European Foul Brood (EFB)

This is a disease of unsealed (open) brood. EFB is a Notifiable Disease and if suspected **MUST** be reported to the Agriculture Department as soon as possible.

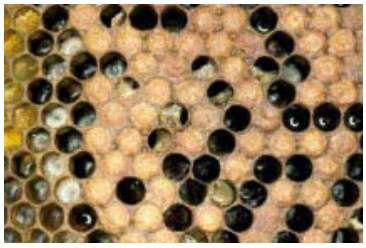
Cause
EFB is caused by the bacterium *Melisococcus pluton* .Unlike AFB this bacterium does not sporulate and is therefore much easier to disinfect.

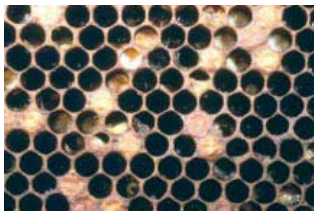
The Disease
The larvae are fed the bacteria with the brood food which multiplies in the ventriculus (stomach) using the larval food. The bacteria lodge between the peritrophic membrane and the food in the ventriculus.The bacteria act essentially as a parasite competing for food, and the larva dies of starvation about 3 or 4 days before the cell is due to be sealed. During this period the larva contorts itself into unusual positions in the cell and its colour changes from pearly white to cream and then to a yellowy green colour. Much of the early colour change is due to the bacterial mass in the larval stomach. The larva is twisted spirally or flattened out lengthways in the cell.

Signs in the Colony


Affected unsealed brood

It will not always be possible to see signs of EFB in the colony.
The appearance is of dead larvae in open cells, particularly if they are in an abnormal position. It has been suggested that they give the impression of stomach ache which is a good analogy.
The colour of the larvae changes. They assume a 'melted down' appearance but still have the larval shape.
Smell is variable and when present due to other contaminating bacteria
In light infections there may be no larvae to examine as the bees remove them whole once they are dead.
Infection can be confused with other diseases such as Sacbrood and Neglected drone brood and may need laboratory confirmation.
Larvae which die can decompose quickly and if left in the cells form a dry brown scale. This also is easily removed by the bees. This leads to a 'pepperpot' appearance of the brood frame.
If they survive the larval stage they can produce either normal or undersized adults and leave infective organisms in the voided faecal matter in the cell.


Twisted, discoloured larvae


Dead brood with scales

The best time to look for EFB is when the brood outnumbers the adults such as in spring (Mid April to early May).
Because the bees clean up the dead larvae it can be a difficult disease to spot but should be considered if the colony is failing to build up properly in the spring.

Diagnosis
This can only be done by examination of the larval stomach contents under a microscope.

Spread
Because the dead larvae are removed whole by the workers contamination of the hive is reduced. However if any of the larvae survive their faeces are a source and will be spread by the house bees. Spread of the disease between colonies is usually done by the beekeeper. Contaminated comb, honey and hive equipment can transfer the bacteria. This can also transfer the infection between sites.
As the colony becomes weakened robbing by neighbouring colonies will further spread the disease. Drifting can likewise spread the disease to other colonies
Swarms can carry the disease which starts again once they start to raise brood.

Control is by regular examination of the brood comb.
There is a treatment option for EFB if the infection is considered light and confined to a few colonies. This decision is made by the Bee Officer.
If treatment is considered Oxytetracycline hydrochloride is administered in a sugar syrup under the supervision of the Bee Officer. It is **illegal** to treat bees without authorisation.
If treatment is not considered appropriate then destruction by fire of any infected colony is carried out. The bees, frames and combs are burnt in a deep pit. Hive bodies and appliances can be sterilised by scorching them with a blowlamp but if there is any doubt about the quality of the sterilisation it may be better to burn the lot. Hive tools and smokers can be washed in hot water containing washing soda and bleaching powder. Personal clothing should be washed in hot soapy water.
Don't forget that once EFB has been present in a colony a reservoir of bacteria will remain on the comb with the potential for later re-infection.

Rules for Foul Brood Control

1. Know the signs and causes of the disease
2. Inspect carefully in Spring and Autumn
3. Never transfer combs between colonies before checking for disease
4. Never bring colonies or combs into the apiary unless from a known clean source
5. Never buy old combs and scorch second hand hives before use.
6. Control robbing and never feed honey from another source.
7. If a colony dies seal the hive and test for disease.
8. If a colony is not thriving examine for disease.
9. Never trust swarms. Hive them on foundation and check for disease.
10. Regularly replace old brood comb with foundation.

Finally - learn to recognise healthy brood and disease brood will be much more obvious.