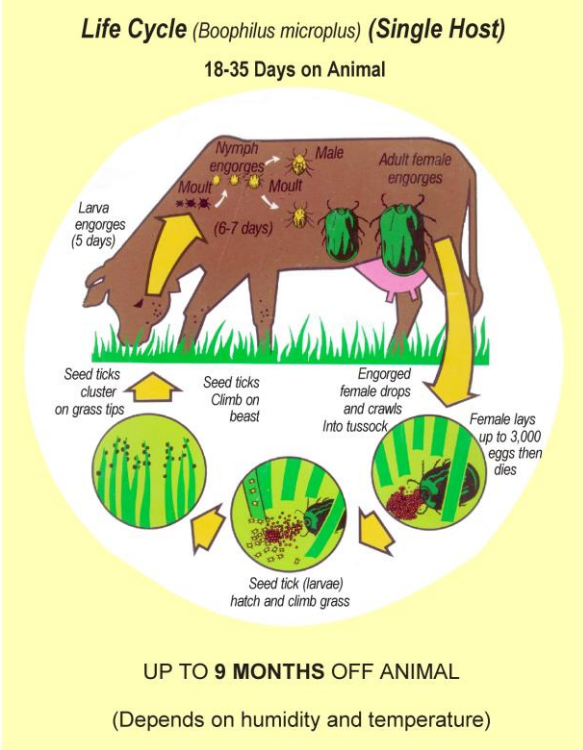
Guideline for identifying cattle tick and the life cycle stages.

This guideline will support the *'Procedure for Tick Free Manual Inspection of high-risk tick carriers'*, the *'Procedure for Visual Inspection of high-risk tick carriers',* the *'Procedure for manual Inspection of low-risk tick carriers',* and the *'Procedure for manual inspection – high-risk tick carriers free of adult tick'.*

Cattle tick life cycle

The cattle tick life cycle includes parasitic and non-parasitic stages as described below.

An understanding of these life cycle stages is important when conducting inspections of cattle tick carriers and in understanding the procedures required to eradicate cattle tick from infested land.



Parasitic stage

Cattle tick is a single-host species. The parasitic stage of the tick life cycle (the stage spent on an animal), is spent entirely on a single host.

The parasitic stage of the life cycle involves 3 stages; larvae, nymph and adult.

Cattle ticks undergo a moult on the host between the larval, nymph and adult phases. During the moult, the tick sheds the previous skin or shell, in order to emerge into the next life stage (i.e. larvae moult into nymphs, and nymphs moult into adults).

The parasitic stage begins when a larval tick climbs from the pasture onto an animal. The parasitic stage ends when a fully engorged female detaches from the animal and falls to the pasture.

Larvae

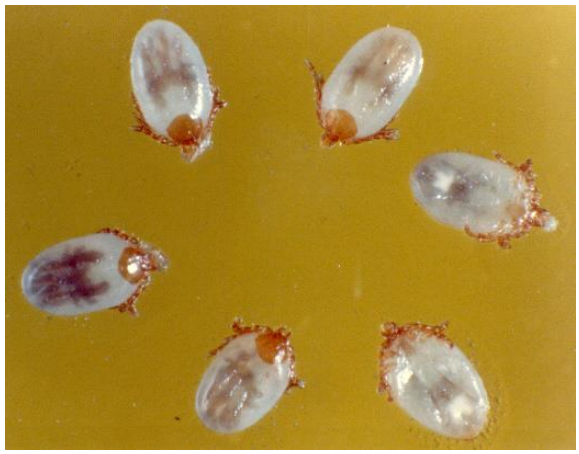
The larval stage is the first stage in the parasitic life cycle and is the first stage after the cattle tick climbs from the pasture onto the carrier. The larval tick does not immediately attach to the carrier and can wander over a suitable host for 24-48 hours before attaching.

Once attached to a suitable carrier the tick will remain attached to that animal until it has reached the adult stage and drops from the animal to complete the non-parasitic stages of the life cycle. Larval ticks do not ingest blood.

The larval stage can last for 5-6 days before moulting and entering the nymphal stage.

Size	Very small (i.e. pinhead size)
Colour	Brown to cream
Legs	6 legs (red)
Leg position	Well back from mouthparts
Mobility	Very active – mobility decreases as the tick engorges

Young larvae



Engorged larvae

Nymph

The nymphal stage is the second stage of the cattle tick life cycle. After moulting for the first time from the larval stage the tick emerges as a nymph. Nymphs spend 6-8 days feeding on the host before moulting into adults.

Size	Up to match head size when engorged (1-3mm)
Colour	Body ranges from brown to blue-grey; white at front and sides of body
Legs	8 legs (clear to pale cream)
Mobility	Limited movement
Other features	Body is pinched at rear

Young semi-engorged nymphs and engorged nymphs

Adult

The adult stage is the final parasitic stage of the cattle tick life cycle. After the second moult, the nymph emerges as an adult cattle tick. During this stage they feed constantly and in the last 24-48 hours of the adult stage they engorge, dramatically increasing their size to what is the most commonly known stage of the cattle tick. It is important to understand that this stage mainly occurs in the last 24-48 hours of its parasitic stages, immediately prior to detaching from the host.

Size	2mm newly emerged (moulted); 10-12mm fully engorged
Colour	Body – grey/brown to dark green/grey
Legs	8 legs (pale cream to amber); set well back from mouthparts
Mobility	Inactive (limited movement)
Other features	Small mouthparts

Newly moulted adult

Adult females at various stages of engorgement

Male cattle tick

Male ticks can live for up to 2 months. They are often found attached under nymphal or newly moulted adult female ticks during mating. Male ticks don't permanently attach to the host animal and only feed intermittently without engorging.

Male cattle ticks can migrate between host animals when carriers are in close proximity to each other.

Male ticks have been implicated in outbreaks of the tick fever disease *Anaplasma marginale*, which results from male ticks transmitting the disease from infected animals to susceptible animals.

Size	Up to match head size
Colour	Brownish
Legs	8 legs (pale cream to amber)
Mobility	Very active
Other features	Male ticks are similar to newly emerged (moulted) adult females but they have a spike on their rear end which is absent in the female

Male tick – dorsal view

Male tick – ventral view

Non-parasitic stage

The non-parasitic stages of the cattle tick life cycle are the stages where the tick is not on an animal (a carrier). These stages are spent in the pasture. After detaching from the host the female falls to the pasture and shelters from direct sunlight and begins the pre egg lay period. This is the time period where the blood meal is processed into eggs. This may take a few days to a month depending on temperature and humidity.

Egg laying takes 7-10 days in summer and up to several weeks during winter. Humidity has little or no effect on egg laying. A single female adult tick can lay up to 3000 eggs.

The eggs mature and hatch into larvae.

Environmental conditions affect the viability of the eggs and the time taken for the eggs to hatch.

During the summer, in warm and moist conditions, almost all eggs will hatch within 2-20 days. During colder winter months a very low percentage of eggs mature and hatch and if conditions are overly cold and dry, the eggs can become desiccated. In sub-optimal conditions, the gestation time can be prolonged until conditions improve.

Larval ticks can survive 4-6 months in ideal (warm and moist) conditions, but are also susceptible to desiccation during winter conditions.

After hatching, larval ticks are very active. They seek a new host by climbing to the top of grass and waiting for an animal to brush past the grass whereupon they climb on the animal.

The non-parasitic stage lasts an average of 2-6 months but can be up to 9 months. The main factor influencing survival and duration of the non-parasitic larval stage is environmental conditions.

The non-parasitic stage must be considered when designing control or eradication programs.

Low-risk tick environment

An environment that is managed as completely free of grass cover, such as a feedlot, cattle yards, or concrete surfaces does not support the survival of the cattle tick for several reasons:

- Engorged adult females exposed to direct sunlight desiccate and usually die before they can lay eggs
- Eggs laid in this environment will also desiccate and die before they can hatch
- Any larvae in this environment will rapidly desiccate and die. They are also impeded from climbing to the top of grass and attaching to other animals

Using knowledge of the timeframes of the life cycle stages and the impact of a tick free environment:

- will give a strong indication of the possible infestation levels of livestock and their ability to meet the inspection standards required in the risk minimisation requirements
- and play an important role in control and eradication programs

Images courtesy:

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Revision history

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1.0	June 2021	This document was originally a procedure under the Biosecurity Manual **eDoc No. 4714838** Changed to Guideline and added new information during major modifications to procedures/guidelines June 2021

eDOCS reference