

HOUSE MOUSE [EXPOSED]

Chelle Hartzler, BCE



2
ip

Time to take the bait



What do you think is the most challenging aspect of baiting
82 responses



2
1
5
2
50
ip



What affects baiting?

- Sanitation (including habitat)
- Parents
- Curiosity



Mice in winter

- Breeding in winter - average 5.83 pups
- Forming communal nests
- Normal breeding all winter

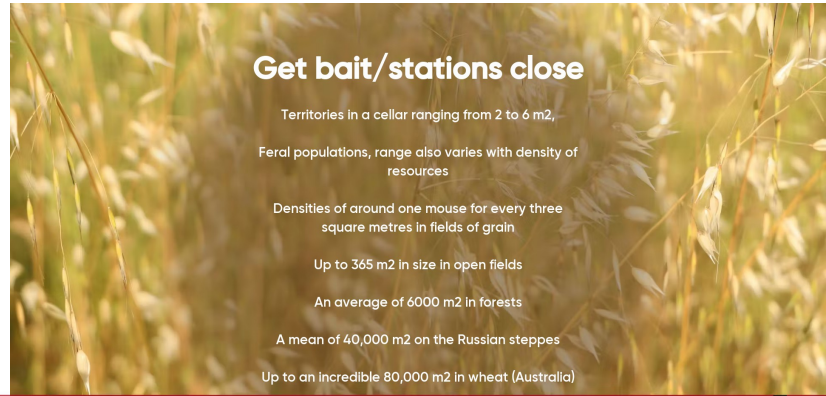
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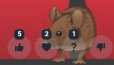
Refresher:

- Males mark (RUP)
- Vegetation = good habitat
- Smells
- "Safety"



Get bait/stations close

- Territories in a cellar ranging from 2 to 6 m²,
- Feral populations, range also varies with density of resources
- Densities of around one mouse for every three square metres in fields of grain
- Up to 365 m² in size in open fields
- An average of 6000 m² in forests
- A mean of 40,000 m² on the Russian steppes
- Up to an incredible 80,000 m² in wheat (Australia)



To clean or not to clean...again



Food

- Preferred fat over carbs
- Foods they are already eating
- When they are hungry
- Motivation for food decreases with age.

Mice also learn - the longer they are inside, the more they can find their food and harborage fast.

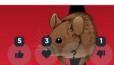


Table 2
Treatment means by category for male and female house mice in a radial arm maze.

Treatment	n	Arm entries		Box entries		Time (min)	
		Mean	SE	Mean	SE	Mean	SE
Dea box	40	11.7	0.65	47.7	2.73	3.0	0.11
Urine and feces	40	6.5	0.47	14.2	1.23	1.2	0.08
Empty	40	6.0	0.39	9.0	0.90	0.8	0.05
Water	40	6.0	0.42	5.1	1.62	0.7	0.05
Hub	40	NA*	NA	NA	NA	NA	0.12
Animal foods	40	7.5	0.37	14.5	1.88	1.3	0.10
Cheese	10	8.8	0.77	14.5	1.73	1.7	0.18
Bacon grease	10	8.3	0.76	18.3	1.27	1.7	0.18
Tuna fish	10	6.5	0.72	14.4	2.81	1.1	0.14
Dog chow	10	6.2	0.36	10.9	2.12	0.9	0.14
Plant foods	80	8.0	0.34	12.6	0.85	1.4	0.09
Almond extract	10	9.3	0.94	10.6	1.38	1.6	0.18
Peanut butter	10	9.0	0.68	17.0	4.31	2.2	0.47
Fresh banana	10	8.7	1.05	13.9	2.40	1.5	0.17
Lemon extract	10	7.8	1.40	9.8	1.88	1.0	0.19
Anise scent	10	7.7	0.98	11.2	2.03	1.2	0.12
Fresh apple	10	7.5	0.93	11.0	2.29	1.4	0.21
Melon extract	10	7.2	0.84	10.4	1.57	0.9	0.10
Mussels sprouts	10	6.5	0.76	16.7	1.73	1.6	0.16
Rodenticide baits	20	7.0	0.71	12.7	1.92	1.2	0.12
Brodifacoum pellets	10	7.8	1.14	12.4	1.77	1.3	0.14
Diphacinone pellets	10	6.3	0.87	13.0	3.52	1.0	0.18
Non-categorized ^b							
Rodent chow	10	6.6	0.69	12.7	3.38	1.0	0.22
Fatty acid scent	10	6.4	0.95	8.3	2.17	0.8	0.12

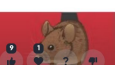
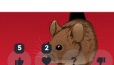
* NA, not applicable.
^b Rodent chow and fatty acid scent were not deemed appropriate to combine into any category because they were a mixture of plant and animal material.



More on curiosity/food

Mice are genetically transferring their behaviors and preferences to their offspring.

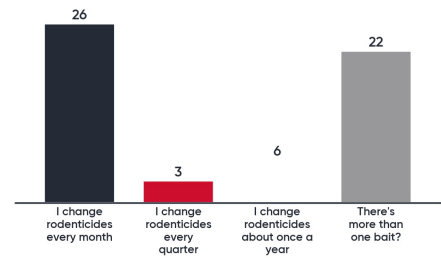
Preferences are coming from mom.



Feeding behavior

- Like taking LOTS of small meals - 200+
- Tendency towards proteins and fats.
- Mom's diet plays a big role in kids.
- New foods will be "cautious" until they can be proven safe.

Baiting



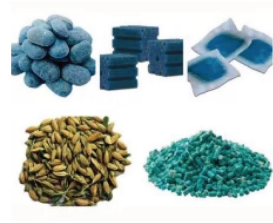
Why don't we rotate?

- We rotate cockroach, ant baits
- Why don't we do it more?
- Is resistance real? (yes)
- And aversion?
- How often, really, should we rotate?



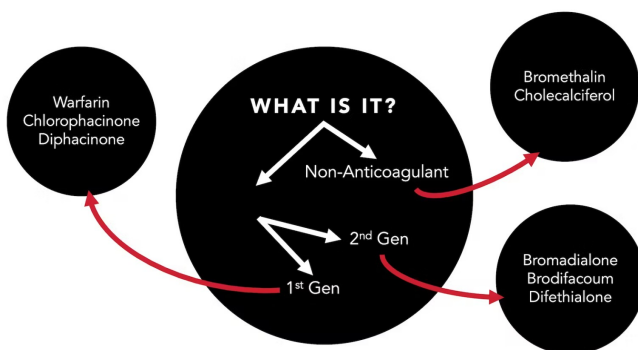
Rotate ACTIVE INGREDIENTS!!! - How many AI's do we have currently?

0 ————— 8 ————— 10



Resistance - it exists!

Brodifacoum
Warfarin
Bromadiolone
Difethialone
Chlorophacinone



	TIME TO DEATH	
	NO CHOICE	CHOICE
Warfarin	8.5	7.8
Bromadiolone (+fish flour)	5.8	6.5
Bromadiolone (+bone flour)	6.5	8.5
Bromadiolone (+sugar)	7.2	10.3
Difethialone (+fish flour)	7.9	6.5
Difethialone (+sugar)	5.8	7.5
Difethialone	6.9	6.8

Bait containing :	LD50 (mg/kg)	MALES				FEMALES		
		Total consumption of active substance (µg/mouse for 4 days)	Mortality (%)	Mortality interval (days)	Total consumption of active substance (µg/mouse for 4 days)	Mortality (%)	Mortality interval (days)	
Coumatetralyl	15-30	3240 (27 mg/kg/day)	20	4 to 7	3559 (31.8 mg/kg/day)	0	-	
Chlorophacinone	3.15	574 (4.8 mg/kg/day)	50	3 to 4	844 (7.5 mg/kg/day)	0	-	
Bromadiolone	1.75	639 (5.3 mg/kg/day)	60	4 to 7	501 (4.5 mg/kg/day)	0	-	
Difencoum	0.8	453 (3.8 mg/kg/day)	100	4 to 7	618 (5.5 mg/kg/day)	80	7 to 14	
Difethialone	1.9	237 (1.9 mg/kg/day)	100	4 to 7	294 (2.6 mg/kg/day)	100	7 to 14	
Brodifacoum	0.4	333 (2.8 mg/kg/day)	100	4 to 9	471 (4.2 mg/kg/day)	100	7 to 11	
Flocoumafen	0.54	930 (7.8 mg/kg/day)	100	4 to 10	904 (8.1 mg/kg/day)	100	7 to 14	

Table 1: Consumption of active substance and mortality of house mice homozygous for *Vlcrrc1tm* genotype during a no-choice feeding test with various AVKs.



How many blocks can you use for house mice?

0 — 2 — 15

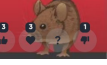
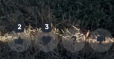


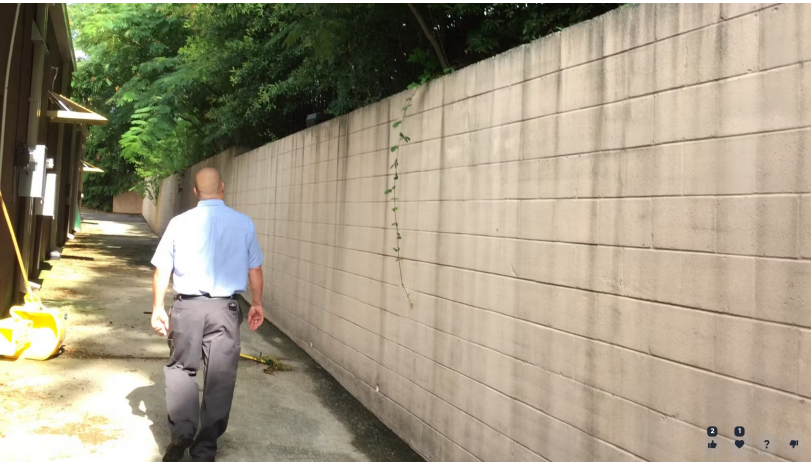
Come to the dark side



Galapagos island study

- Mouse traps did not initially catch any mice.
- Mice were trapped in increasing numbers only after the rat catch-rate had declined substantially.
- Mice were present but their activity and/or numbers were being suppressed by the larger rodent.



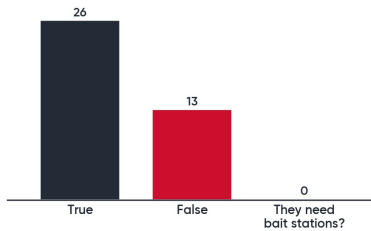


Don't forget about smells

- Human smells are bad
- Male smells will deter males
- "Excessive cleaning of scented bait stations may decrease the efficacy of rodenticide baiting."



Bait stations need to be spaced at regular intervals, particularly for audited accounts



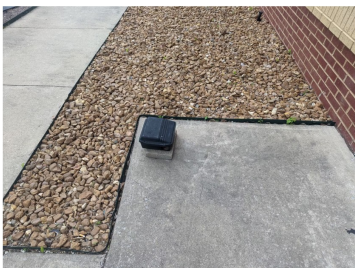
Bait stations or other rodent monitoring or control devices shall be appropriately located and maintained.

— BRC



Where should we put them then???

- Find the food
- Dark spaces
- Warm spots
- How will they get there?



The EPA and Rodenticides

- Changes are coming
- RUP
- Additional PPE
- Carcass searches
- More paperwork



Bald eagle believed to have ingested rodenticide in Arlington dies

Why is this happening?

- Misuse
- California started it
- Secondary poisoning
- Lack of education
- Special interest groups

Crime & Safety

Pittsburgh-Area Hotel Rat Poison-Related Evacuation: Latest Info

Seven people were taken to the hospital Monday after being exposed to a gas created by a rodenticide.

Eric Heyl, Patch Staff

Posted Tue, Sep 26, 2023 at 7:45 am ET | Updated Tue, Sep 26, 2023 at 10:42 am ET

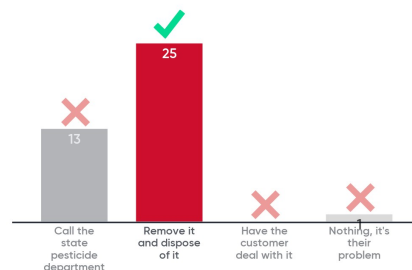
Reply

What it will mean:

- More visits (\$)
- More traps (\$\$)
- Extra training (\$\$\$)
- More rodents
- More misuse?



Illegal DIY baiting - what do you do?



Main take-aways

- Looking for safety
- They do have food preferences
- Food has to be deemed "safe"
- Rodenticide take a while to work
- Territories based on resources