Vermin Control in Your Poultry House

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Definition

Wild animals that are believed to be harmful to crops, farm animals, or game, or which carry disease, e.g. beetles.
So the definition is not specified to certain species but the circumstances make an animal being categorised as vermin.
In poultry production rats, mice and beetles are generally classified as vermin. We will focus on mice/rats and beetles in this article.

The damage done by vermin

We can split this into 2 major groups:

- Damage to the environment, feed, food, equipment, insulation etc.
- Disease carriers and disease multipliers.
    - Vermin can transport diseases like salmonella, enterococci, campylobacter, marek, adenovirus etc from bird to bird, from house to house and from cycle to cycle
    - Vermin also can be a multiplier of diseases and be an active shedder. This is known mainly for bacterial diseases like salmonella. Cycle after cycle will be infected due to this vermin disease reservoir.

Mice/rats

Looking at the biology of vermin, we come to amazing numbers:

Mice:

- Mus musculus is the mouse, most common in the EMEA, the America's and Oceania.
- Length head and body 10cm, weight 15-30 grams, color brown grey.
- Tail shorter than body+head
- Excellent hearing, smell and taste. Color blind with bad sight.
- Omnivore with droppings 3-8 mm long and 1-3 mm wide, urine with a strong smell. Can survive without a water source
- Territorial range < 50mtr
- Mainly active during the dark part of the day.
- Lifespan 9-12 months, sexually mature in 6 weeks
- 3-6 nestlings per cycle. Maximum 10 cycles per year
- Mainly causing environmental damage

Rats:

- Norway rat and roof rat , rattus domesticus and rattus rattus.
- Roof rat has a tail longer that body+head, the Norway rat has a tail shorter than body+head.
- Roof rats do not dig tunnels as Norway rats do.
- Climbers with excellent memory, very suspicious, excellent hearing, color blind.
- Territorial range <100 mtr
- Mainly active during the dark part of the day.
    - Roof rat
        - Lifespan 9-12 month, sexual mature 2-3 months
        - 3-10 nestlings per cycle, maximum 10 cycles year
        - Excellent climber
    - Norway rat
        - Lifespan 9-18 months, sexual mature 3 months
        - 6-12 nestlings per cycle, maximum 7 cycles per year
        - A digger

While mice are very curious, rats are very suspicious. This is something we have to keep in mind in our control strategy. Both rats as mice are mainly active during the dark hours. If you see them on daytime, there is a big population present.

Rodent control is part of your biosecurity system most of the time executed and controlled by the QA team. It is not just the poultry farms but also feed plants, hatcheries, storage facilities, processing plants etc who all should have a rodent control program in place.

A control program has 3 pillars:

Mechanical, biological and chemical control.

Mechanical control:
This should start with the design and construction of the farm.

- A perimeter fence with a metal sheet on the bottom, 40 cm vertical and 20 cm horizontal.
- Foundation of the building should be 50 cm in the ground and 1 unit with the floor
- A concrete apron outside the house of 20 cm is recommended
- No vegetation around buildings for 3 mtr and no vegetation around the perimeter for 3 mtr.
- A 3 mtr gravel area around the poultry houses is recommended. Broken roof tiles are often used since they are sharp and rodents do not like to walk on them.
- Feed in bags; store on pellets
- Feed in silo’s; no spillage under the silo’s.
- Avoid open water sources.
- Remove dead birds immediately, store in rodent proof containers and incinerate daily if possible.
- Repairs, filling wholes etc best can be done during the house clean out.

Biological control:

- Traps and glue traps can be used and must be checked daily
- Traps must be placed against walls and in dark area’s

Chemical control:

- Most products work on an anticoagulation principle, feeding the poison inside a bait. Big advantage is that it takes some time before the poison becomes active. The rodent does not die where the poison is. This is an important factor in rat control.

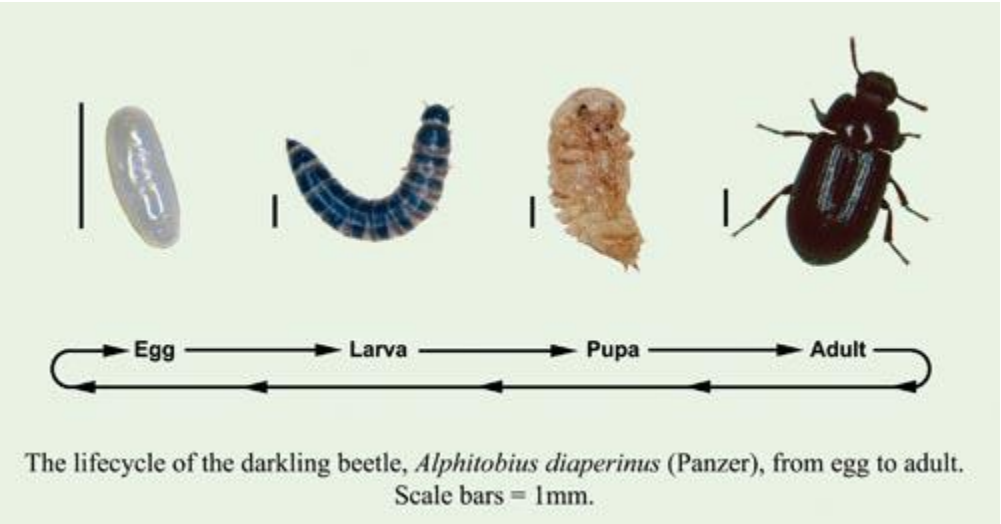
- Make a baiting plan. It should show the location of all boxes and traps and the number so that you can do a proper evaluation of bait consumption or catches in your logbook.
- Under normal conditions bait stations are placed every 25 mtr around a building and should be checked 4 weekly, In case of an infestation this goes up to every 5 mtr and a more intensive check.
- Inside bait stations depend a bit on the construction but surely must be present at the attic and in the feed room
- In stations with bait consumption the remains of the bait should be fully replaced with fresh new bait. Rats are clever and suspicious.
- A half year rotation program based both on taste as product should be in place
- Anticonception products are quite new in this market but can work very well. First you have to determine where there is bait consumption and then replace those stations with the liquid anticonception product. Females become sterile.
- During clean out period maintain the chemical pest control.

Beetles

The main beetle in the poultry houses is the lesser mealworm also named litter beetle.
The official name is Alphitobius Diaperinus.

Understanding our beetle:

An adult beetle is about 6mm long, brownish black, oval with six legs and nail-hammered chitine skin. It prefers warm humid environments. It undergoes a complete metamorphosis egg-larva-pupa-imago.
An adult imago can produce up to 2000 eggs in its life which is about 1 year.
Eggs turn into larvae within 4-11 days under optimal conditions (humidity-temperature). Larvae have 8-11 instars before turning into a pupa.
What we see in our houses are the larvae and the adult imago.
The total cycle length is depending on the ambient temperature; 90 days at 22 Celsius and 26 days at 31 Celsius.



The lifecycle of the darkling beetle, *Alphitobius diaperinus* (Panzer), from egg to adult.
Scale bars = 1mm.

In the chicken house, you will find the larvae under the pan feeders, drinking lines and the outer wall. The outer row feeders are especially popular.
You will find the adult imago's all over the house, but those in the litter have a weak moment when the house is emptied. They then escape either to the roof or in the soil. This is a moment where you can combat them effectively.

We can split the damage done by these beetles into 2 major groups:

- Damage to feed, food, insulation etc.
    - Consumption and destruction
    - We have to mention here that A. Diaperinus produces benzoquinones for self protection, but these quinones are toxic for humans
- Disease carriers
    - Beetles can carry viruses, fungi, bacteria and parasites from bird to bird and from cycle to cycle. Think here about salmonella, kinky back, Pasteurella, pathogenic E Coli strains and even avian leucosis virus. Gumboro disease is well known to be transferred by beetles from cycle to cycle. Beetles can infect surfaces but also can be consumed by birds and as such pass infections.

How can we limit the damage they cause?

Mechanical

- Litter removal
- Proper house drainage, water control.
- House repair in the house clean out period.

Biological

- Boric acid, damaging the skin of the larvae
- Pelleted straw: damaging the skin of the larvae once the pellet disintegrates
- Fungal infestation of larvae and imago's
- Good litter management

Chemical

- Carbaryl based products, blocker of the nerve system by inhibiting the enzyme acetylcholine-esterase
- Pyrethroid based products; nerves cannot repolarize.
- Insect growth regulators which prevent formation of chitine; the larvae cannot turn into an imago.

All over the world, professional pest control companies are active. Do not hesitate to contact them.

Please note that the described control methods are not permitted in some countries.