from risk per million to risk per 100,000 servings.

Study	Probability of illness/100,000 servings	Mean probability of illness for listed scenarios/100,000 servings
E. coli in beef burgers	0.11	0.11

While we are talking about different pathogens in both cases, they are both common ones for the respective food. This means that raw milk is approximately the same risk as beef burgers.

From the CSPI graph above we can see that the risk of beef is about medium compared with other foods. Assuming beef burgers are the same as beef, and since beef burgers and raw milk have almost identical levels of risk – we can *very* approximately say that raw milk is a **medium risk food**.

How dangerous?

According to this simple analysis, the MPI assessment, which is associated with the present consultation, claims raw milk is 751 times[6] more dangerous than *Giacometti et al* do, yet it says the following immediately after presenting its figures:

> Epidemiological evidence indicates that while the mean estimates generated using the median dose-response model under current conditions are **similar to those in Italy**...

But I have just shown this is not true. Surely the MPI has made a mistake? Let's check their figures against reality.

The MPI assessment lists 21 records of food poisoning outbreaks from 2006 to 2012 from the EpiSurv database, that it identified as being suggestive (18 of them) or strongly associated (3 of them) with raw milk consumption. With these types of systems only a certain percentage of cases are actually reported, so the true number of outbreaks will always be greater than the reported number. So let's use the MPI's figures to estimate what proportion of cases are reported on EpiSurv.

Here is a list of the numbers of people reported as suffering food poisoning from raw milk, according to MPI's reading of EpiSurv data. To ensure we are measuring the same thing, here I am counting only the 13 cases where the pathogen was campylobacter.

Year	Reported numbers of persons sick from campylobacter associated with raw milk consumption for each	Total reported persons sick from campylobacter associated with raw milk consumption for the year

was found to be log 1.1 x 10^{-6} ($\log_{10}$ −5.94) (90^{th} percentile range $\log_{10}$ −8.1 to $\log_{10}$ −3.86) which is approximately 1 burger in a million."

6 The risk according to MPI, 97.67 divided by the Giacometti et al risk of 0.13.

	outbreak	
2006		0
2007	6	6
2008	2	2
2009	2, 16	18
2010	4, 3, 2	9
2011	4, 4, 9	17
2012	4, 2, 5	11
Mean persons affected per year		9.0

A MPI telephone survey (p11 of the consultation document) in New Zealand concluded that 5% of respondents currently consume raw milk. The United States Centers for Disease Control (CDC) estimated in 2007 that 3% of the US population drink raw milk[7] – a similar figure.

The US figure is based on the respondent having drunk raw milk in the last week. Two servings per week (or 100 per year), which I have used as my figure will give a high probability that a person has drunk raw milk within the last week if asked on a random day, so this number of servings per year is about right for the US figure.

Let us estimate how many *actual* illnesses would be predicted by the MPI's figures, and compare that to the number *reported*, which we expect to be less than the actual number.

The population of New Zealand is 4,200,000. 5% of that, the number who “currently consume raw milk” would be 210,000. At 100 servings per year per person, they would be consuming 21,000,000 servings per year in total. Using my mean of MPI's figures of 97.67 per 100,000, that comes to 21,000,000 * 97.67 / 100,000 = 20,510 cases of raw milk-caused campylobacter illness per year.

The reported cases per year are 9.0 as mentioned. This means that EpiSurv is underreporting by a factor of 20,510 / 9.0 = 2278. EpiSurv is such an ineffective system, that it is only successfully reporting 1 out of every 2278 cases.

Do you believe that?

Taking the Irish beef burger study to be true, the MPI is saying raw milk is 888 times more dangerous than beef.[8]

The United States CSPI graph presented at the start of this document says beef is 11 times more dangerous than dairy. If we assume that beef burgers are the same as beef, and we use the Irish figure for beef burgers of 0.11 cases per 100,000, and my figure that the MPI's risk for campylobacter is 888 times the risk for E. coli in beef burgers in Ireland, then raw milk is 9768 times (11 times 888) more dangerous than all dairy in general in the United States.

7 http://www.cdc.gov/foodnet/surveys/FNExpAtl03022011.pdf

8 97.67 cases per 100,000 servings for the MPI's figure for raw milk divided by the Irish figure of 0.11 for E coli in beef.

Let's guess that the average raw milk drinker drinks 20% raw and 80% pasteurized. If so, then with the US figure of 3%, we would expect 0.6 % of all milk drunk to be raw milk.

We further assume that raw milk in the US has the same general level of danger as it does in New Zealand.

With these assumptions, we can conclude that 0.6% of milk in the US is 9768 times more dangerous than dairy in general, which must include raw milk. What?

So we have

- According to the MPI's risk assessment there should be 20,210 cases of campylobacter illness from raw milk every year in New Zealand.
- Therefore the EpiSurv database is reporting only one out of every 2278 cases.
- The 0.6% of milk in the US that is raw is 9768 times more dangerous than dairy in general (which must include raw milk).

These conclusions are absurd.

This type of argument is called “reductio ad absurdum”. If you follow a logical argument through and reach an absurd conclusion, then you have proven that at least one of the premises is wrong.

If the premises I have introduced are all correct, then the MPI's risk assessment figure for campylobacter must be wrong.

If this discrepancy should be pointed out in public, I predict that the MPI will say, using the principle of plausibly deniability, “We are so sorry – we made a mistake.” Then they will come out with a new report with a figure that is a bit less inflated, and say “See? It's still dangerous!”

Codex Alimentarius and the Food Bill

In a submission I (Stephen Blackheath) wrote on the Food Bill, I established certain conclusions. I will not re-state the arguments here, but I will use the following conclusions in the present argument:

- The Food Bill is apparently designed to easily allow at a later date for Codex Alimentarius (a committee of the United Nations Food and Agriculture Administration [FAO]) to write food standards with the force of law in New Zealand. This is done through a privision called “material incorporated by reference.” Any updates to such material are automatically incorporated, effectively handing the power to write food standards over.
- Both the World Trade Organization and an earlier draft of the Trans Pacific Partnership (a trade agreement not yet agreed but currently being negotiated in secret) require New Zealand to harmonize with Codex Alimentarius food standards. It is possible that the reason for the secrecy of the Trans Pacific Partnership is so that it can be partially implemented before it is officially agreed. This stratagem allows governments to implement the trickier required changes for “public safety” or other invented reasons without there being any

inconvenient evidence lying around to show that they are doing it because the TPP requires them to do it. This appears to be the case with the Food Bill.

- The parent organization of Codex Alimentarius, the Food and Agriculture Organization, sells political influence to corporations for money openly on its website.
- The intention is clearly that Codex Alimentarius will be able to write food standards for the entire world. This, along with the ability of companies to buy influence, will encourage the oligopolization / monopolization of the food industry worldwide. The big companies will get their way, because Codex Alimentarius has been set up to be lobbyable.
- With the effective ability of corporations to write food regulations, it is easy for them to lobby for a steady increase in compliance costs. This will drive small producers slowly into bankruptcy across the board while not affecting large producers.
- The New Zealand Government has used various tactics, including propaganda, timing (having the consultation at the same time as the much sexier Search and Surveillance Bill), obfuscation and distraction (It's OK! Your sausage sizzles are safe!), to ensure that the Food Bill passes without any debate about the real issue, the intended handing over of the power to write regulations to Codex Alimentarius. The media and the Green Party have assisted in these efforts. It has since passed into law.

Again, please refer to my Food Bill submission for the detailed argument.

Propaganda campaign

These articles have appeared in Stuff this year:

- 29 Mar 2014. **Farmer sorry over infected raw milk.**[9] Seven cases have been confirmed in those who purchased milk from Timaru Village Milk, but South Canterbury Medical Officer of Health Dr Daniel Williams said that number could be just the "tip of the iceberg".
- 31 Mar 2014. **Raw milk devotees unfazed by campylobacter.**[10] An outbreak of campylobacter in a batch of raw milk is not keeping fans of the controversial product away from the farm gate; However, the Ministry of Health (MoH) and the Ministry for Primary Industries warn that consuming raw milk could be risky as it could contain disease-carrying bacteria that could lead to gastroenteritis or other illnesses.
- 17 Mar 2014. **Raw milk not so beneficial?**[11] "Recently, unpasteurised raw milk consumption has increased in popularity and emerged into a nationwide movement despite the acknowledgement of risks associated with pathogens", the researchers wrote this week in the Annals of Family Medicine.
- 29 Mar 2014. **Raw milk contamination was down to human error.**[12] In warning people of

9 http://www.stuff.co.nz/business/farming/dairy/9879303/Farmer-sorry-over-infected-raw-milk
10 http://www.stuff.co.nz/national/health/9885455/Raw-milk-devotees-unfazed-by-campylobacter
11 http://www.stuff.co.nz/life-style/food-wine/drinks/9836317/Raw-milk-not-so-beneficial
12 http://www.stuff.co.nz/nelson-mail/news/9883233/Raw-milk-contamination-was-down-to-human-error

the risks of drinking raw milk, medical officer of health Daniel Williams described the confirmed cases as the "tip of the iceberg".

- 28 Mar 2014. **Raw milk triggers campylobacter outbreak.**[13] RAW MILK CAN BE 'DANGEROUS' Williams said drinking raw milk was "risky". "It can contain disease-causing bacteria and other organisms which can lead to gastroenteritis and other illnesses, some of which can be life-threatening," Williams said.

Propaganda campaigns are characterized by emotive language. There are several examples of fearmongering language in the quotes above:

- In warning people of the risks
- controversial product
- “tip of the iceberg”
- drinking raw milk was “risky”
- risks associated with pathogens
- disease-causing bacteria and other organisms
- life-threatening
- RAW MILK CAN BE 'DANGEROUS' (yes, it really was in capitals)

This fear-mongering is based on falsehoods, because raw milk is, as I have explained, a **medium risk food.**

We also see belittling language for raw milk drinkers:

- devotees
- fans

This campaign was well-timed for the consultation happening now, June 2014.

Possible strategy

It becomes possible to tentatively reverse engineer a possible strategy being used by the government:

1. In 2011 the MAF (now renamed to MPI) called for consultation on raw milk sales.[14]
2. At the time, the 2009 FSANZ study was current, and it put the risk for campylobacter at 8.23 cases per 100,000 servings. This was before Giacometti et al put it at a much lower figure (0.11 in 2012) and the MPI put it at an even higher figure (96.67 in 2013/2014).
3. For some reason, the MPI felt it was necessary to have another consultation in 2014, but this

13 http://www.stuff.co.nz/the-press/news/9879286/Raw-milk-triggers-campylobacter-outbreak
14 http://www.foodsafety.govt.nz/elibrary/industry/farm-gate-raw-milk-sales/

> time with a new assessment report inflating the risks even further, and after a media campaign about how dangerous it is.

Did they not get the answer they wanted the first time?

No need to ban it

Apart from the government's previously mentioned political reasons to promote monopolization in the food industry, though I can't prove it in this case, it likely also has companies lobbying it for profit reasons. 5% of respondents drinking raw milk is a significant number. The amount of profit that milk processing companies make on raw milk sales by small producers is zero. The amount of leverage that milk processing companies have over small raw milk producers is also zero.

The exchange of people back and forth between industry and government regulatory bodies is the way this form of corruption is implemented. It is a well-documented phenomenon, called “revolving door corruption.”

Food sovereignty and industry monopolization are opposites. Raw milk promotes food sovereignty because it is a transaction between local producers and local consumers. Multinational corporations can't control it unless the government steps in, and that is what I propose they are doing.

So if the MPI is prepared to misrepresent the risks of raw milk, why doesn't it just ban it outright?

Because it doesn't need to.

The options proposed by the MPI for controlling milk sales all have one thing in common: With the devil in the details, they can easily render raw milk production uneconomic. If it is not done commercially, then the rate of overall raw milk consumption will be safely down at levels where it won't affect profits (the commercial agenda) or hamper the total domination of large corporations over the food supply (the political agenda).

Dairy farms have to operate on a certain scale, or they are uneconomic. Options that limit the amount of milk that can be sold can destroy the economic viability of small raw milk operations.

While certain standards are essential to safety, options that impose stringent requirements can easily be used to create compliance costs that will render small dairy farms uneconomic.

Then they will slowly disappear and raw milk consumers will be left wondering why.

Conclusion

This submission proposes a plausible alternative hypothesis for the government's intention to the naïve and illogical idea that the government is only, and can only be, interested in protecting public health. This submission presents evidence, but it claims only to present a plausible hypothesis consistent with the evidence. It does not approach anything even close to proof that would stand up in court.

The hypothesis is as follows:

- Political agenda: The New Zealand Government is working from a political agenda imposed largely from outside New Zealand through the Trans Pacific Partnership, the World Trade Organization, and the United Nations to promote monopolization of the food industry world-wide.
- Commercial agenda: It is also likely to be interested in protecting the profits of companies that lobby it.
- This consultation was preceded by a propaganda campaign against raw milk.
- The MPI's assessment report gives an absurd, and clearly false, figure for the risks associated with campylobacter.
- We infer from the government's actions that the government's true intention is to effectively yet slowly and covertly close down raw milk sales without doing so outright, under the pretense of acting for public safety. It is certainly attempting to give itself the means to do so.

Recommendations

Giacometti et al gives a risk profile for raw milk that makes it a **medium risk food**, and therefore no special treatment is justified relative to other food types.

This consultation highlights a probable case of government corruption, and I propose that we investigate this case more thoroughly. If it turns out to be so, then we need to remove the corrupt individuals, institutions and systems.

Only then can we consider, in the light of the truth about raw milk, what level of regulation is appropriate.