

Skabra 2023

envu™ Professional
Pest Management





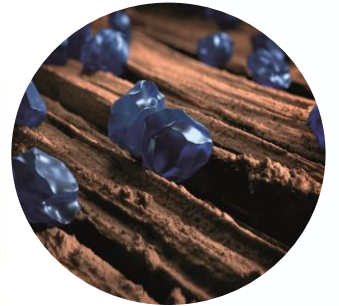
Agenda

- Insects
- IPM
- The new Racumin Expert
- TRUDET_X

Insect



Insecticides



Rodenticider



Product Positioning

- Primary poisoning risk



- Low to medium infestation:



↔
En rotation



- High infestation:



- Food processing industry:



- Sensitive external use:



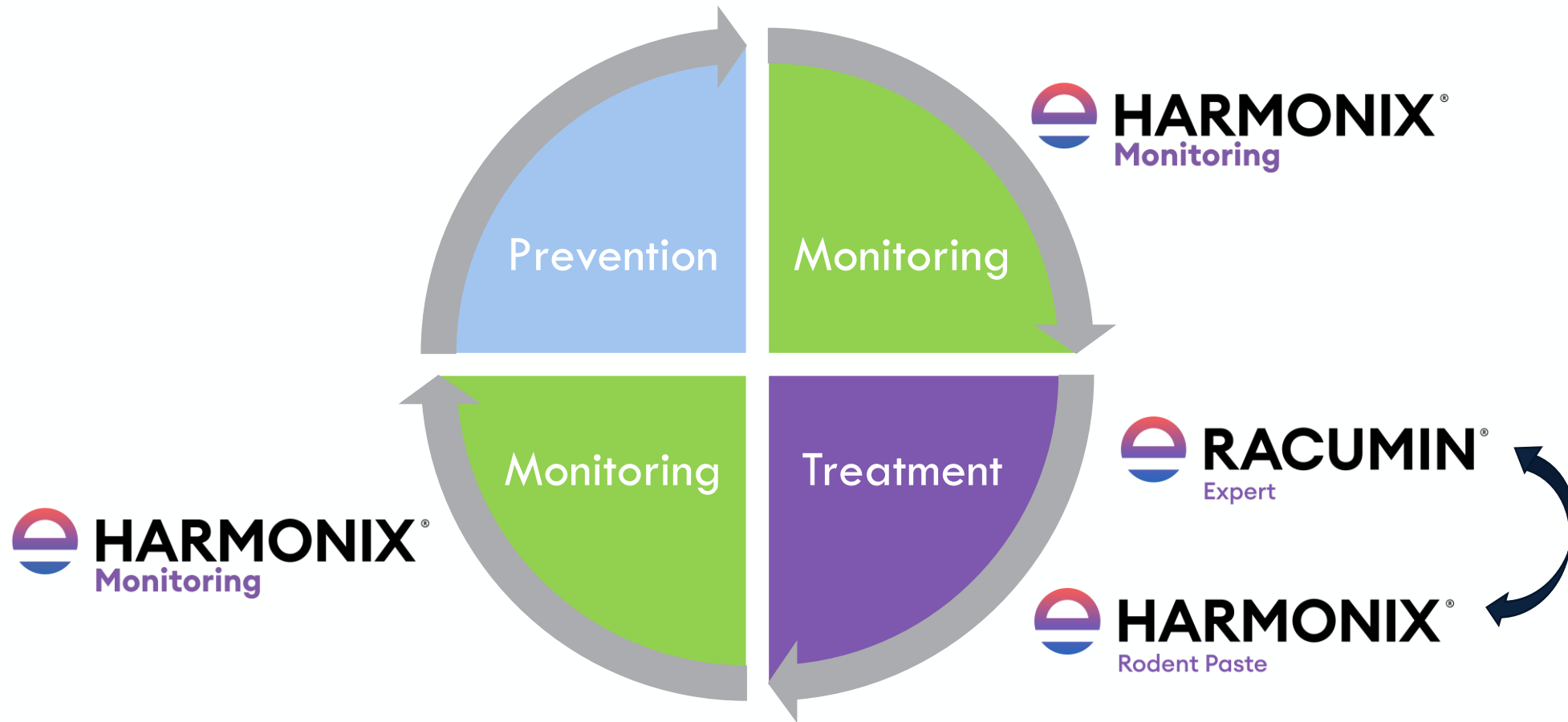
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- Voles:



IPM Program : Integrated Pest management



Racumin® Foam

Foam formulation that fights rats without bait.

The soft foam sticks to the fur of the animals and is consumed when the animals clean the fur.

The foam is stable for up to 12 -14 days but is active longer.

Racumin® Foam can be used as a supplement to all types of control. Especially suitable where the rats reject the food poison.

Used for pipe penetrations, cavities and other small spaces

The foam collapses after approx. 2 weeks

Up to 50 applications per bottle.

Contains: Coumatetralyl 0.4% – contains Bitrex®, a bitter substance that prevents ingestion by humans and pets.



Harmonix® Rodent Paste

- Harmonix® Rodent Paste newly developed unique non anticoagulant.
- Approved for the control of brown rats (*Rattus norvegicus*), house rats (*Rattus rattus*) and mice (*Mus musculus*).
- Harmonix® Rodent Paste is based on vegetable oils and is very attractive to rats and mice.
- Harmonix® Rodent Paste can be used in all environments content: Cholecalciferol 0.077%.
- Lightweight packaging with zip closure, contents 250x20g, (5 kg).
- Reduced plastic consumption of up to 80%.
- Can be used when resistance to anticoagulants has been established.

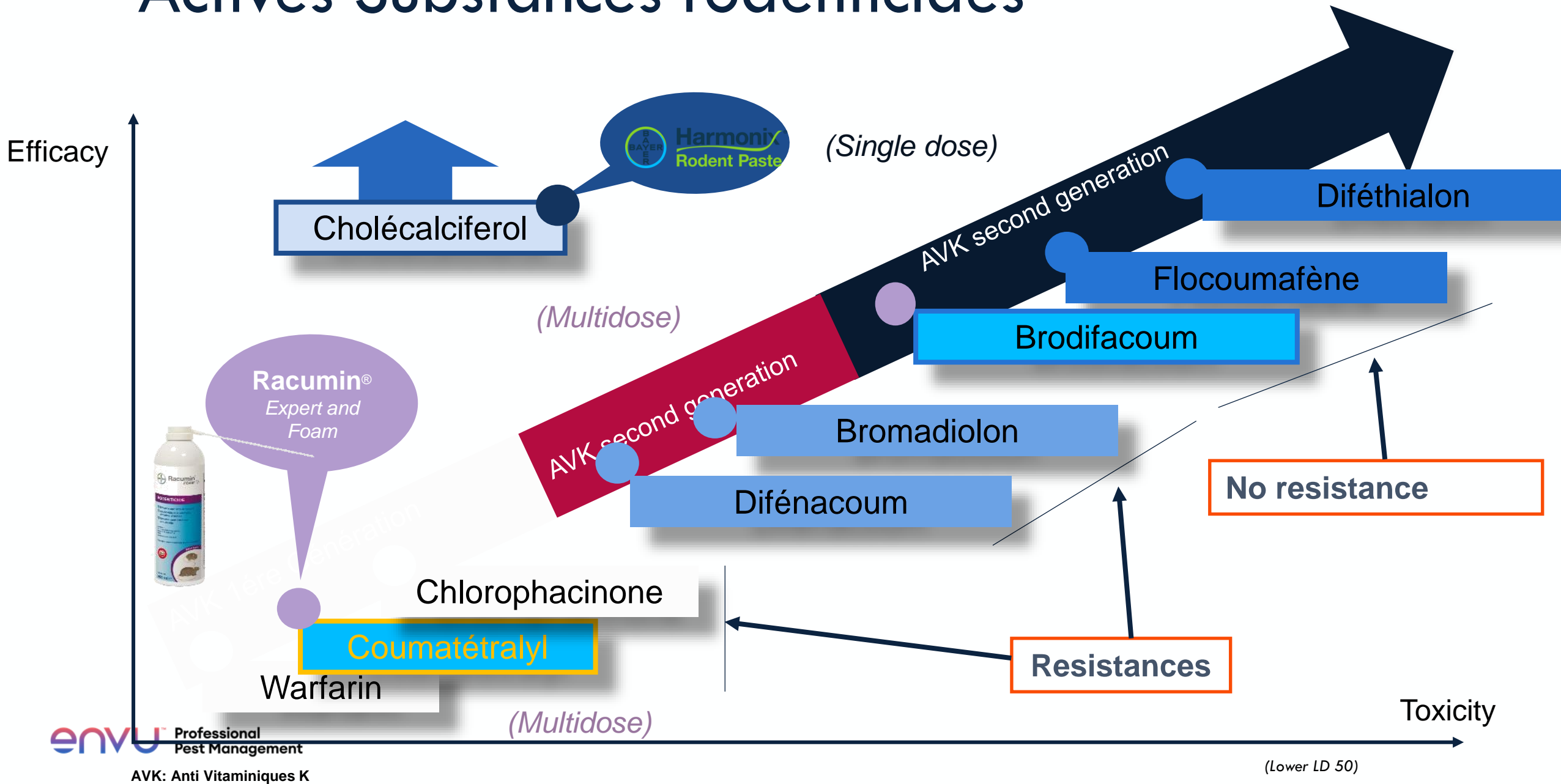


Racumin Expert

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Actives Substances rodenticides



RACUMIN Expert

(Coumatetralyl 27 mg/kg)

Efficacy Profile

The anticoagulant rodenticide coumatetralyl was introduced under the brand RACUMIN 57 by BAYER in 1957. The first product globally launched was a tracking powder, containing the active compound at 0.75%. The concentration was adjusted just to provide sufficient active compound to the main target species, the Norway rat, in shortest time. **To extend the use of coumatetralyl to baits, the powder was mixed with grains at a 1/20 ratio. This ratio was chosen because the mixing ratio was easy to handle in practice,** and the resulting concentration in bait, 0.0375%, was proven very effective in Norway rats and other rat species.

Efficacy – Intro

The period of ingestion is the main determinant of coumatetralyl's action rather than the ingested dose. Therefore, coumatetralyl, like warfarin, is called a “multiple dose anticoagulant” in contrast to those compounds of the second generation, which do not show this characteristic, and therefore are called “single dose anticoagulants”.

The common concentration of coumatetralyl in baits for rats and mice was adjusted at 375 mg/kg in order to achieve sufficient efficacy in house mice and also after single ingestions of bait by rats. On the other hand, it was proven that reduced concentrations in bait, as low as 6 mg/kg, are effective in Norway rats, provided the bait was ingested over a few days (Tammes et al., 1967).

The studies introduced in this summary shall provide the proof of efficacy of bait containing coumatetralyl within a range at 25 mg/kg to 30 mg/kg in Norway rats and two vole species.

EFFICACY in Norway Rats

- All anticoagulant rodenticides show a **delayed action**, with death occurring 4 to 8 days after starting bait consumption. Under practical conditions (and even in laboratory trials) many rodents only start eating the bait after a few days and with varying daily quantities. It is, therefore, necessary to provide bait for weeks rather than days and to replenish bait irrespective of the active compound used.
- In Consequently, using compounds with high acute toxicity (and with long residual time) results in multiple lethal doses ingested by a proportion of the rodents to be controlled, which may have implications on ecological assessments. Potential secondary poisoning in raptors, predators, and owls is the main risk when using second-generation anticoagulant rodenticides (SGARs) because their toxic residues are very slowly metabolized and accumulate in exposed wildlife.

Avk first and second generation

Lethale Dose 50 - Rat

	DOSE OF ACTIVE SUBSTANCE. SINGLE INGESTION	DOSE OF ACTIVE SUBSTANCE. MULTIPLE INGESTION
Coumatetralyl	30 mg/kg	5 x 0,3 mg/kg
Bromadiolon	1,1 – 1,8 mg/kg	5 x 0,1 mg/kg
Difenacoum	1,8 mg/kg	5 x 0,15 mg/kg
Brodifacoum	0,22 – 0,27 mg/kg	5 x 0,05-0,08 mg/kg

Table 2: Oral LD₅₀ of coumatetralyl, approximation for **bait** containing coumatetralyl at 27 mg/kg compared to 375 mg/kg in a 250 g bodyweight Norway rat (*Rattus norvegicus*)

Bait, a.i. in %		<u>250g rat LD₅₀, oral</u>	
		Acute (gram bait)	Multiple Dose (days x gram bait)
Coumatetralyl	0.0027	82 – 179	5 x 2.8 = 14 g
Coumatetralyl	0.0375	6 – 13	5 x 0.3 = 1.5 g

Nouvelle formulation pâte à base de coumatétralyl en 27PPM



The new expert against **rats** and **voles** in 27 ppm

- **Coumatetralyl: First generation active substance**
 - Multi dose: Multiple ingestions required
 - Ensure consumption for 3 to 5 days
 - 20g sachets
- **New formulation with high palatability**
 - Mixture of cereals, sugars, oils
- **Excellent efficiency on:**
 - **Rats** (*Rattus norvegicus*, *Rattus rattus*)
 - **voles** (*Microtus arvalis*, *Myodes glaerolus*)
 - **(Mouse use under pending approval)**
- **Active substance supported at European level for biocide renewals**



- Rats: Brown rats (*Rattus norvegicus*)
- Voles: Bank voles (*Myodes glareolus*), Field voles (*Microtus arvalis*)
- Use period: all year round
- Application method: Ready to use bait , to be used in tamper bait station



Target	Bait quantity / bait station	Bait quantity / depending on infestation level	Distance between the baits points*
Rats	60 to 200 gr	Low infestation: 100gr	Minimum 5 mt
		High infestation: 200gr	
Voles	20 gr	20 gr	20 gr

Outdoor Open Area Voles/Landfills and Waste Areas: Apply 1-3 times in 10 days after finding infestation

Racumin Expert effective on Rats



- Racumin Expert 27 ppm: need for 1 additional day of consumption on Rats VS 375 ppm formulation
- On Rat, Racumin Expert allows to control within almost 6 days after consumption instead of 5 days with the current formulation 375 ppm.
- It is better accepted by rodents because less active substance (appetite)
- Detection of the active substance by rodents at 375 ppm (especially for mice) thus reducing appetite for Racumin Paste compared to Racumin Expert.
- Lower level of Active substance increase the palatability and the pasta intake/consumption.
- Racumin Expert must be applied only on susceptible rodent rodents.

Voles

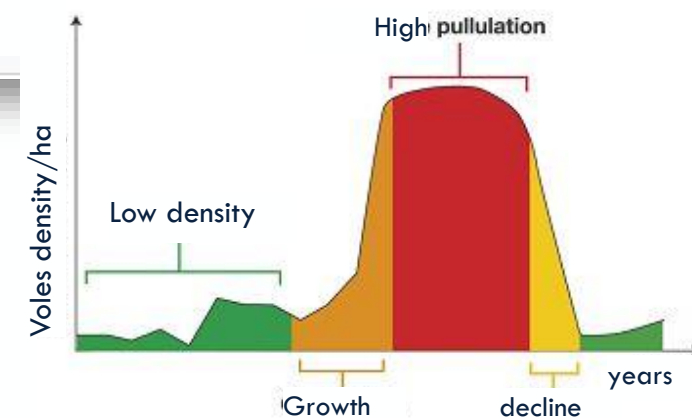


- Voles frequent open areas such as hedges and burrows (many galleries)
- Highly fluctuating populations: sporadic presence at high density
- In the presence of pullulation: Problems of damage in crops and meadows
- Spread of diseases
- I.e., Field Vole:
 - Stocky and rounded body
 - Tail shorter or equal to body length
 - Adult age: 9-13 cm (head + body)
 - Tail 3 to 4.5 cm
 - Weight from 18 to 50 g
- 3 to 6 litters annually from 4 to 5 young/ female
- Feeds on herbaceous plants and seeds
- Peak density every 5-6 years: last peak in Europe in 2015-2016...



The vole tail is really shorter than the mouse one's

Next peak ?



Control of voles



Why ? :

- The bank vole (*M. glareolis*) is the main vector of hantavirus (genotype Puumala)
- Hantavirus are viruses found in some rodents, such as the rusty voles living in forests and sometimes in nearby buildings
- Rodents develop an inapparent infection and shed the virus in large quantities in their urine, feces or saliva
- Humans may develop hantavirus infection by inhaling airborne saliva or urine droplets, or fecal dust from infected wild rodents
- Hemorrhagic fever with renal syndrome (SRHR) = most often benign, sometimes asymptomatic infection, but which may in some cases lead to serious clinical signs, including kidney disease.

Racumin Expert VS Racumin Paste

	Racumin Expert	Racumin Pâte
Concentration	27ppm	375ppm
Classification	No	CMR
Format: sachet	250 sachets x 20g bucket Flexbag	50x 100g Seau
Use	Rats, Voles	Rats, Mice
Application	Interior, exterior around buildings, Areas ext. (burrows)	Interior, exterior around buildings
Efficacy	In rats, Racumin Expert 27 ppm requires 1 Day of additional consumption or 6 Days instead of 5 VS the formulation 375 ppm	
Bitter agent	yes	yes
Formulation	Mixture of cereals, sugars and vegetable oils with (formulation improved over the years)	
	New formulation + less A.S. -> Increased palatability	Excellent palatability
Risk of poisoning	Primary and secondary poisoning reduced VS Racumin Paste (concentration s.a. lower)	Primary and secondary poisoning reduced VS AVK 2nd generation

Efficacy Review

Coumatetralyl:	375 ppm	27 ppm
Norway rat	+	+
Norway rat, resistant	-	-
Black rat	+	-
House mouse	+	+
House mouse, resistant	-	-
Bank vole	+	+
Water vole	+	+

- Registered only for Voles: Bank voles (*Myodes glareolus*), Field voles (*Microtus arvalis*)

SUMMARY

- The period of ingestion is the main determinant of the FGAR coumatetralyl's action, rather than the ingested dose in rats. Efficacy is time-dependent over dose-dependent. "Multiple Dose Anticoagulant".
- SGARs do not show this characteristic, "Single Dose Anticoagulants".
- Common concentration of coumatetralyl in baits for rats and mice was adjusted at 375 mg/kg to achieve sufficient efficacy in house mice, and also after single ingestions of bait by rats.
- On the other hand, it was proven that reduced concentrations in bait, as low as 6 mg/kg, are effective in Norway rats, provided the bait was ingested over a few days (Tammes et al., 1967).
- Coumatetralyl is an effective compound in the control of Norway rats. With bait containing a high concentration of the bait, a lethal dose can be delivered within one day feeding. With very low concentrations, a lethal dose is delivered by low daily amounts of bait taken on succeeding days.

DECISION TREE

Main baits type

Rat and mice

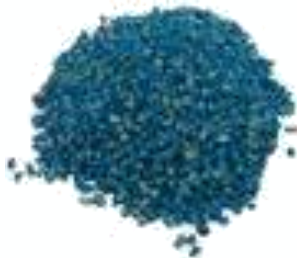
Blocks



Paste



Wheat grain



Oat + Wheat grain



What should be taken into consideration to choose the rodenticide?

- Formulation
- Type of bait and environment conditions
- Baiting technics
- Type of infestation
- A.I. choice



Formulation choice

Rattus norvegicus

	Palatability	Heat Stability	Humidity stability	Handling	Monitoring
Scale 1 : very poor 5 : very good	Common understanding within the Pest Controller community	Resistance to modification due to heat (fat release, germination)	Resistance to modifications due to high humidity (mould, structure, germination)	Easy to fix, less spillage risk	Quantity of product eaten give an assessment of the infestation
Grains	5	4	3	1	1
Wax blocks	3	5	4 – 5 According to block formulation	5	5
Paste	4	3	3	4	5
Soft bait	2	2 ?	3 ?	2 Grooming effect	1



Formulation choice

Mus musculus

	Palatability	Heat Stability	Humidity stability	Handling	Monitoring
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Wax blocks	3	5	4 – 5 According to block formulation	5	5
Paste	4	3	3	4	5
Soft bait	3	2	3	2	1





TRUDETTMX

Bed Bug Rapid Test

« The very first scientifically proven tool to detect Bed bugs infestation in less than 5 min with 92% accuracy for everyone, everywhere and at anytime »

Product Overview

New Bed Bug Detection Device

- Bed bug detection device
 - Collection swab
 - Reader
- The test is a simple lateral flow strip and works exactly like a COVID-19 self-test
- 92% accuracy rate
- Result within 5min
- Patented & exclusive



A photograph showing three dead rats lying on a dark, textured asphalt surface. The rats are brown and grey, with long tails. They are positioned diagonally across the frame. The word "Questions" is overlaid in large white text at the bottom center.

Questions