

Schedule 1 to the Minutes of the
Public Works and Transportation
Committee meeting of Richmond
City Council held on Tuesday,
January 19, 2021.

Deanna Pfeifer

Are you aware?



Key take away points

- Rat poisons are poisoning the entire ecosystem
- Not effective long term
- Better alternatives exists

NECROPSY #1

Barred Owl

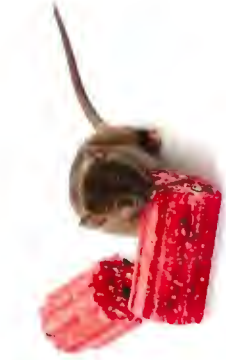
- Well-muscled
- No sign of trauma
- Excellent body condition
- Diffuse pallor
- Presence of brodifacoum and bromadiolone in the liver
- Final Diagnosis-suspect anticoagulant rodenticide toxicity

NECROPSY #2

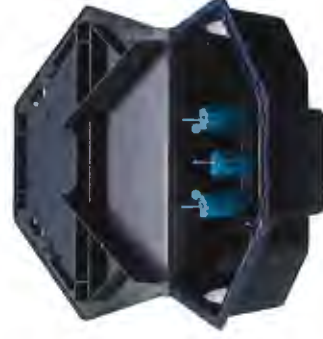
Great Horned Owl

- bromadiolone
- brodifacoum
- difetialone

What are Rodenticides?



- BROMADIALONE
- DIFENACOU
- BRODIFACOU
- DIFETIALONE



who is using rat poison?

- Pest Control Companies
- Homeowners
- Farmers



Rodent Bait Stations



Laws and policy

Federal

- Pest Control Products Act and Regulations
- Registration and re-evaluation
- Human health and safety
- Environment impact
- Value assessment
- Compliance and enforcement

Provincial/Territorial

- Transportation, sale, use, storage and disposal
- Training, certification and licensing of applicators and vendors
- Spills and accidents
- Permits and use restrictions
- Compliance and enforcement

Municipal

- Bylaws

So how did the poison get in the owl?

Between 1998-2003 70% of dead owls from BC had residues of at least one rodenticide-and the number of owls dying by poisons has only escalated over the recent years.



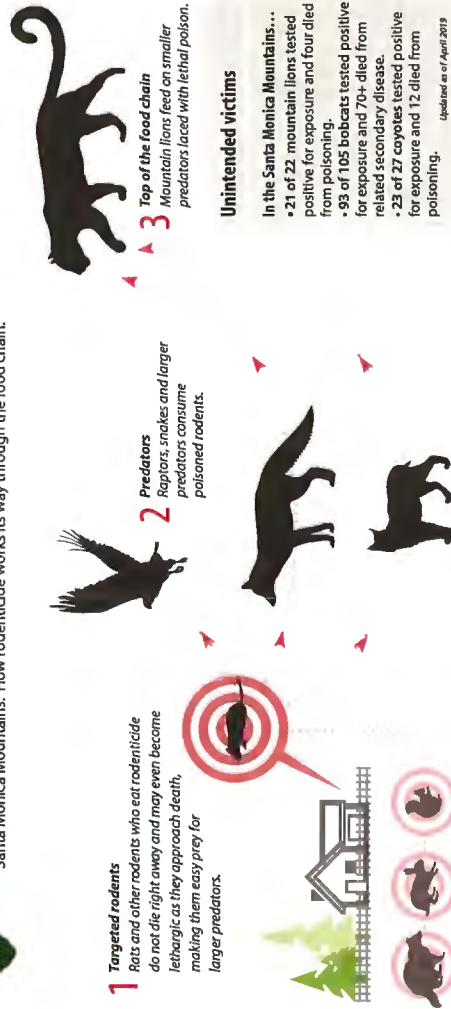
- Owls and other birds of prey are at a particularly high risk of secondary poisoning because of their dependence on rodents as a food source.





Lethal Dose: Rat Poison & Local Wildlife

Local residents may inadvertently be poisoning wildlife. National Park Service researchers have found a direct link between exposure to anticoagulant rodenticides, commonly known as rat poison, and the deaths of wildlife in and around the Santa Monica Mountains. How rodenticide works its way through the food chain:



How anticoagulant rodenticide kills
These compounds interrupt blood-clotting, which leads to uncontrolled bleeding and death. They may also suppress the animal's immune system, making it susceptible to other diseases. **Symptoms include:**

- Secondary disease, such as mange.
- Nosebleeds
- Bleeding gums
- Ruptured blood vessels, causing bruising
- Internal hemorrhaging
- Blood in urine and feces

What is mange?

A microscopic mite that burrows into the skin and causes...

1. Extreme itchiness and skin lesions.
2. Fluid and nutrient loss through the skin.
3. Infection, starvation, hypothermia or other complications, eventually leading to death.



Check the label

Here are the most common anticoagulant compounds:



- Bromadiolone
- Brodifacoum
- Diphacinone
- Difethialone

SOURCES: Santa Monica Mountains National Recreation Area research, L.E.K. Serveys, UrbanCarnivores.com

CREDIT: National Park Service
<http://1.usa.gov/1SuhsXv>

What is mange
disease?

<https://www.latimes.com/local/la-me-rat-poison-20140418-story.html>





Article

Impact of Rodenticides on the Coagulation Properties of Milk

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Abstract: In this study, we investigated the impact of the rodenticides (strychnine, bromadiolone, and brodifacoum) on milk pH, rennet coagulation time (RCT), and coagulum strength. Sub-lethal amounts of strychnine and bromadiolone produced an unusually large change in milk pH, compared to brodifacoum and brodifacoum on milk coagulation properties. All three studied rodenticides significantly affected RCT and coagulum strength. The presence of sub-lethal amounts of each individual rodenticide increased RCT by an overall mean of 17% ($p < 0.001$). Rodenticide contamination decreased coagulum strength by an overall mean of 26% ($p < 0.05$). Our results suggest that such changes could be noticeable at the farm, thus, potentially averting the mixture of contaminated milk with the tanker supply, and preventing downstream distribution to consumers.

Keywords: rat poison; milk contamination; milk coagulation; rennet coagulation time; rodenticides

1. Introduction

Dairy products are a significant part of typical U.S. diets [1]. In particular, milk's broad reach, in addition to its multi-stage processing chain, makes it especially vulnerable to intentional contamination. The processing of cheese begins with the coagulation of milk [2]. The coagulated milk is then further processed into the desired cheese product.

The coagulation of milk is a multi-stage process of overlapping physico-chemical changes. Cheese-making often begins with the aspartyl protease chymosin (also called rennet). Chymosin hydrolyzes the amide bond between Phe105 and Met106 of the κ -casein milk protein [3]. The catalyzed hydrolysis reaction releases the hydrophilic tail of κ -casein and the hydrophobic effect then drives aggregation of the casein micelles [2].

Milk coagulation depends on several parameters, including pH and temperature. The normal pH range of milk is between 6.4 and 6.8 [4]. A decrease in pH accelerates milk coagulation. At low pH, protonation of casein phosphate groups becomes more favorable, reducing zeta potential and, thus, accelerating coagulation [5]. However, a robust buffer prevents drastic pH changes in milk [6].

Overall, enzymatic coagulation is a physically apparent transformation driven by an underlying chemical one. The simultaneous cascade of events yields multiple points at which contaminant may play a role, whether in the pH, enzymatic hydrolysis, or hydrophobic assembly. In addition, more than a dozen antibiotic residues were found to significantly impact the milk coagulation process [7]. Thus, in this study, we hypothesized that rodenticides could contaminate the milk on farms and can affect the milk coagulation. During the coagulation process, several parameters are monitored for quality control purposes, including milk pH, gel strength, and rennet coagulation time (RCT) [8]. Of course, these parameters vary from day to day due to natural variations in milk quality and among individual cows [9]. However, changes that far exceed those expected due to normal variation may serve as

Foods 2018, 7, 57; doi:10.3390/foods7040057

www.mdpi.com/journal/foods

Threatens children and pets



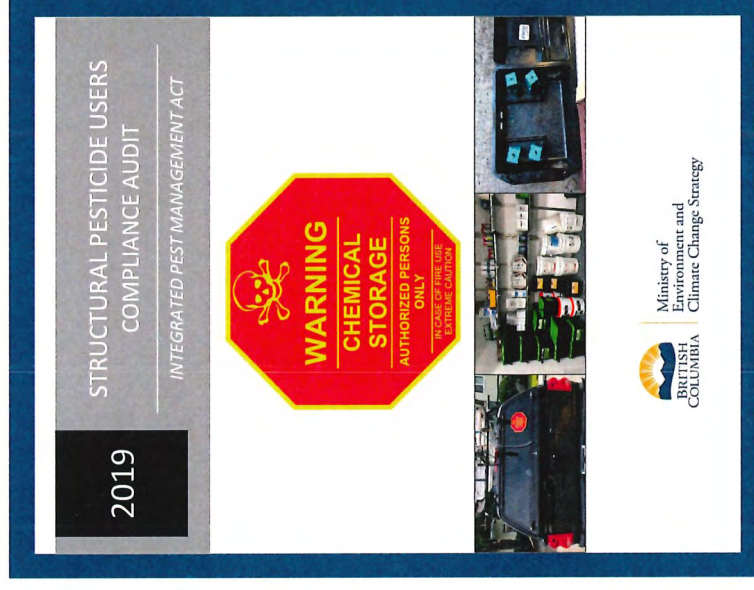
<http://www.panna.org/blog/company-thwarts-rat-poison-rules-%E2%80%94-again>



<https://www.startribune.com/3-tips-for-getting-cats-and-dogs-and-other-pets-to-play-nice/4/>

**Approx. 10,000 reports
of rodenticide exposures
in children annually in
U.S.**

Non compliance



-83% of inspected PCO's were NOT in compliance

-64% of the inspected users did not comply with the requirements to practice integrated pest management

-81% were non-compliant for pesticide record keeping



Abandoned Boxes

Not being used as a last resort



Bait boxes end up
being **PERMANENT**
by **NOT** dealing with
the problem

Boxes are not
tamper resistant



RAT POISON DISCARDED IN HOUSEHOLD GARBAGE



[This Photo](#) by Unknown Author is licensed under [CC BY](#)

Data Collection is Problematic

- Few raptors are found
- Of the ones found people don't know they should report it
- Most dead animals are buried or tossed in the garbage
- Submitted to museums and taxidermists-going untested
- Difficulty finding out who to report it to
- Due to lack of communication are told to bury it or place in garbage
- Not all raptors necropsied are screened for rodenticides-even if suspected and evidence of internal bleeding
- Canada not testing other animals, therefore, I had to use statistics from other Countries
- Barriers to lab testing

VENDORS ARE **REPEATEDLY** NON COMPLIANT

2018

IPM COMPLIANCE INSPECTION REPORT
INTEGRATED PEST MANAGEMENT ACT



Pest control companies not informing people of the dangers



“Leave it up to the highly qualified technicians “ Al Beddows-Sooke Councilor

Education?

Basically a free online course to become a certified pest control operator

- 3 online modules and an exam

Ineffective long term

- Rats have a gene that enables them to develop resistance to poison
- Clearing a resident population simply makes space for new groups to move in
- Poisoned rats mate faster to compensate for thinning numbers
- By distracting from the root of the problem, for example accessible food and shelter, relying on rodenticides permits infestations to rebound
- Making the rodent problem worse by killing rodent predators

One owl eats **1000** rodents per year



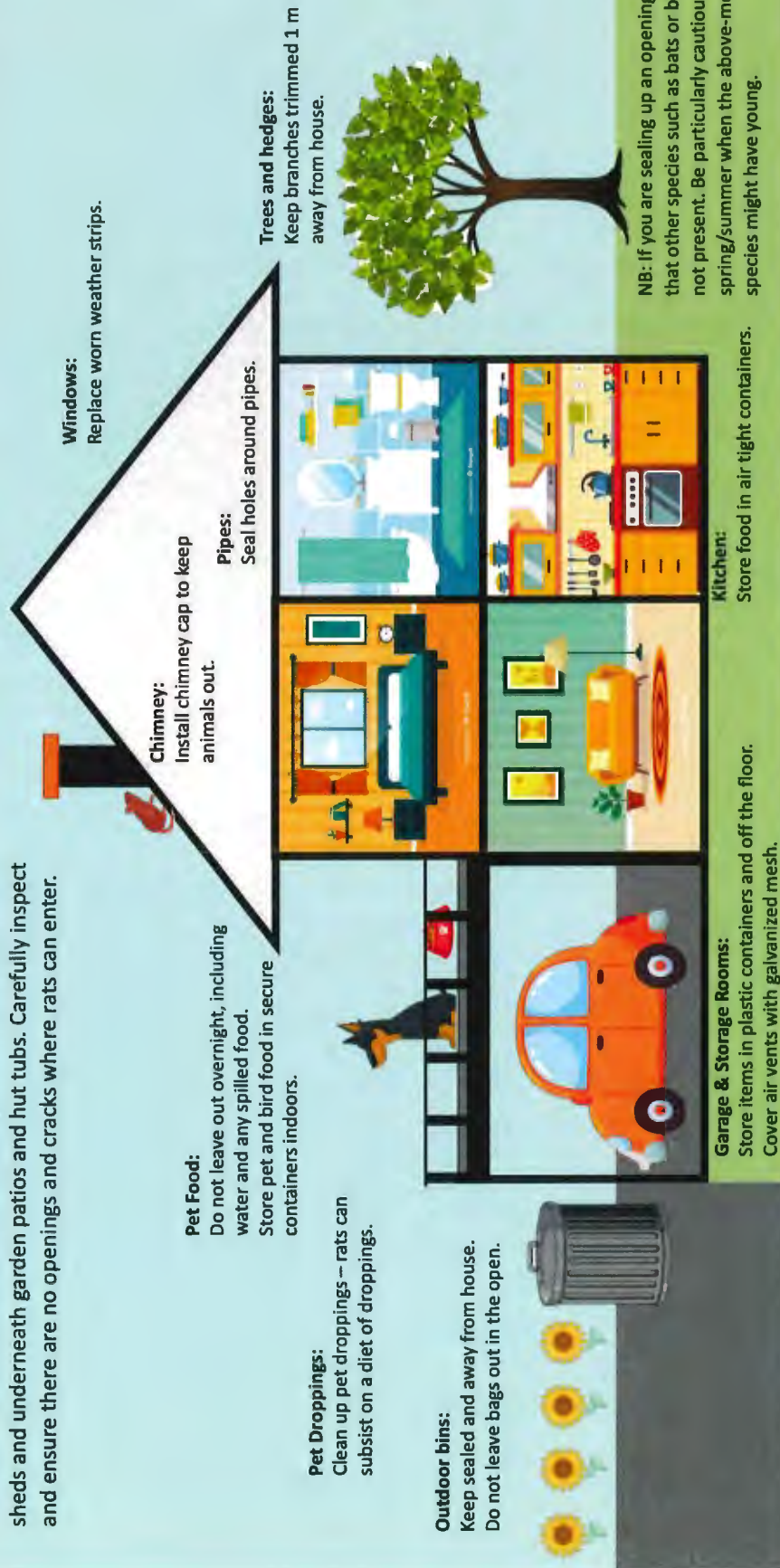
Grasses

Rodents

Owls

Rat Management: Simple Preventative Measures

Prevent access to all favourable rat nesting areas such as buildings, sheds and underneath garden patios and hut tubs. Carefully inspect and ensure there are no openings and cracks where rats can enter.



Rat Management: Simple Preventative Measures



Birdfeeders:

Do not feed on the ground; restrict your feeding to rodent-proof hanging feeders.

Rats are nocturnal so take bird feeders in at night and rake up fallen seed from the ground.

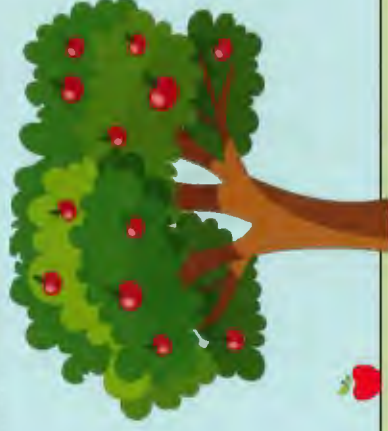
Buy quality over quantity:

Offer food that leaves minimal waste: i.e. peanut granules, sunflower hearts.

Use a seed catcher to keep spilled seed from reaching the ground.

Fruit Trees:

Pick up fruit that falls to the ground and don't let garden produce rot on the vine.



Prevent access to fruit and compost:
Don't put food in open compost piles; instead use a rat-proof composter or a covered worm box.

Compost bins:

Place bins on concrete/stone surfaces or place 1/2" metal wire mesh under all compost and storage bins to block rodents.



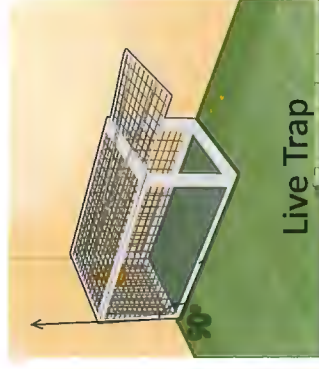
If burying food scraps, cover them with at least 8 inches of soil and don't leave any garbage above ground in the area—including a smelly shovel.

Prevent access to food and water: Store food and garbage in sealed heavy-duty containers.

Safe and effective rodent control



Peppermint oil is a natural repellant for rodents



Put snap trap in box to avoid accidental injury to pets and other wildlife



Install Owl Nesting Boxes



RODENT SOLUTIONS

Humane Solutions is Western Canada's leader in humane wildlife and pest control. We provide permanent, poison-free alternatives for our clients in an environmentally degradative industry.

WHY WE DON'T USE POISON:

- ① Ineffective & inhumane
- ① No opportunity for data collection
- ① Never achieves permanent result
- ① Toxin bioaccumulation in wildlife
- ① Risk to people & pets
- ① Secondary poisoning of predators & birds of prey



PERMANENTLY RAT FREE:



Onsite Assessment & Quote

A specialist will conduct a full inspection of your property, determining the required program to effectively manage rodent populations, as well as any required resource mitigation. Quotes are free.

Resource Mitigation

Our techs inspect every square inch of your structure and pest-proof active and potential accesses to stop the flow of rodents into your structure. We offer industry-leading warranties on all structural work. Available food and attractants are also identified and mitigated.



Targeted Implementation

We install our innovative trapping stations and remove any poison if it is present. We focus the traps on targeted locations and create data tables with trap IDs, catch metrics & sites of hot spot activity. As all our traps are within secure, no-sight stations & we use our own proprietary bait, there is no risk to children or pets.



- No poison
- Ability to collect data
- Effective & humane
- Pest proof active and potential accesses
- Industry leading warranties on all structural work
- Quotes are free
- Innovative trapping stations
- No risk to children or pets

Good Nature traps



https://cdn.shopify.com/s/files/1/0027/1613/9581/t/10/assets/spo_banner.jpeg?v=1587023853



SMIFF SNIFF

KAPUWI

AUTO-RESET

SMIFF SNIFF...

SCAMWEEED

<https://www.pinterest.ca/pin/129689664257808581/>

What can municipal governments do?

Join a growing list of municipalities that have committed to a ban of rodenticides





A dead owl found on grass in Oak Bay. Photo: Victoria News. Photo: Victoria News. Photo: Victoria News.

Oak Bay join Saanich in municipal ban of rat poison
Ban on commercial rat poisons implemented due to owl deaths

- City of Victoria
- District of Oak Bay
- Town of View Royal
- City of New Westminster





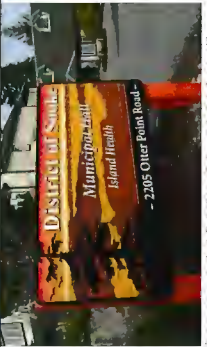
A dead owl found on grass in Oak Bay. Photo: Victoria News. Photo: Victoria News. Photo: Victoria News.

Saanich bans municipal rodenticide use after owl deaths
District unanimously approves ban and community education

NINA GROSSMAN / JUL 14, 2020 11:10 AM / LOCAL NEWS / NEWS

- City of Port Moody
- District of Sooke
- City of North Vancouver
- City of West Vancouver





Sooke jumps on board to ban use of rat poison
City staff will educate residents on harmful effects of rodenticides

SOOKE NEWS STAFF / SEP 18, 2020 7:50 AM / LOCAL NEWS / NEWS

- District of North Vancouver
- District of Saanich
- District of North Saanich
- City of Colwood



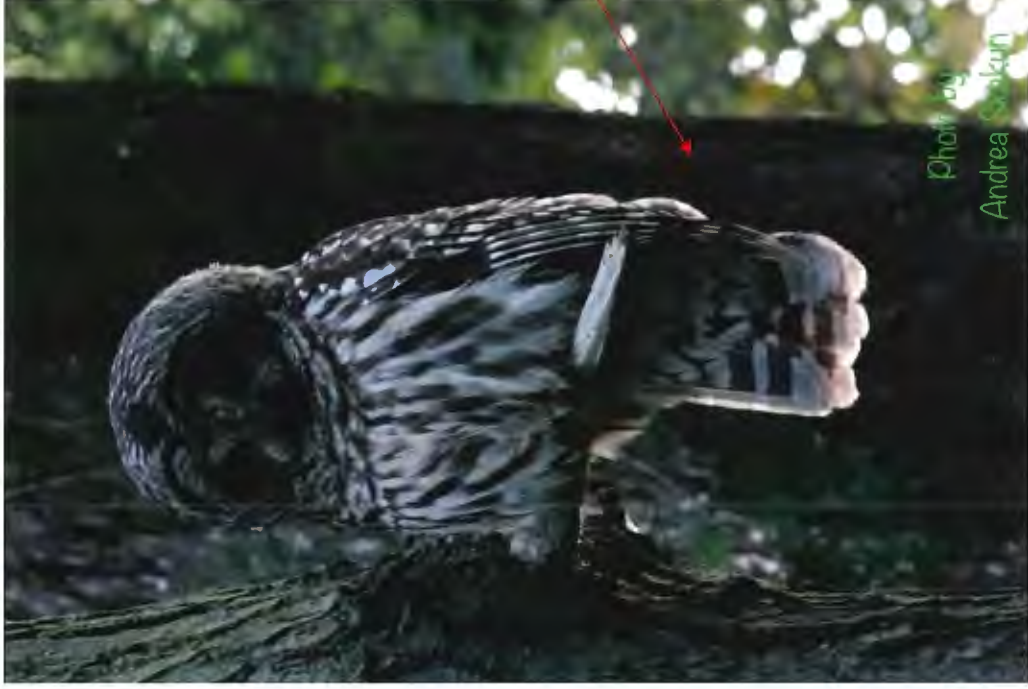
Sep 29, 2020 11:35 AM By: Theresa McManus



New Westminster is the latest municipality to back a ban on anticoagulant rodenticides because of their negative impacts on wildlife. Council approved a motion by Coun.

Fun Fact:

Barred Owls
have hearts on
their feathers



Thank you!