The Dangers of Darkling Beetles

Economic Impact

Research shows darkling beetles cause millions of dollars in damage annually to the poultry industry.[2] A 25% loss of insulation and 60% increase in energy cost are estimations of beetles' potential damage in poultry production facilities in one year.[2] Insulation damage also generates costly building repairs.[5]

Lack of a proper beetle control program can lead to a major infestation and result in structural damage to the poultry house, disease transmission, and productivity losses.[6] A good beetle control program can save a poultry producer between two and four thousand dollars per 100,000 birds.[7]

Structural Damage

A / Darkling beetles cause damage to different parts of a poultry housing facility, including wood structures and the spaces between concrete and floorings. Beetle larvae move into walls, tunneling through insulation to hide and pupate, which can make temperature management more challenging and can increase condensation problems.[5]

B / An infestation can also affect the land and buildings around the poultry house and can migrate to neighbouring buildings.

Health Risks & Disease

Darkling beetles provide an alternate food source to chickens, one that is not nutrient balanced. As a result, their normal feed consumption will become compromised and their growth rates will diminish.[1]

Each darkling beetle has the potential to spread the following diseases to your flock:[1,3,6,8]

- **Salmonella**
- ***Escherichia coli***
- **Marek's Disease**
- **Coccidiosis**
- **Round Worm**
- **Avian Influenza**
- **Fowl Pox**
- **Botulism**
- **Avian Reovirus** (ARV)
- **Avian Leukosis Virus**
- **Infectious Bursal Disease Virus** (IBDV)
- **Poultry Tape Worms**

Where Darkling Beetles Live

Darkling beetles hide during the day and come out to feed at night. If you happen to see one during the day, they are most likely scurrying from one hiding spot to another in places like support beams or underneath waterlines and feeders. Other places you may find darkling beetles are:

- **Debris**
- **Dirt**
- **Cracks & Crevices**
- **In Litter**

When birds are not present, adult beetles will hide to later re-emerge with the next flock.[4] Beetle populations usually peak when the flock is 3 weeks old.

About the Darkling Beetle

Otherwise known as the lesser mealworm ***(Alphitobius diaperinus)***, the darkling beetle is one of the most common pests found in poultry barns and can have a significant impact on your operation. Poultry barns are the ideal environment to foster their development by providing ample food, warmth, humid temperatures and shelter year-round.

In optimal conditions (30°– 90° relative humidity) a darkling beetle egg can develop into an adult in as little as 29 days.[4]

An adult beetle can reproduce almost immediately after emerging from the pupa. With a single female beetle laying more than 2,000 eggs over its lifetime, darkling beetles can quickly overpopulate a facility, with populations reaching tens of millions at a time. Populations also increase during the warmer months.

During cold weather, darkling beetles can undergo "supercooling," when their body fluids resist freezing temperatures to allow for survival in spite of the cold.[4,8]

Darkling Beetle Control

Darkling beetle control can be frustrating, as once established the beetles can never be fully eliminated.[4] Regular litter removal, good sanitation, and water management practices are important mechanical control measures. Use of insecticides with good residual activity, combined with rotation of different chemical classes to avoid the development of resistance is integral to managing this pest. Tempo® 20 WP Insecticide, Credo® SC Insecticide and NEW Annihilator POLYZONE® Insecticide provide effective control of the lesser mealworm larvae and adults in poultry facilities.

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DARKLING BEETLE

Alphitobius diaperinus

A / EGGS

Hatch in 4-7 days

Eggs are laid in clusters in manure or litter.[1] They are small (approx. 1.5 mm long), creamy white ovals that typically hatch in a week at temperatures from 15° to 38°C.[2]

Females can lay an average of five eggs per day in their reproductive prime.

B / LARVA (Mealworm)

40-70 days

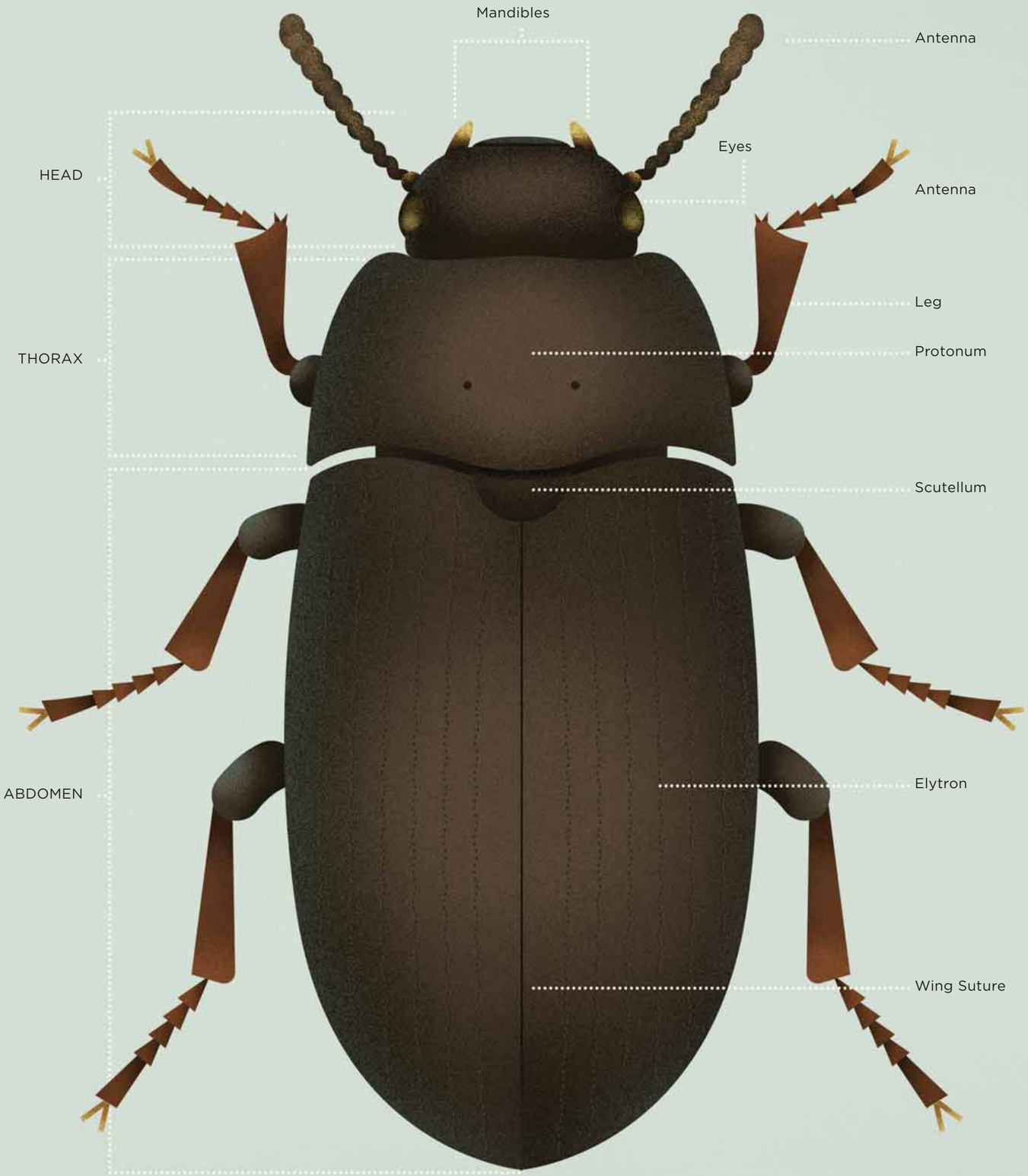
Larvae are yellowish, can reach up to 10 mm in length and may gather near water or feed. They have a head and 12 body segments and are similar to the caterpillar phase of butterflies. They have 6 legs in the front part of their body and all they do is eat and grow. This is the phase that is responsible for damage to poultry facilities.

Larvae migrate and burrow into insulation to pupate.[3] It is critical to reduce larvae levels as much as possible in each flock to control darkling beetle populations.

C / PUPA

5-10 days

Pupae are approximately 6 mm in length and tan coloured.[4] Pupated larvae in insulation is one of the main causes of structural damage to poultry houses.



D / ADULT BEETLE

LIFE SPAN

60 - 400 days (3-12+ months)

PROFILE

Covered with a smooth black, armour-like protective shell, darkling beetles have a pair of segmented antennas, notched eyes and three pair of legs.

HABITAT

Warm, dark, moist areas.

DIET

Decaying plant and animal matter, live plants, buds, fruit, fungi and grains.

SIZE

Approximately 6 mm long.

PREDATORS

Lizards, Rodents, Spiders, Birds and large Beetles.

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Consumption of adult beetles by birds can result in disease transmission and poor nutrition.[3]