Control of Bovine Tuberculosis (bTB) – Badger Ecology - Part 3

INTRODUCTION

Bovine Tuberculosis (bTB) can infect any mammal including humans, cats and dogs and has been isolated in a number of wild mammals including; badgers, deer, fox, mink, moles, rats and wild boar. All of the above species have the ability to become infected with bTB, however scientific research has shown that badgers are a significant reservoir of *Mycobacterium bovis* (*M. bovis*), posing a risk to cattle.

Fig 1: A badger ready to leave the safety of its sett.

The following bulletin describes badger behaviour and ecology and aims to provide practical examples of where bio-security best practice may help reduce the risk of cattle coming into contact with badgers and vice versa.

Any bio-security programme should form part of your herd health plan, be prepared in conjunction with a veterinary surgeon and reviewed regularly.

BADGERS – AN INTRODUCTION

Badgers (*Meles meles*) are members of the *Mustelidae* family. Other members of this group include the Weasel, Stoat, Polecat, Pine-marten and Otter.

Badgers are powerfully built and typically have small heads, short thick necks and strong limbs and claws making them expert and efficient diggers.
Importantly badgers are creatures of habit and live in social groups (i.e. extended families) of varying size, which occupy a territory.

Badgers are true omnivores and will eat all sorts of things including earthworms, insect larvae, slugs, small invertebrates, hedgehogs, rabbits, small mammals, carrion, bird eggs, berries, fruits, nuts, maize, oats, wheat and barley etc.

Badgers generally live 3 to 5 years (seldom more than 6) in the wild. Turnover rate in the population is high. The annual adult mortality rate is 30% for males and 24% for females. Badgers can mate at almost any time during the year; however births are synchronised to occur at the same time of year, with the majority taking place between mid January and early March.

The number of cubs born per litter can vary from one to five though the usual number is two to three. Cub mortality is high with 50-65% dying in their first year.

Interestingly badgers can and do swim, have been known to move stones weighing over 25kg, generally move at a slow walk but can run at speeds up to 30km/hr over short distances when alarmed, and are able to climb trees.

BADGERS – HABITAT / ENVIRONMENT

Badgers inhabit and breed in a complex burrow system known as a sett.

Sett's can vary greatly in size but a typical sett has anything between 3 – 10 holes / entrances (large sett's can have 50 entrances or more). Setts are generally formed by a system of interconnecting tunnels ending in sleeping / dunging / breeding chambers.

Fig 2: An entrance to a badger sett in a wooded copse.

A sett is easily distinguishable from a rabbit or fox hole, being much larger, not narrowing inside the entrance and with large spoil heaps and smooth polished sides around the entrance.

Control of Bovine Tuberculosis (bTB) – Badger Ecology - Part 3

No two setts are alike with habitat features such as terrain, climate, and soil types being the main determining factors. Badgers in the UK inhabit a wide range of habitats including, woods, copses, scrubland, hedgerows, quarries, open fields, moorland and hill sides etc.

Optimum habitat is a mixture of deciduous woodland and earthworm rich pasture with a mild wet climate. Setts in a dry, warm and safe environment, with some foliage cover, usually on a South West facing slope are the “norm”.

Fig 3: A smooth, well worn badger sett in sandy clay soil.

If badgers are found living in close proximity to farms and farm buildings it becomes extremely important that feed stores and cattle housing are secure to prevent access.
The badger population is estimated at over 325,000 in England however it is difficult to know the true population as no national badger survey has been undertaken in the last 15 years.

BADGER BEHAVIOUR

Badgers are creatures of habit and generally cautious / conservative when it comes to the location of setts. They will use the same setts for many years, with some large setts having been in existence for hundreds of years.

Badgers will only usually abandon their setts if factors such as human interference, loss of a food source or flooding etc make it impossible to live there anymore. If new setts are created they are often within existing territories and act as outliers or subsidiary setts of a main sett.

Cubbing setts used for the rearing of cubs are often in close proximity to main / large setts (i.e. within 300 - 500 yards).

Digging / excavations and bedding collection occur throughout the year however observations made suggest an increase in activity in the months of August – October as preparations for winter are made.

Fig 4: Example of a cleaned out sett.

Badgers have a sense of smell over 800 times more sensitive than our own and use this to follow well worn runs that emanate from a sett. They hear reasonably well but the nose is undoubtedly their primary sense organ.

Main badger runs are often very distinct and can be followed for hundreds of metres in some cases. Badger runs are also recognisable at field boundaries as they as they go under or through hedgerows, under fences or up and over stone walls.

Badgers usually defecate in small holes which they dig, called ‘latrines’. Latrines are concentrated in the vicinity of setts and at strategic places near territory boundaries and abundant food sources. Badgers may also scratch the bark off trees in and around setts and sett entrances and it is believed this is done to either clean feet/claws after foraging or stretching upon waking up.

Fig 5/6: Well worn badger runs in summer/winter.

Fig 7: Typical latrine in summer containing both old and new faeces and, Fig 8: Typical latrine area on a bank side.

Emergence from setts is usually around dusk and therefore times vary throughout the year. Emergence times also vary according to age, sex, season, environmental conditions and human disturbance. Emergence is usually before dark from May – August, and after dark the rest of the year. Activity levels are reduced in winter.

Social groups are generally stable in undisturbed populations. There is no evidence to suggest that sick, old or infirm badgers are ejected from the main sett or family group, Badgers will only usually abandon their setts if factors such as interference, loss of food or flooding make it impossible to live there anymore.

Note: It is not possible to tell if a badger is infected with bTB simply by looking at it.

BADGERS – HOW THE DISEASE IS SPREAD

There is a complex relationship between badgers, cattle and the *M. bovis* bacterium.

The relative importance of transmission routes of bTB between badgers and cattle is not yet identified though inhalation thought to be primary route (direct transmission). Consumption of contaminated material is also important (indirect transmission) e.g. faeces, saliva, discharges from open wounds and urine.

Direct contact at pasture is relatively infrequent but does occur. Cattle may investigate badgers in spring when recently turned out and have been known to investigate dead badgers - creating potential for disease transmission.

Cattle generally avoid badger faeces when grazing but may investigate latrine areas by sniffing. Some studies have shown that lower ranking cattle graze pasture contaminated with badger faeces and high stocking density may lead to this behaviour occurring in the more dominant animals. Urine is more difficult to detect and is not actively avoided. Access to field edges/linear features could be more risky with contamination from badger faeces and urine at badger latrines.

Contact with sputum although rare may be a problem at mineral licks or at supplementary feed.

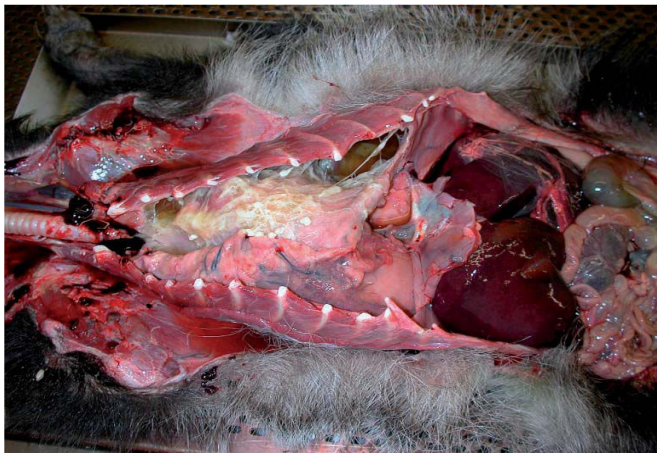

Fig 8: Badger in the later stages of TB infection.

Ultra violet light (sunlight) has been shown to inactivate the organism within minutes, although. *Bovis* may remain viable for several days on pasture depending on the time of year and weather conditions.

It is not known how long a sett or contaminated soil remains infectious, the most reliable evidence suggests that the organism may remain pathogenic in soil for up to 6 months if conditions are favourable.

Date: 30/11//2010