

# Biology and life cycle of poultry red mite



**INNOVATION**





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Poultry red mites are external parasites that infest laying hens, breeders and pullets. High infestation of red mites has negative impacts on animal health, welfare and consequently egg production<sup>1-2</sup>. Impacts of red mite infestations include:

- Stress and irritation
- Increased feed and water intake
- Injurious pecking and feather loss
- Lower shell quality, blood spots on eggs and reduced egg production
- Increased risk of disease transmission such as Salmonella infections
- Anemia and in severe cases increased mortality

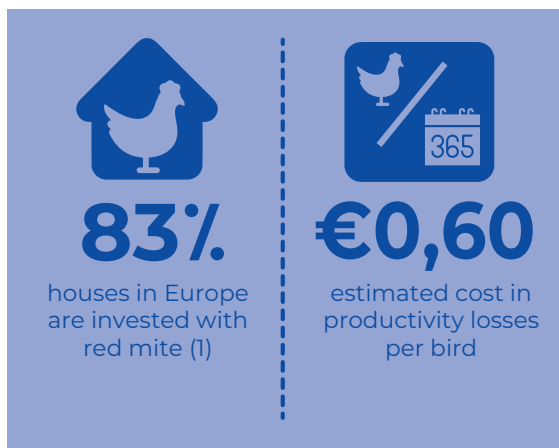
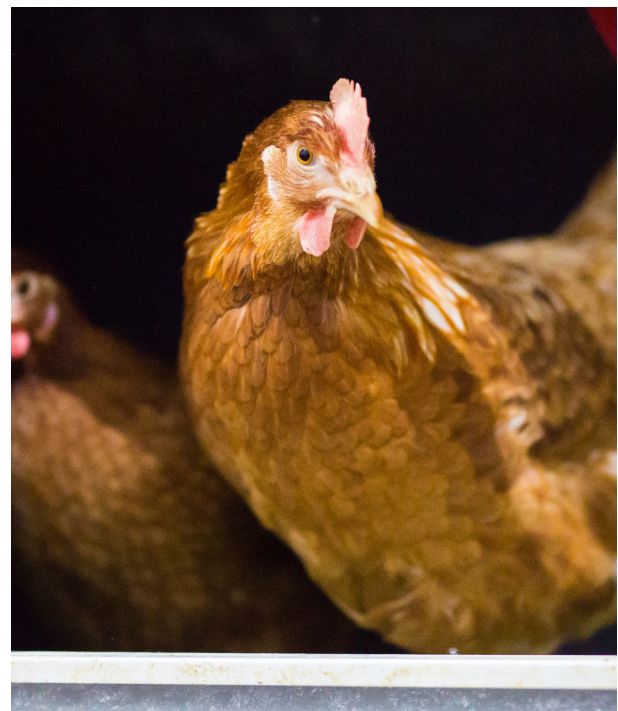


Figure 1: Route red mites take from the aggregate over structures of the housing system and perches and via the leg onto the hen to feed. After the blood meal mites follow the same route back to the aggregate'

## How do red mites feed?

Red mites are blood sucking parasites. They do not live on their poultry host but instead live within the housing environment, in the vicinity of the hens' nightly resting place and come out to feed during the night (Figure 1).

They do not stay on the hen for more than 30 – 60 minutes to feed. Mites locate their host by using different factors including temperature, CO<sub>2</sub> and specific pheromones emitted by the hens<sup>3</sup>.





## Spotting red mites

Mites are typically found in the cracks and crevices in poultry houses, in places inaccessible to the hens and close to where the birds rest. Hot spots of mites are specific to the system and environment and can even be different between successive flocks in the same house<sup>4</sup>. It is important to remember that you are unlikely to spot mites on hens during the day as they will be residing in clusters within the poultry house and equipment. **If clusters of mites are clearly visible in the system, then it is likely that the red mite infestation is already severe.** When the infestation level is high mites may also be seen on the hen.

**Tip!** Walk the poultry house two hours after darkness using a torch to look at the perches, supporting bars and the hens. As the mites will be more active, it will be easier to assess the red mite situation in the house.

## Common places to check for red mites

- At the end of the **perches** – pay attention to hollow ended perches
- Perches and perch supports – lift perch bars to check supporting structures
- **Nest** boxes – check nest box mats and lift nest box and egg belt lids to check underneath
- Along the **feed track** and under the feed track lip – check for the presence of mites by running a piece of paper along the feed track lip
- In **joins** between pieces of equipment such as joins between slats or where the slats rest on their support bars
- Under dried **manure** on perches, feed track, slats etc
- On poultry equipment which is **inaccessible** to the hens and in close proximity to where the birds rest at night – for example structural support bars

See also Figure 2 for example locations in layer houses where mites can be found.

Figure 2: Example locations to spot red mite – (a) perches and support bars, (b) red mites found in nest boxes and underneath nest mats, (c) feed track structures, (d) joins and support structures of the housing system, (e) under dried manure, slats or on the manure belt, (f) blood spot on eggs may be caused by eggs rolling over red mite clusters on the egg belt



Figure 3: Wooden equipment provides ideal hiding places for mites



Figure 4: Mites hiding under cable ties on perches

## Tips and tricks for reducing red mite hiding places

- If possible, avoid using wood in the house and for equipment as the cracks in wood provide ideal hiding places (Figure 3)
- Plastic plugs can be inserted at the end of the hollow ended perches
- Avoid using cable ties and other equipment which create small gaps as these provide great hiding places for the mites (Figure 4)
- When planning house design consider avoiding running manure and egg belts between houses as these provide ideal routes for the spread of mites between houses

## Ideal conditions

for red mite population growth



20-30°C



60-70%  
humidity

High temperatures (approx. 45°C)  
reduce lifespan of mites

Table 1: Results from an experiment demonstrating the potential red mite have for rapid population growth

Days after the start of the experiment	Mean number of red mites present
Day 0	200
Day 7	1173
Day 21	17851
Day 30	110218
Day 35	306333
Day 49**	444974

\*credit for the experiments and results: Lise Roy (UPVM3)

\*\*The trial in one out of 8 experimental units had a duration of 49 days, the other trials were terminated earlier

## Life cycle of the poultry red mite

The life cycle of red mite can be completed in as little as seven days under optimal conditions (see Figure 5): 25-30°C with 70% humidity. This means that large populations of red mite can quickly build up in the poultry houses. For example, from starting with just 200 fertilised adult females the number of mites can grow to around 450 000 in barely 8 weeks (Table 1). Below 5°C mites are inactive and cannot reproduce. Temperatures below -20°C and above 45°C are lethal to mites<sup>5</sup>.

Mites can survive up to 9 months without feeding<sup>5</sup>



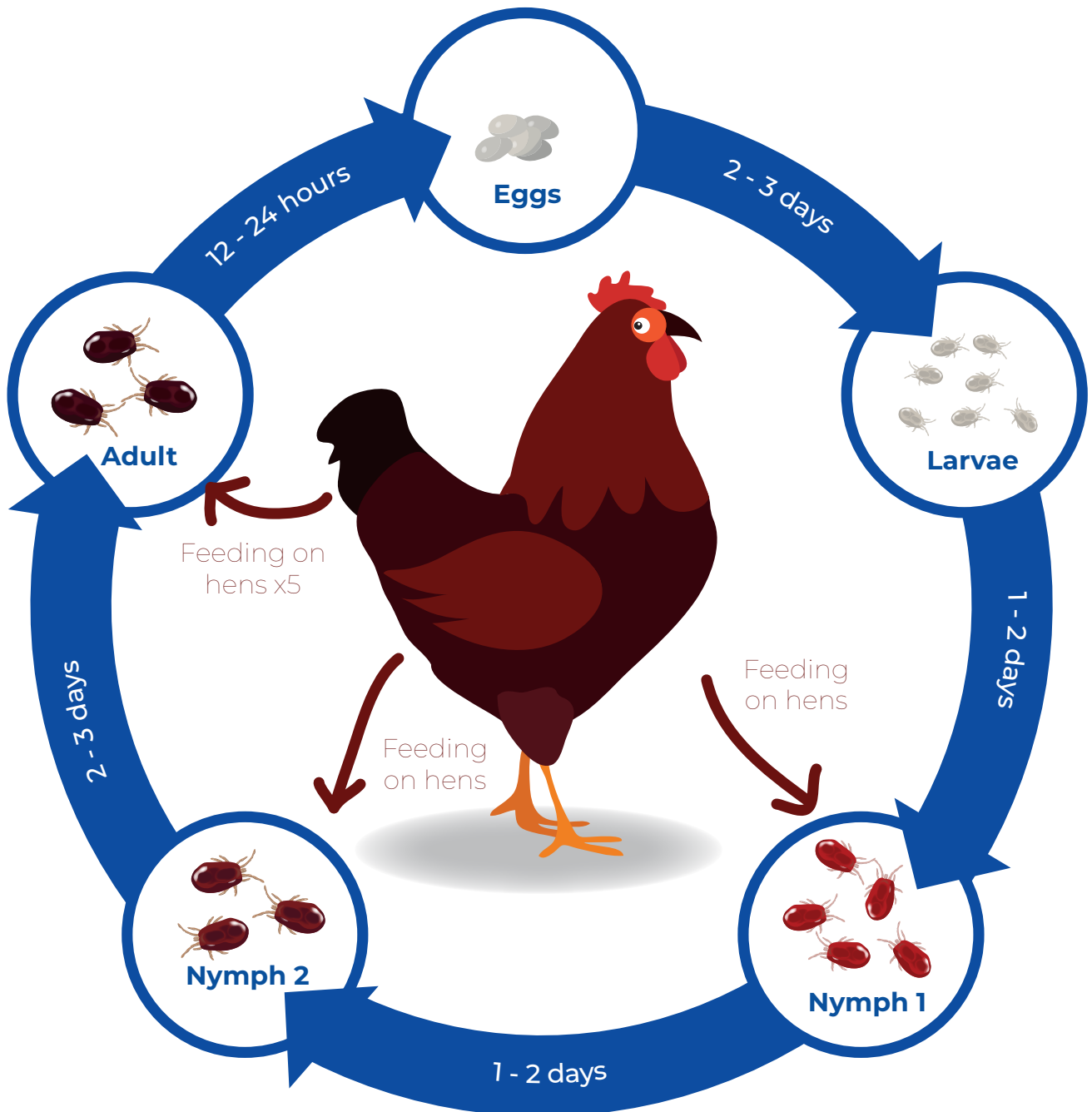


Figure 5: Life stages of the poultry red mite (based on Sparagano et al., 2014)

### Red mite life stages:

- Eggs: Small white eggs (each female mite lay a maximum of 30 eggs total in their lifetime)<sup>4</sup>
- Larvae: Six legs and do not feed – translucent in colour
- Nymph 1 (protonymphs): Eight legs and need to feed to molt to the next stage. Look bright red when they have just fed
- Nymph 2 (deutonymphs): Eight legs and need to feed to molt to next stage. Look slightly darker than protonymphs after feeding
- Adult: Eight legs, look red when fed and their color changes as they digest their blood meal: turn brown/black to grey once they have digested their meal. Females will feed before each lay (approx. 5)<sup>1-4</sup>
- See also Figure 5

## Acknowledgements

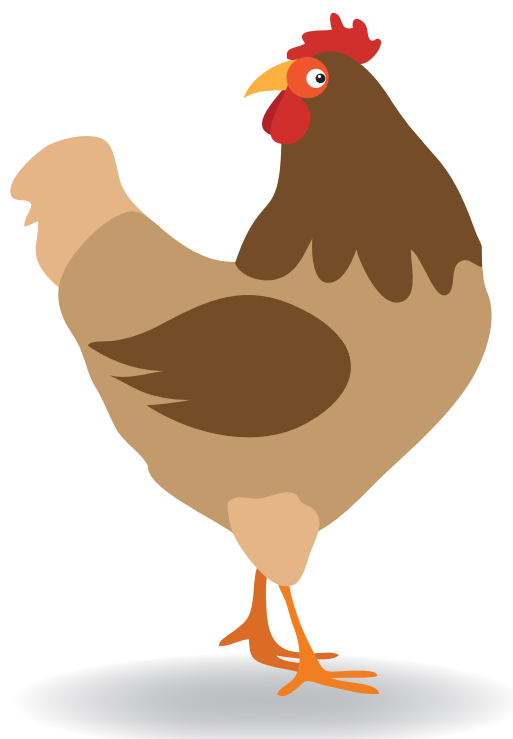
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## MiteControl project



Total budget received from Interreg North-West Europe (2014-2020): €2,05 million of ERDF

Total project budget: €3,4 million

