BASF

We create chemistry

Selontra® Soft Bait Rodenticide

An Innovative Solution for Rodent Control in Poultry Environments

Preface: *This brochure provides general information about using Selontra® Soft Bait Rodenticide to control rat and mice populations in broiler farms and layer facilities. It includes guidelines for identifying common rodent pests, steps for complete rodent control, and recommended techniques for applying Selontra along with relevant safety considerations. As an industry leader in pest management, BASF is committed to providing you with the solutions and knowledge you need to protect the health of your flock and help prevent damage to your facilities, equipment and supplies. Selontra is an innovative solution that can help your poultry farms operate more productively.*

contents

Controlling Rodents in a Challenging Environment

Each year, rodents destroy approximately 20 percent of the world's agricultural products[1], cause enormous amounts of damage to farms and live stock facilities, and spread more than 200 human pathogens[2]. With an abundance of food, water and places to harbour, egg-laying and broiler facilities are particularly attractive to rodents, which can cause significant problems. Rodents consume and contaminate feed, spread disease and damage equipment and structures. Furthermore, rodents are predators of eggs and birds.

The health of your stock, the cleanliness of your feed and the condition of your shelters are essential to your business and its profitability—but rodent infestations can threaten them all. To control rat and mouse populations, you need effective solutions you can count on.

Even a small rodent population will consume and contaminate as much as 20 tons of feed annually.

Rodents damage your facility in many ways from gnawing on electrical wires and destroying insulation.

Rodents are carriers of at least 45 diseases and 200 human pathogens.

BASF Rodent Solutions

BASF recognises the realities of modern poultry operations, which is why we deliver rodent control solutions to serve those facilities' unique needs. We understand there's no substitute for the quickest, most-effective and most-efficient control measures. We know there are numerous challenges to maintaining that control, including rats and mice that are resistant to conventional rodenticides, restrictions on the types of rodenticides that can be utilised, contamination and residue risks, and the difficulty of restricting rodents' access to animal feed throughout your facility.

Our solution is a comprehensive rodent control program tailored to help commercial poultry facility managers and pest control professionals to:

- Identify rodent activity and the conditions that increase rodent population pressure
- Select the appropriate measures that will lead to control and mitigation of rodents
- Eliminate rodents quickly and safely with lower risk of contamination and residues
- Monitor results and respond to new activity

A leader in providing sustainable solutions, BASF offers the industry's most innovative, effective and efficient solutions. We stand behind our products, and support our customers with comprehensive training and expert technical assistance. We also provide dedicated sales and technical support. When you have questions, we are available to provide answers and to help make your job easier.

1 http://removeratsrestorehawaii.org/the-threat-rodents/
2 http://www.pctonline.com/article/-annual-rodent-control-issue--year-of-the-rat/

above:
Often out of sight, even a small population can cause substantial structural damage to poultry farms. It's estimated that more than 20% of all poultry farm fires are caused in part by rodents chewing through live electrical wires.

Rodents and the Damage They Cause on Poultry Farms

Adverse effects on feed conversion rates

Rodents pose many threats to poultry farms. They consume and contaminate large amounts of food sources, especially stored food and feed for chickens. An adult rat can eat and contaminate more than 100 kilograms annually of stored grains and feed. At first glance, those amounts might seem small, but over time, even a small rodent population of 200 rats will likely eat and contaminate 20 tons of feed annually. At an approximate price of $150 per metric ton, that's $3,000. With feed accounting for 60% to 70% of farm operating costs, the loss of 20 tons of feed per year can dramatically effect feed conversion rates.

Transmission of infectious diseases

Feed contamination leads to rodents posing a major risk to food safety and food hygiene. Rodents are known to carry 45 diseases and 200 human pathogens often transmitted to the flock and even to humans and non-targets such as birds and pets. They transmit disease-causing organisms via their droppings, feet, fur, urine, saliva, and blood. Through infected poultry manure, rodents can contaminate the food and water designated for healthy flocks several hundred feet away, or introduce a disease to nearby uninfected houses increasing the transmission of infectious diseases and creating a biosecurity threat. In particular, the largest rodent-related disease threat to poultry animal health, food safety and overall farm biosecurity is Salmonellosis, an infection caused by *Salmonella* bacteria.

Structural damage and destructive fires

Property damage is another costly problem instigated by rodents. Rodents chew through walls for better access to food and breakdown insulation and building materials and take it back to their burrows. This affects the structural integrity of walls, floors and ceilings while increasing energy inefficiencies that lead to higher energy costs to keep poultry houses at the ideal temperature for optimal growth and productivity. In addition, rodents create more entry points for birds and other wildlife seeking food and shelter.

The most significant damage to a poultry facility and infrastructure starts with rodents gnawing on electrical cords and cables. Often, this leads to equipment malfunctions, network shutdowns and even power outages. In some cases, this culminates with a life-threatening fire that risks the safety of people and livestock throughout the farm. Rodents have demonstrated time and again that given enough time, they are a destructive force to be reckoned with and should not be ignored or taken lightly.

Rodent Behaviours and Physical Characteristics

Rats generally live outdoors or within poultry house walls and roof cavities and invade the internals of poultry houses looking for food and water sources. Mice generally live within the poultry environment protected from the extreme heat in summer and the bitter cold of winter. Regardless of the type of facility, poultry farms can support large rodent populations attracting each of the three commensal rodent species which have distinct physical features and habits:

- *Rattus rattus* – Ship rat, black rat, roof rat, fruit rat
- *Rattus norvegicus* – Norway rat, brown rat, wharf rat, sewer rat
- *Mus musculus* – House mouse

The most effective control measures can only be adequately planned once the rodent(s) population has been correctly identified. The table below provides physical and behavioural information about the three species of rodents that most commonly infest and cause damage to poultry facilities.

above:
If rodents are seen during the day, the colony may be so large that older rodents have to forage in daylight or the colony is well established without any threat in day light.

	 *Rattus rattus*	 *Rattus norvegicus*	 *Mus musculus*
Common names	Ship rat, black rat, roof rat, fruit rat	Norway rat, brown rat, wharf rat, sewer rat	House mouse
Adult weight	200 – 350 grams	300 – 450 grams	15 – 25 grams
Length (head + body)	150 – 220 mm	200 – 250 mm	60 – 90 mm
Length (tail)	180 – 250 mm, longer than head and body	150 – 200 mm, shorter than head and body	80 – 100 mm, usually longer than head and body
Fur and colour	Smoother and softer than *Rattus norvegicus*; variable in colour ranging from a rare black colour to grey/grey brown above with a white or pale grey underneath	Rough and shaggy; grey to brown with grey or off white underneath	Variable in colour ranging from yellowish brown to grey above, with a white, grey or pale yellow underneath
Ears and hearing	Thin, translucent, large and hairless; excellent sense of hearing	Thick, opaque, short with fine hairs; excellent sense of hearing	Large with some hairs; excellent sense of hearing
Eyes and sight	Large and prominent; poor sight, colour blind	Small; poor sight, colour blind	Small; poor sight, colour blind
Snout, smell and taste	Pointed; excellent sense of smell and taste	Blunt; excellent sense of smell and taste	Pointed; excellent sense of smell and taste
Droppings	Scattered; spindle or banana-shaped, about 12 mm long 	In groups, but sometimes scattered; ellipsoidal capsule shaped, about 20 mm long 	Scattered; rod shaped, 3-6 mm long 
Habits and habitat	Nests mainly in walls, roof voids, vines and trees; however, can develop extensive burrows; active, agile climber; rarely found in sewers; rather more erratic and unpredictable in habit than *Rattus norvegicus*	Does burrow; lives outdoors, indoors and in sewers; nests in burrows; can climb, though not agile; very good swimmer; conservative, somewhat predictable in habit; will avoid unfamiliar objects, e.g. bait trays, placed on runs, for some days; need to gnaw to keep their constantly growing incisor teeth worn down; creatures of habit; will leave regular runs to and from feeding areas	Sometimes burrows; lives indoors and outdoors but is almost unknown in sewers; nest generally within stored materials but may burrow; climbs; erratic in habit; inquisitive toward new objects
Feeding habits	Omnivorous, mainly fruits, nuts, grains and vegetables; consumes 25 – 30 grams per day, drinks water or eats food with high water content; range 30 metres when looking for food	Omnivorous, more likely to eat meat than *Rattus rattus*; consumes up to 30 grams per day, drinks water or eats food with high water content; will hoard food for future consumption; most likely to eat at night; range 50 metres when looking for food	Nibbles; prefers cereals; consumes 3 grams per day; unlike rats, can survive with very little water and often obtains sufficient water in food without the need to drink; range 1.5 – 5 metres when looking for food
Lifespan	9 – 18 months	9 – 18 months	9 – 18 months
Sexual maturity	2 – 3 months	2 – 3 months	1 month
Litter size	5 – 10	7 – 12 (up to 18)	4 – 6 (up to 12)
Reproduction rate	5 – 6 litters per year	About 6 litters per year	About 11 litters per year

Selontra® Soft Bait Rodenticide - An Innovative Solution

Selontra® Soft Bait is an innovative solution that offers several unique advantages for poultry producers. It is attractive and highly palatable to rats and mice, which increases its effectiveness in locations where other appealing food sources are readily available. In trials, Selontra was 13.2 times more palatable than maize silage; 4.3 times more palatable than animal feed and more palatable than other leading rodenticides. Population control (of localised rodent populations) can be achieved in as little as seven days, which is up to three times faster than anticoagulant rodenticides.

The active ingredient in Selontra is cholecalciferol which is lethal to rodents in high concentrations. Due to its unique mode of action, the development of resistance to cholecalciferol in rodents is considered highly unlikely; no cases of cholecalciferol resistance have been reported globally. Selontra is a soft block formulation using patent-pending technology, which delivers the unique advantages of cholecalciferol in a highly palatable bait matrix that rodents will readily consume. This novel formulation remains stable and effective in dry environments and across both hot and cold temperature extremes.

Selontra causes rodents to lose their appetite and stop feeding faster than most competitive products. This allows for just enough bait for a lethal dose to be consumed making Selontra up to 33% more efficient than many anticoagulant rodenticides. Subsequently, less-dominant rodents are able to feed sooner, with population control being achieved after as little as two bait applications. Conventional anticoagulant baits may require up to six bait applications to deliver similar results. Selontra significantly saves time and labour while reducing the damage caused by rodents.

Due to the unique mode of action, Selontra does not bioaccumulate or persist in the environment. Selontra also contains safeguards to help prevent accidental human consumption: a warning dye and the bittering agent Bitrex®, which is used in a concentration that is undetectable to rodents but acts as a human taste deterrent. These factors ensure producers can feel confident that they are achieving the best level of control.

Studies on birds (quail and mallard) have shown that compared to rats and mice, they are approximately 50-times less sensitive to cholecalciferol. Secondary poisoning studies on 0.075% / 0.08% cholecalciferol baits have shown no signs of toxicosis in the cats, dogs or birds tested.[1]

[1] Eason, C.T. et al. (1996), Proc. 17. Vertebrate Pest Conf. 54-58.
Marshall, E.F. (1984), Proc. 11. Vertebrate Pest Conf. 95-98.
Erickson, W. and Urban, D. (2004).
Potential Risks of Nine Rodenticides to Birds and Non Target Mammals: A Comparative Approach.
United States Environmental Protection Agency, Washington, D.C.

above:
Place in lockable bait stations throughout the infested area. For best results, use stations with bait-securing rods.

Selontra® by the numbers	
3X *Faster*	**Controls rodents during downtime** Controls localised infestations in as little as 7 days — up to three times faster than most anticoagulant baits.
30% *Less*	**Uses less bait than most rodenticides** With stop-feed technology, Selontra® prevents rodents from over-consuming bait.
4x *Appealing*	**More palatable** Selontra is 13.2 times more palatable than maize silage; 4.3 times more palatable than piglet feed, one of the most palatable feeds.
-18°c to 77°c	**More durable in extreme temperatures** In heat stability tests, Selontra did not melt, seep, or spoil, unlike many other rodenticides. Selontra is still effective once thawed from -18 degrees Celsius.
0 *Resistance*	**No known rodent resistance** The development of resistance considered highly unlikely.
3 *Areas to Use*	**Flexible label** Suitable for use within and around poultry houses, off building and along facility fence lines and within free range facilities.

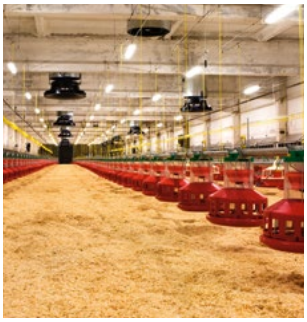
Steps for Complete Rodent Control

Sustainable rodent control requires that a full Integrated Pest Management (IPM) strategy be developed and implemented around the site. This includes maintaining proper site hygiene, implementing harbourage reduction measures, installing rodent-proofing measures and preventing access to alternative food and water. BASF recommends implementing the following steps to ensure effective, long-term rodent management. Together, they provide a complete rodent control solution.

above:
Eliminating overgrown vegetation and controlling clutter are essential steps in reducing rodent harbourage sites.

1. Inspect

- It is important to conduct a thorough inspection of the site. During inspection, find out which rodent species are present, where they are located and how they enter key structures. Consider which site conditions and activities may be conducive to the rodent infestation, and identify areas where rodent-proofing and harbourage reduction may be required. Look for evidence of infestation, such as holes, droppings, footprints, and signs of damage or feeding.
- Sketch plans of the site marking rodent signs and the proposed placement of potential bait points. Note the degree of public access of non-targets to the site. Identify all entry and exit points and document them on your site plan.
- The presence of children and non-target animals, such as pets, livestock and wildlife will influence your choice of baiting control strategies. Keeping non-targets safe should be a top priority.



above:
Downtime is the best time to control rodent infestations. Unfortunately, most anticoagulant baits can take far more time, up to 28 days, to gain control. Selontra® rodent bait controls populations as fast as seven days fitting downtime schedules.

2. Select

There are multiple measures that need to be put in place to control rodent populations, including chemical treatments. Before selecting a baiting program, consider the the following measures to help further control the rodent population.

- **Site hygiene** measures must focus on ensuring the site is as clean as possible at all times. In particular, stock feed areas should be cleaned regularly, with spillage removed daily. Any areas within the site where feed spillage or stock waste accumulates should be regularly cleaned, and all refuse bins should be adequately sealed and covered. Access to alternative food and water should be prevented.

- **Harbourage reduction** measures should focus on areas within buildings and away from buildings where rodents take cover or travel through the site. This may include stockpiles, machinery, unused or cluttered storage areas and overgrown vegetation. Rubbish within or near site buildings should be reduced or eliminated where possible. Stockpiles of materials such as soil, rock or organic waste should be removed quickly from the site, as these areas provide attractive harbourage and nesting sites for rodents. Particular focus should be placed on reducing overgrown vegetation (grasses and weeds). Grasses and weeds provide cover for rodents and a high-nutrient food resource, both of which are essential for breeding and reproduction. Therefore, control of vegetation up to at least 1 metre away from buildings is recommended. The use of a residual herbicide, such as Arsenal® Super, can assist with these types of harbourage reduction measures.

- **Rodent-proofing** is an integral component of any Integrated Pest Management (IPM) strategy. Rodents can gain access to structures by gnawing through timber, mild steel or plastics. As a general rule, rats can gain access through a hole the size of an adult human thumb, while mice can gain access through a hole the size of an adult human little finger. Holes may be rodent-proofed using steel wool, sheet metal or wire mesh or cement. Pay particular attention to feeding troughs and feed silos.

3. Treat

Selontra® must be handled responsibly and in compliance with label instructions while taking humans, poultry flocks, non-target animals, and the environment into consideration. The information below provides the recommended application techniques for Selontra. Please refer to the approved product label for specific use information.

- To reduce the risk of primary poisoning, Selontra must be placed in lockable tamper-resistant bait stations.
- The recommended placement of bait points is no greater than 9 metres apart for rats and no greater than 3 metres apart for mice, which are the same baiting guidelines for anticoagulant baits.
- Place bait points around and within structures with particular focus on areas where evidence of rat/mouse activity is seen. It is also recommended to place a baiting point on each side of every doorway where rodents are likely to enter.

* Selontra® must only be used in lockable bait stations

above:
Lay baits systematically along runs between nests and feeding sites with the appropriate bait amounts and bait points according to label. Always protect non-targets using bait boxes, or covering bait so that it is only accessible to rodents.

above:
One key is to immediately provide a lethal dose to dominant rodents so the rest of the colony gains access to the bait more quickly.

Steps for Complete Rodent Control *(Cont.)*

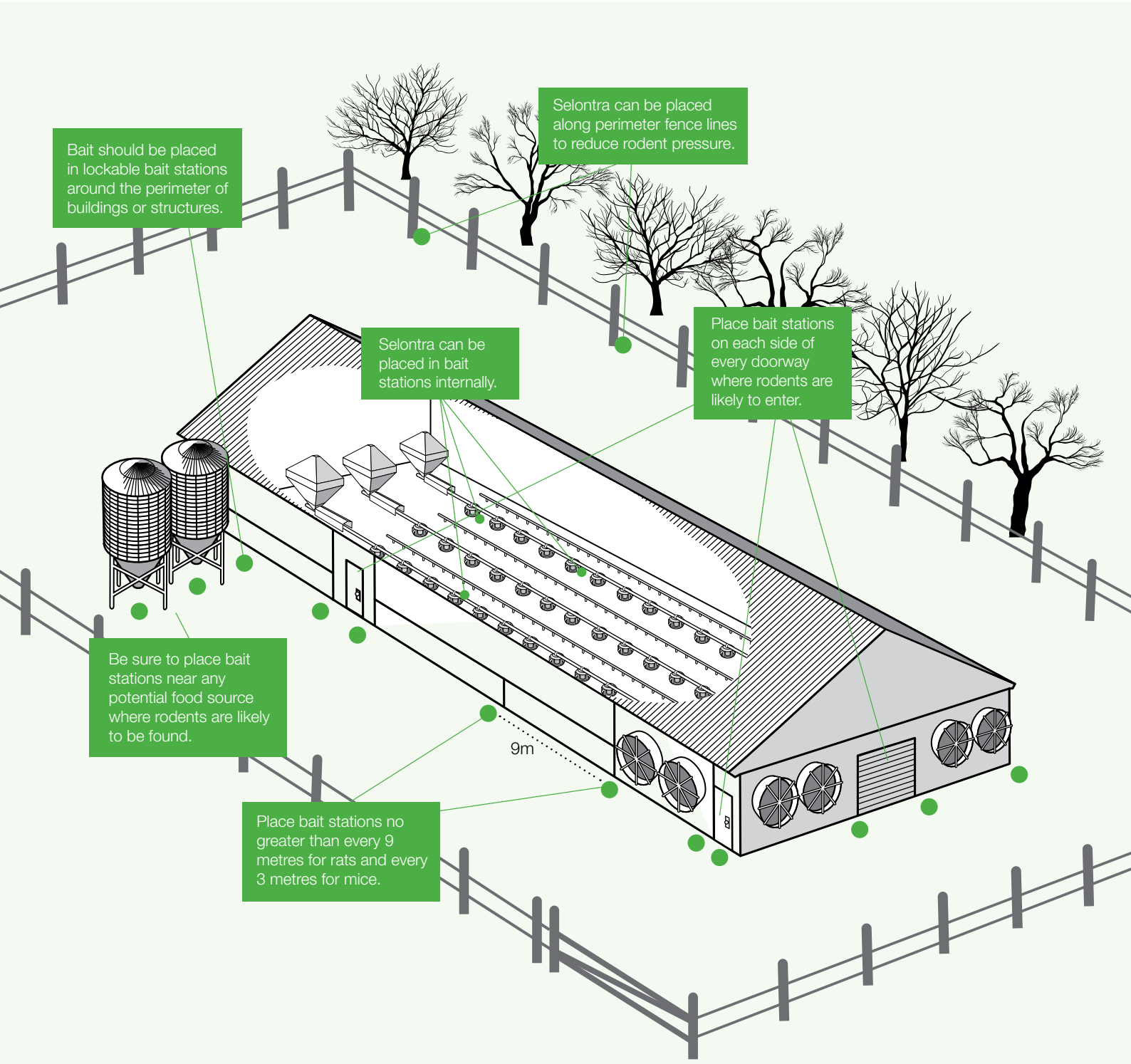
- If crop fields are adjacent or run parallel to your farms, you may need to place more stations around the buildings in those areas, especially during times of harvest. Bait points may also be placed along perimeter fence lines providing a first line of defense.
- The recommended number of Selontra bait blocks to be used per bait point is between 3-9 for rats and 1-2 for mice. For severe infestations, use the highest-recommended number of bait blocks with the highest density of bait placements.
- Selontra may be used to control localised rodent populations in as little as 7 days, provided that sufficient bait for the size of the infestation is placed on the first day of treatment. For large infestations, inspect all bait points 1-2 days after the first bait placement. **Important application note: Using nine bait blocks per station on days 1 and 2 is important to achieving control in as few as seven days. Under-baiting may lead to suboptimal results.**
- If bait is completely consumed at a bait point, double the dosage when re-applying bait. In such situations, using the highest label rate of 9 bait blocks per bait location for rats or 2 blocks per bait location for mice is recommended to ensure bait is maintained at that location.
- If no bait has been consumed at a bait point for an extended period of time, consider moving that bait point to another location. These strategies will ensure optimum control in the shortest time.
- Continue to inspect bait points regularly. Note that if an insufficient amount of bait is placed at any time of the treatment, suboptimal results may occur. Continue placing bait as needed.
- Collect and dispose of all dead rodents throughout the treatment. At the end of the treatment collect unconsumed bait and dispose of in accordance with state, territory and local guidelines, regulations, ordinances and laws.
- Long-term rodent management is achieved only with a continued, well-managed program. It is therefore imperative that a complete rodent control program with adequate site inspection, site hygiene, harbourage reduction, rodent-proofing and baiting measures is maintained all year-round.

4. Bait Rotation

Around the outside of poultry sheds Selontra® can be rotated with BASF's Storm® Soft Bait and Storm® Secure Wax Blocks. Storm Secure and Storm Soft Bait contain the active ingredient Flocoumafen, a highly potent second generation anticoagulant. Due to the potency of the active, only a limited amount of bait is required to gain control. Furthermore as these baits are easily secured in bait boxes, the risk of contamination around the site is minimised. For outside and around building applications only, the following rotation is recommended:

- Selontra during the spring and autumn seasons. Spring and autumn are often high pressure rodent periods due to the availability of seeding grass and the climatic conditions throughout Australia. During this high pressure period, baiting with Selontra is recommend.
- Storm Soft Bait during winter. During the winter season rodents tend to seek high calorie food sources. Storm Soft Bait is a unique formulation containing both high fat content and high protein content making it the perfect rotation partner for winter months.
- Storm Secure Wax Blocks during summer. Summer in Australia can be hot and humid, Storm Secure has been developed to be resistant to both heat and humidity and contains a unique fungicide to minimise mould growth. The high grain content formulation is also perfectly suited for summer months.
- Internally and away from buildings - Selontra is the only BASF product registered for off building use and recommended for internal use.

Effective Bait Placement

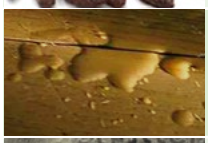
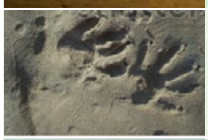
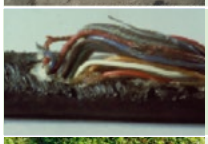
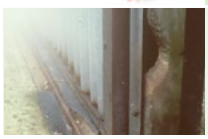


Identifying Rodent Activity

Surveying the farm and facilities

Conducting a thorough visual inspection of the facility is just as important as applying control measures. Prior to visiting the location, go to GoogleMaps.com and enter the physical address of the operation. View the facility from a bird-eye view to give you a good overview of property size, number of structures and potential areas where rodents may be active. Print out the image and take it with you to the site or take your digital tablet to assist you with surveying the property. Use this information as you develop a strategy to control and eventually eliminate rodents in your poultry environment so the business can be the most operationally fit: from biosecurity health to a healthy bottom-line.

As you conduct a thorough inspection of the site, look for rodent signs listed below, both indoors and outdoors.

Rodent Signs		Rodents are nocturnal and feed mainly at night so they are rarely seen. The following are signs that rodents are present.
	**Droppings**	Rat droppings range between 12mm to 20mm long. Mouse droppings range between 3mm to 6mm long.
	**Urine Stains and Odour**	Rats frequently urinate and leave body smears as they move around. The odour of even small populations of rodents is easily identified. Mice have a more concentrated urine-like odour which is different to rats.
	**Tracks**	Noticeable paths along exterior walls, in vegetation, or rodent footprints and tail marks in sand or dust indicate a problem. Rodent movement patterns can be detected by using tracking dust or light sand.
	**Gnawing damage**	The double gouge marks of rodent twin incisors are easily identified. The relative size of the teeth gouges can give a clue to the species.
	**Burrows**	Burrows are holes in the ground that lead to a rat's nest. The burrow entrance is typically up to 10 cm wide and is commonly found under buildings, patios, compost mounds, bolt holes, wood piles, low vegetation and accumulated heaps of rubbish.
	**Nests**	Mouse nests are usually found in houses or other such structures to protect them from the weather. Typical locations are loft spaces, garages and under floorboards. The nest will comprise of shredded materials found in and around the building, such as paper, plastic and cloth.
	**Food Debris**	Food debris, such as partially chewed food or empty nut shell cases can be indicators of rodent activity. Rats tend to eat all the food they find, but will still leave inedible food stuffs such as nut shells. Mice often leave half eaten food behind.
	**Sightings**	Rats are generally more nocturnal than mice and are not usually seen during daylight hours. Older, less dominant rats in large populations may look for food during the day as they cannot compete for the food at night. An observation of foraging rats during the day can be an indication that a large infestation may be present.
	**Sounds**	Rats and mice can be heard moving about during quiet periods at night. In some cases, even gnawing and scratching sounds can also be heard.

Ten Steps to Stewardship

The following steps are sound, quick-reference stewardship advice that is easy to remember and should be shared with all appropriate individuals involved in your pest control program.

1. Have a planned approach once the site has been properly assessed.
2. Document the quantity of bait used and where it is placed.
3. Use the appropriate number of baiting points.
4. Look for and dispose of rodent bodies.
5. Be extremely careful to prevent access to bait by non-target animals.
6. Always inspect and replace bait as the label directs.
7. Remove all remains of bait once treatment has been completed.
8. Ensure that if bait stations are used that they comply with local requirements.
9. Have emergency contact information readily accessible as found on the label in case non-target animals exhibits symptoms of poisoning.
10. Always comply with all state and federal statutory laws and regulations found on the label.

Safety and First Aid Measures

Please refer to the approved product label in your country for more specific safety, stewardship and first aid measures.

Safety Instructions

- Wash hands after use.

Storage

Store in closed original container in a cool, well-ventilated area. Do not store for prolonged periods in direct sunlight. Store in a locked room and away from children, animals, food and feedstuffs, seed and fertilisers.

Disposal

Dispose of old or unused bait safely as per label directions and in accordance with appropriate state, territory and local guidelines, regulations, and laws.

First Aid Measures

- If poisoning occurs, visit a doctor or hospital immediately for treatment advise.

Note to Physician

Cholecalciferol causes hypercalcaemia. Treat symptomatically. Treatment would include a low-calcium diet, high salt and fluid intake and avoidance of exposure to sunlight. Monitoring serum calcium levels may aid treatment. Cortisone has been used successfully in some cases.

Treatment for Pet or Non-Target Animal Poisoning

Call veterinarian immediately if a pet or other non-target animal consumes this product.

Note to Veterinarian

Calcium Mobilizer Cholecalciferol: If clinical signs develop, treatment consisting of saline diuresis combined with the use of furosemide, corticosteroids and phosphate binders is recommended. Calcitonin or pamidronate may be needed for animals that remain hypercalcaemic despite symptomatic treatments.

Poisoning Symptom Information/Injury Reporting

To obtain information on symptoms of poisoning or if you have concerns about using Selontra, please contact the appropriate emergency advice line below.

24-Hour Emergency Advice Telephone Number

Australia: 1800 803 440

We create chemistry

BASF Australia Limited
Level 12, 28 Freshwater Place,
Southbank, Victoria, 3006 Australia

crop-solutions.basf.com.au

ALWAYS READ AND FOLLOW LABEL DIRECTIONS.

210631 12.2021