

Rodent Central

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Rodents are an on-going pest problem for every poultry producer, every feed mill and hatchery manager in the business. You may not see them, you may not even see any evidence that they are around, but you can count on it. Don't be too discouraged, however. It is true that some types of rodents (rats) can actually be eliminated from a facility, and mouse infestations can be effectively suppressed. That said, it is also true that the need for effective rodent management is a constant. Neglect it and all your past efforts will count for nothing. Emphasize on one aspect of your rodent management program (mouse control, for example), and the rats may well sneak in the back door while you're not looking. Rely on the same old baiting routine without reassessing its effectiveness or scouting for signs of new rodent activity, and you may find hundreds of roof rats living in your attic. In short don't get lazy. One hundred percent control may not be possible, but you can sure keep rodent populations in check. Today, I'll review those practices that make up an effective rodent management program. The model I'll use is a breeder farm, but the principles apply to feed mills and hatcheries as well. Many of the things I'll cover are already in place, while others could use improvement.

Rodent Particulars: Let's begin by taking a look at our adversaries. In general, rodents are very acrobatic. They can climb most surfaces (I've watched many a mouse run up a wall), and can make vertical jumps that are amazing. Rats can leap straight up as much as 36 inches; mice as much as 12 inches. Rats and mice are shy, but inquisitive. Given enough time, they'll investigate every new object that shows up in their environment. These rodents are nocturnal and have poor eyesight, relying on hearing, touch and smell to navigate in their environment. Rats and mice have an amazing reproductive potential. Rats breed at 3 months of age, and produce 4 to 6 litters a year with up to 12 rats each. Mice breed at 6 to 10 weeks of age, and have 5 to 10 litters a year with up to 6 mice per litter. A quick bit of math makes it clear that just a few rats or mice can become many within a year or two.

The primary rodent pest in most situations is the common house mouse (*Mus musculus*), followed by the Norway rat (*Rattus norvegicus*), and the roof rat (*Rattus rattus*). House mice are small (only 6 to 8 inches, nose to tail tip), brown to gray in color and have prominent eyes and relatively large ears. Norway rats are the big ones, with adults ranging from 12 to 18 inches in length, nose to tail. They have fairly compact, heavy bodies, are gray to brown in color, and have relatively small eyes and ears. Their tails are generally no longer than half their body length. Norway rats are prodigious burrowers. Roof rats and mice are not. Roof rats are nearly as long as Norway rats at 14 to 16 inches nose to tail, but they are considerably more mouse-like in appearance. Their eyes and ears are relatively large, and their tail is as long as their entire body length. The roof rat has been a relatively rare rodent in poultry houses, but we have seen more problems with this rodent in recent years. The roof rat has no doubt been around in low numbers for some time, but infestations in eastern NC are on the upswing. I suspect this has happened in part because most of our attention has been focused on Norway rats.

Rodent Management Particulars: A complete rodent management program includes regular *monitoring*, specific *sanitation* practices, continuous *exclusion* efforts, and appropriate *control* for specific rodent problems.

Monitoring – Observation is your best tool in your battle against rodents. Monitoring for the most part is nothing more than doing just that, and should be done on a regular basis. Encourage growers and their workers to look for rodent activity anytime they are in the poultry house. Plan for more systematic scouting as well. Inspect 10 or more random locations throughout the house at least once a month. A good flashlight to light dark areas, and a simple schematic of the poultry house to mark locations where rodent activity is heaviest will be helpful.

What should you be looking for? Let's start inside the house. Look beneath slats for signs of Norway rat burrows or shallow mouse holes. Check egg belts and housings at the back of nest boxes for rodent droppings. Look along sills, curtain folds, and around fan housings for gnawing damage, dropping or tracks and tail marks in the dust. Check the corners in anterooms or egg handling and storage rooms for rodent droppings. Be on the lookout for bits of insulation on the floor, on or beneath the slats. Look overhead in open ceiling houses for dark smudges along exposed sill plates, which may indicate areas used as roof rat runways. Look up to the roof's gable for signs of insulation damage or live roof rats or mice hanging out on rafters and cross bracing. Examine the plastic sheeting of insulated overheads for holes, especially along water lines, eaves and in corners. Examine overhead spaces above the sheeting for evidence of roof rat or mouse activity such as burrows in loose insulation, droppings, conspicuous piles of insulation surrounded by bare areas, and live rodents. If houses are equipped with eave vents or plenums, take some time to examine these closely for live rodents, droppings or bits of insulation.

A walk around the outside of buildings may reveal other hot beds of rodent activity. Look for large burrows along building walls, feed bins or ditch banks within 50 feet of the poultry house. Note if there are well-used trails along walls or fencerows between buildings. Look for droppings, tracks or tail marks along such trails. Examine side curtains and cable housings for gnawing damage. Inspect evaporative coolers for droppings and gnaw damage to cooling pads. Even the location of rat-sized holes in cooling pads can provide a clue as to what type of rat has done the damage. Damage at the top of cool pads may indicate roof rats; damage at the bottom, Norway rats. Inspect the eaves closely for evidence that insulation is being pushed out of the overhead space of the building.

Nighttime visual estimates may prove useful where rodent activity is not apparent during the day, or when attempting to confirm particular areas of activity, entry points and rodent movement patterns. Such information is helpful when planning your control efforts.

Live trapping may be useful if mice are to be tested for *Salmonella* and other pathogens. Live, or lethal sampling with snap traps or glue boards, may be used to make quick population estimates of mice.

Lastly, here are a few words of advice about scouting for roof rats. These rodents are extremely shy. It is unlikely that you will see them out in the open during the day. Even at night, a slight movement will cause them to scurry out of sight. Their nesting preferences are for overhead areas and to a lesser extent wall voids. A great deal of patience and a little luck may be needed to get visual confirmation, but it is necessary for effective control. Because these rats seldom burrow and live in hard to access locations in the building, baiting and trap placements are often more difficult to achieve. Proper placement, however, is key to successful control.

Exclusion – Trying to keep rodents out of a poultry house sounds like a joke, I know. However, elimination of entry points is not the object. Exclusion efforts are simply intended to reasonably limit access and to direct invading rodents where you have better opportunities for control. To a lesser extent it can also be used to eliminate potential harborage that the building's exterior provides.

Start by walking the building perimeter to locate problem areas that can be effectively eliminated. Nail down metal siding where it has been pulled free. Be sure that all siding seams are flush. Mice and roof rats in particular may use the rough edge of an open seam to climb all the way to the eaves. Repair holes in damaged siding or foundation walls. Close gaps around pipes, conduits and feed lines where they go through the wall. Close gaps around fan housings as well. Cap bottom and top edges of vertical siding to close off corrugations where mice can enter. Keep all doors tight. Repair damaged housings around evaporative coolers. Use gravel to seal the lower edge of end doors once the flock cycle begins. Sometimes rodents can be excluded by simply opening an otherwise secluded space where they might have easy access to building interiors, or easily hide from view as they gnaw a hole into the side of the building. One such area might be behind the housings for curtain ends. Keep screening under eaves in good repair. Finally, keep a bare or mowed perimeter around the poultry houses. Clean ground discourages rodent traffic and makes it easier to spot burrowing or well-traveled runway.

Sanitation – Outside sanitation goes along with vegetation management around a building's perimeter. It doesn't do much good to keep the weeds down if lumber and old equipment are stacked near the poultry house, providing easy shelter for foraging rodents. Feed spills at outside bins are another strong lure for rodents. All such spills should be removed as quickly as possible. Be sure that all mortality is properly disposed of in a timely manner. Similarly, don't clutter up egg handling rooms. Boxes or flats stacked against the wall provide excellent hiding places. Avoid disposing of stale feed or eggs beneath the slats in the poultry house. Lax disposal of feed and egg wastes not only supply easy food for live-in rodents, they also contribute to fly breeding.

Control – The tools used to control house mice and rats are nearly identical. Some rodenticides are more effective for mice than rats and bait stations may vary in size, as will traps, depending on the rodent to be controlled. Otherwise, success is largely dependent on the method of their use for particular rodents.

The most effective active ingredients are generally single-dose rodenticides. These include: brodifacoum, difethialone, bromadiolone, cholecalciferol (considered a multiple

dose rodenticide by some), bromethalin, and zinc phosphide. Zinc phosphide is the only single dose active formulated both as bait and as a tracking powder. Useful multiple-dose rodenticides include diphacinone and chlorophacinone. Of these, the acute single dose rodenticides (bromethalin and zinc phosphide) are best suited for the rapid reduction of severe infestations, or where control efforts are time limited as when houses are baited heavily between flocks. Brodifacoum, bromadiolone, difethialone and cholecalciferol are most useful as maintenance options, providing effective control of rodents that eat it over a course of one or two feedings. The multiple dose rodenticides diphacinone and chlorophacinone are most useful as rotational products or because they are also formulated as concentrates or liquids that are well suited to special situations.

Baits (pellets or blocks) in bait stations placed along inside and outside walls of the poultry house are designed to intercept rodents where they enter the building or move inside the house. On the production floor, homemade bait stations with long drop tubes can be mounted along walls beneath slats. With the drop tubes protruding above the slats it provides a way to lift stations as needed to keep them on top of the manure. This approach provides an easy way to keep fresh bait available beneath the slats at all times. Pitch packs of bait may also be placed on the dry manure at the front of the slatted area beneath the nest boxes. These kinds of placements spaced at a minimum of 40 feet apart will provide plenty of opportunity for rats and mice to find baits. A shorter spacing may be needed if severe mouse infestations are the main problem. Don't forget to place stations in egg handling areas and coolers.

Block baits provide extra flexibility for placements overhead. They can be nailed to rafters, joists and sills where roof rats and mice move from nests in wall voids and attic spaces to forage for food and water on the production floor. They are also easily wired in place along water lines or conduits that rodents also use to move from place to place. Attach block baits as close as possible to obvious rodent entry points from attic or wall voids. Such entry points may be large openings, but are generally little more than small holes in plastic or insulation board. Many will be located in corners, along waterlines and conduits, at pulley attachments for cabling, near fan housings and evaporative coolers or along building eaves.

Roof rats present special challenges to achieve good control. Baiting on the production floor is often ineffective. Placements near obvious entry points from wall and enclosed overheads or along runways are useful, but frequently miss a substantial portion of the roof rat population. This is particularly true for roof rat colonies that have overrun attic spaces. Bait placements and/or the use of watering stations in attic spaces are often most effective. Often, several strategically spaced bait and watering areas are all that are needed to control roof rats because they readily forage over much larger areas than mice or Norway rats. Obviously, success requires that each area must be easily accessible so that rodenticide-laced water and pellets or blocks can be replenished as needed until the infestation is eliminated.

Norway rats are more easily controlled because of their burrowing behavior. Often these rodents live in burrows outside the building, venturing into the poultry house at night for food and water. Well-placed bait stations on the poultry house's perimeter and interior

will intercept many, but not all. Bait outside burrows to insure your Norway rat control program is complete. One or two consecutive days of baiting each active burrow with a single dose rodenticide is often sufficient eliminate the problem. Fill in baited burrows with soil after 3 or 4 days and check to see if any are reopened the following morning. If so, and if the bait continues to be taken, continue baiting for several more days. Where Norway's burrow inside beneath the slats control is less certain, but bait placements as described earlier will provide ample foraging opportunities for these indoor rats. Eventually your efforts will be rewarded.

RODENTICIDES FOR USE BY LIVESTOCK AND POULTRY PRODUCERS

SINGLE DOSE PRODUCTS

TRADE NAME

ACTIVE INGREDIENT

TYPE OF BAIT

Havoc Ropax Talon D-Con Mouse Prufe II Klerat Enforcer Ratak Plus Attack	Brodifacoum	Single Dose Anticoagulant. Causes death by internal bleeding in 2 to 3 days after a single feeding. Generally formulated as a pelleted bait for mice and rats or as weather resistant wax blocks.
Boot Hill Just One Bite Maki SuperCaid Bromone Hawk Ratimus Rat Arrest	Bromadiolone	Single Dose Anticoagulant. Causes death by internal bleeding in 2 to 3 days after a single feeding. Generally formulated as a pelleted bait for mice and rats or as weather resistant wax blocks.
Assault Vengeance Trounce Gladiator Gunslinger New Rampage	Bromethalin	Single Dose CNS Poison. Causes death by paralysis of central nervous system within 24 hours after one feeding. Generally formulated as a pelleted bait.

RODENTICIDES FOR USE BY LIVESTOCK AND POULTRY PRODUCERS

SINGLE DOSE PRODUCTS

TRADE NAME

ACTIVE INGREDIENT

TYPE OF BAIT

Assault
Vengeance
Trounce
Clout
Gladiator
Gunslinger
New Rampage

Bromethalin

Single Dose CNS Poison. Causes death by paralysis of central nervous system within 24 hours after one feeding. Generally formulated as a pelleted bait.

Quintox
Ortho Mouse-B-Gon

Cholecalciferol

Single Dose Metabolic Poison. Causes death by affecting calcium metabolism within 2 to 3 days after a single feeding if dose is large. Two or three feedings may be needed. Most often formulated as pelleted baits for mice and rats.

Hombre
D•Cease
Generation

Difethialone

Single Dose Anticoagulant. Causes death by internal bleeding within about 7 days after a single feeding. Formulated as a pelleted bait, and as a meal bait for mice and rats. Baits contain half the active ingredient of similar rodenticides.

RODENTICIDES FOR USE BY LIVESTOCK AND POULTRY PRODUCERS

SINGLE DOSE PRODUCTS

TRADE NAME

ACTIVE INGREDIENT

TYPE OF BAIT

Durvet Rodent Bait
ZP Tracking Powder
Zinc-Tox
Eraze
Ratol
Ridall-Zinc Rodent Pellets
Rodenticide AG

Zinc Phosphide

Acute Single Dose Poison. Causes death by heart paralysis and damage to liver and gut within minutes to a few hours after a single feeding or exposure. Usually formulated as a pelleted bait, a concentrate to be mixed with feed, or as a tracking powder.

Ramucide
Rozol
Drat
Ratomet
Mouse Out
Caid
Topitox
Raviac

Chlorophacinone

Multiple Dose Anticoagulant. Causes death by internal bleeding in 10 to 14 days of continuous feeding. Generally formulated as a pelleted bait for mice and rats, as a weather resistant wax block, or tracking powder.

Ramik Green
Durvet Rat & Mouse Bait
Tomcat
RoKill
Liqua Tox II

Diphacinone

Multiple Dose Anticoagulant. Causes death by internal bleeding in 10 to 14 days of continuous feeding. Generally formulated as a pelleted bait for mice and rats or weather resistant wax blocks. Also available as a liquid concentrate.