SECTION 1 PRODUCT AND COMPANY INFORMATION

Manufacturer: Johnster Inc. – 37991 Sparrow Rd., Gunnison, CO 81230
Product Family: U.S. EPA Exempt rodenticide
Product Name: No-Ratz ™

SECTION 2 - COMPOSITION/INFORMATION ON INGREDIENTS

Product may contain some, or all, of the following extracts and ingredients processed from natural sources:

Component (CAS Number*)

Sodium Bicarbonate (144-55-8)
Sodium Chloride (7647-14-5)
Sucrose (57-50-1)
Potatoes (9005-25-8)

SECTION 3 – SCOPE

The scope of this report is to describe the efficacy of a new non-toxic all-natural rodenticide in controlling rodent populations called No-Ratz™.

SECTION 4 – Testing Details

Testing scientific background:

Part 1 Chemical reaction baking soda with hydrochloric acid

The formula is based on the chemistry of mixing baking soda with stomach acid. The chemical reaction formula resulting from mixing baking soda with stomach acid is:

$NaHCO3 + HCl \rightarrow NaCl + H2O + CO2(g)$

Where:

- $NaHCO3$ is baking soda (sodium bicarbonate)
- HCl is stomach acid (hydrochloric acid)
- $NaCl$ is table salt (sodium chloride)
- $H2O$ is water
- $CO2$ is carbon dioxide gas

This reaction is a neutralization reaction, which means that a base (baking soda) reacts with an acid (stomach acid) to form a salt (table salt) and water. The carbon-dioxide gas is produced as a byproduct of the reaction.

Volumetric Expansion due to baking soda stomach acid reaction: 100%

The exact volumetric expansion percent will vary depending on the starting concentrations of the reactants and the temperature of the solution. However, in general, the volumetric expansion percent is expected to be around 100%. It is important to note that the volumetric expansion of the reaction creates extreme bloating within the rodent stomach which cannot be released due to rodent anatomy. The gas produced can build up pressure and even cause an explosion in a closed container.

Part 2 Dry mashed potatoes and water: 20%

The expected volumetric expansion of adding one part water to one-part mashed dry potatoes containing no water and stirring to create a smooth slurry mixture is approximately 20%. This means that the volume of the mixture will increase by 20% after the water is added.

The dry mashed potatoes are made up of starch granules that are tightly packed together. The chemical reaction creates water which the starch granules absorb and swell. This causes the volume of the mixture to increase.

Total expansion of No-Ratz formula: 120%

The rodent takes in water after consuming the dry ingredients leading to additional expansion of the consumed product. Water consumption along with stomach acid together will result in more than doubling the volume of stomach contents.

This bloating causes the rodent stomach to rupture briefly after consuming the water and leads to speedy rodent extermination.

Testing

No-Ratz™ was tested in a natural setting using a variety of rodent species, such as mice and rats. No-Ratz™ was tested in a variety of different settings around buildings, including high traffic areas such as front deck and low traffic areas such as back decks.

The date of the study

A period following the end of the cold season starting in early June is the beginning of heavy rodent activity in the test area. Packrats, field mice, and house mice become extremely active during this time and are attracted to building structures during their nightly foraging for food and social behavior. This activity drops sharply with the arrival of snow in early November. As a result, the best times to test are during the more moderate seasons:

First study – June 2021 through October 2021
Second study – June 2022 through October 2022

The location of the study

Forty-acre wooded area located at Johnster Inc. facilities 37991
Sparrow Rd.
Gunnison CO
81230

The species of rodents that were tested:

Packrats, field mice, house mice.

No-Ratz dosage:

SYNERGESTIC BLEND
ACTIVE INGREDIENT:
DEHYDRATED MASHED POTATOES . . 88%
SODIUM BICARBONATE 10%
SODIUM CHLORIDE 1%
INERT INGREDIENT:
SUCROSE 1%
TOTAL 100%
This Product is exempt from registration with the U.S. Env. Protection Agency

This is the same dosage as being manufactured by Johnster Inc. for retail and targeted for sale in the continental US.

SECTION 5 – Material and Methods

Materials

No-Ratz™ was used for testing efficacy of product. As a control test a commercially available gluten-based rodenticide product was also used. The material was presented in a natural setting where the rodents were found to be loitering. Bating stations like the production version of baiting stations was used to place the product for testing.

Site Selection

For a period of four years prior to the test, the areas where the rodent activity was observed were confirmed to be the best place for performing the testing. Confirmation was based on the rodents being observed loitering and overnight droppings:

Active Area Selection

The front deck area - This area is frequently used numerous times daily by the residents during the day facing the main entry door. It also happens to be frequently visited by rodents.

The back deck area - This area is infrequently used once or two times a week infrequently by the residents during times were going to the back yard area is necessary. It also happens to be frequently visited by rodents.

Measurements

Both mice and packrats leave behind droppings indicating their presence and numbers. Daily removal of the droppings and then observing overnight fresh droppings is an indication of the number of rodents present. A high number of droppings directly correlates with high rodent presence. No droppings over a period of several days indicates the rodents are no longer present. This method of measurement is used for assessing the presence of rodents before, during, and after the tests.

During testing, the quantity of rodenticides being consumed is a confirmation measurement of test validity indicating the rodents were taking the bait.

1. Daily droppings present / absent

Daily droppings over a period of at least two days indicate presence of ongoing rodent activity. No droppings over a period of at least three days indicates rodents are no longer present.

2. Number of droppings Heavy / Light / None

Tests are initiated whenever ongoing heavy droppings are observed. Over a period of one or two days a transition from heavy to light number of droppings indicates the rodents are being exterminated. Finally, no droppings being observed immediately after heavy rodent activity is an indication that all rodents have been exterminated.

3. Amount of bait consumed All / Some / None

Directly after test initiation some or all the baits being consumed indicates that this is a valid test. No more baits being consumed along with no signs of further rodent activity over a period of at least three days indicates the rodents have been irradicated. A daily consumption of bait indicates a valid test. If the consumption leads to no further rodent activity it indicates rodenticide consumption leading to rodent eradication.

Methods used: Rodent activity is measure over a period of several days without applying any rodenticides. Control tests were used to ensure rodent activity did not diminish by itself without using No-Ratz™. Control tests were carried out numerous times to verify results are attributable to the use of No-Ratz™ Upon confirmation of significant steady rodent presence, tests were then conducted by placing No-Ratz ™ in baiting stations at the location of rodent activity and left overnight.

The results were measured every morning to construct the below table of results.

SECTION 6 – RESULTS

Key to live rodent population density ratings:
3 – Heavy rodent presence based on the number of droppings
2 – Moderate rodent presence based on the number of droppings
1 – Little rodent presence based on the number of droppings
0 – No droppings were observed indicating no rodent presence

Tabular Data:

Efficacy Report				Date	Jun-21
Efficacy Data			Live rodents population density		
Group	Test duration [days]	Location	Start of test	End of test	% population reduction
Control	3	Front porch	3	3	0%
No-Ratz ™	3	Front porch	3	0	100%
Control - gluten based rodenticide used	5	Front porch	3	3	0%
Control – no rodenticide used	4	Back porch	3	3	0%
No-Ratz ™	3	Back porch	3	0	100%

Efficacy Report				Date	Jul-21
Efficacy Data			Live rodents population density		
Group	Test duration [days]	Location	Start of test	End of test	% population reduction
Control – no rodenticides used	3	Front porch	3	3	0%
No-Ratz ™	3	Front porch	3	0	100%
Control - gluten based rodenticide used	5	Front porch	3	3	0%
Control – no rodenticides used	4	Back porch	3	3	0%
No-Ratz ™	3	Back porch	3	0	100%

Efficacy Report			Date	Jun-22
Efficacy Data		Live rodents population density		

Group	Test duration [days]	Location	Start of test	End of test	% population reduction
Control	2	Front porch	3	3	0%
No-Ratz ™	3	Front porch	3	0	100%
Control - gluten based rodenticide used*	2	Front porch	3	3	0%
Control – no rodenticide used	3	Back porch	3	3	0%
No-Ratz ™	3	Back porch	3	0	100%

* - rodents had not touched the bait

Efficacy Report			Date	Jul-22
Efficacy Data			Live rodents population density	
Group	Test duration [days]	Location	Start of test	End of test	% population reduction
Control – no rodenticide used	3	Front porch	3	3	0%
No-Ratz ™	3	Front porch	3	0	100%
Control – no rodenticide used	4	Back porch	3	3	0%
No-Ratz ™	3	Back porch	3	0	100%

Efficacy Report			Date	Sep-22
Efficacy Data			Live rodents population density	
Group	Test duration [days]	Location	Start of test	End of test	% population reduction

Control – no rodenticide used		Front porch	3	3	0%
No-Ratz ™	3	3 Front porch	3	0	100%
Control – no rodenticide used	4	Back porch	3	3	0%
No-Ratz ™	3	Back porch	3	0	100%

Summary: The results all indicate rodents readily and immediately begin the nightly feeding on No-Ratz™. The bait was routinely consumed overnight. Along with the nightly consumption and within one or two days of the start of the test the overnight droppings were reduced from heavy, to light, to none.

The absence of rodents was always after the baits were regularly consumed for a period of one to three days.

- Rodent population reduction never took place without introducing No-Ratz ™ through out the period of the tests.
- Rodents did not take an interest in consuming the gluten based commercially available rodenticide during the tests.
- Rodents readily consumed No-Ratz ™ throughout the test period.
- Rodents continued to consume No-Ratz ™ until there were no more signs of rodent activity.
- Both rat and mice rodent populations were present and were exterminated.

SECTION 7 – Conclusions

The test results indicate No-Ratz™ presents a unique and critical opportunity to control rodent populations safely and effectively without relying upon environmentally hazardous chemicals and compounds known to impact wildlife.

- No-Ratz™ is highly effective in reducing mice and rat population.
- Rodents do not detect any warning signs that No-Ratz™ is harmful to them leading to the eradication of all the rodents visiting the test site.
- No-Ratz™ is preferred by rodents over gluten-based rodenticide products tested to date.

Based on the above the use of No-Ratz™ and its adoption will result in a drastic improvement in pest control while reducing the traditional negative environmental impact.