



Squirrelpox Virus: Advice Note for Vets

Squirrelpox Virus (SQPV) poses a major threat to red squirrel populations. Grey squirrels are not affected by the disease, but it is lethal to red squirrels within 15 days from onset. The disease is highly infectious, and can be transmitted by both red and grey squirrels. Although a lot remains unknown about SQPV, there is strong circumstantial evidence that grey squirrels act as a vector for transmission. Research is currently being conducted to help identify how squirrels become infected, and the method by which the virus is transmitted between squirrels.

SQPV is a key cause of red squirrel decline and can devastate local red squirrel populations where it becomes prevalent. Please report any suspected cases to the Red Squirrels Northern England Project (RSNE), see www.rsne.org.uk.

Identifying SQPV

Red squirrels in the initial stages of onset appear lethargic and doxy with poor coordination. They may start to show signs of lesions and ulceration to exposed skin. If the squirrel is caught at this stage, it may be possible to treat it. **However, it should be noted that the survival and recovery rate of treated red squirrels remains extremely low to date.**

Veterinarians should make an informed decision whether to treat an infected squirrel, and should contact RSNE if necessary for further discussion. Euthanasia may be the most appropriate course of action once the disease has been diagnosed.

By the second week of onset, the squirrel develops swelling, ulceration and lesions on all areas of exposed skin; around its mouth, eyes, nose, paws and genitals. SQPV symptoms appear very similar to those of myxomatosis in rabbits. At this stage of onset the squirrel is likely to be highly infectious, and practicable efforts should be made to remove the animal from the wild to avoid transmission to other squirrels.

Lesions and ulceration around the eyes, ears, nose and mouth of a dead red squirrel, typical of SQPV disease.



(Photo by Mark Wilkinson)

When a squirrel is alive and is exhibiting lesions typical of SQPV, try to take a sample of the lesion/scab. This can be sent away for testing to identify if live virus particles are present. Such a sample should be sent to Paul Duff at the Animal Health & Veterinary Laboratories Agency in Penrith (AHVLA; the address can be found later in this document). The AHVLA can provide rapid confirmation of virus presence.

Treating SQPV

A course of medication and care has been developed by veterinarians to treat red squirrels infected with SQPV. To date, however, treatment has had a very low success rate.

Always wear thick, heavy-duty work gloves, ideally leather, when handling sick or injured squirrels as they have very sharp teeth and claws.

Please advise the public that sick red squirrels found in the wild should be placed in a cardboard box (larger than shoebox size) with a secure lid and air holes and taken to the veterinary surgery for treatment.

If there is any time delay, they can provide the squirrel with a small dish of water or some segments of sliced apple. Keep the red squirrel in the box in a warm, quiet, dark area away from direct sources of heat until transportation can be arranged.

Suggested veterinary treatment:

- Broad spectrum antibiotics, e.g. Baytril
- Anti-inflammatories e.g. Metacam
- Rehydration – Sub-cutaneous Hartmann's (intra peritoneal can be very effective with comatose animals) Oral – Lectade, critical care formula
- Feeding – Syringe feed e.g. Farleys Oat and Apple or similar
- Eye drops - fucithalamic
- Interferon 0.1ml daily
- If the red squirrel dies the body can be sent for post mortem. The results of these studies are used in a range of red squirrel projects. For instructions see accompanying Information Sheet.

Use of Virbagen Omega for treatment of red squirrels with SQPV:

- The dose should be calculated on the basis of 1 mega unit (MU) per kilogram body weight given subcutaneously daily for three consecutive days. As with most things, the earlier treatment can be administered the better.
- Each vial contains 10 MU and should be reconstituted with the saline diluent supplied. However, as this volume may be quite fiddly for dose computation it is fine to use ordinary saline for injection to bulk up the volume to make computation more manageable.
- Once reconstituted, keep refrigerated and it will maintain potency for 21 days.
- The diluted product can also be broken down into smaller volumes or individual doses and be stored indefinitely in the freezer.

Suggested care of juvenile red squirrels

On receiving a juvenile red squirrel, first warm the animal and rehydrate it using saline solution. Once it is passing clear or slightly yellow urine then it is fine to be fed.

For very young squirrels the advice is not to feed until it is warmed – on a warming pad at 30-33°C for 45 minutes.

Then:

- De-flea the animal.
- Keep at 25°C if still blind. If the eyes are open the squirrel will be 21 days or older.
- Provide a nest of paper and tissues; no towels, wood shavings or sawdust.
- Provide a draft-proof box which is completely secure – squirrel kittens are highly active. Ensure there is a warm dark area within the box.
- Keep in a location that offers peace and quiet to reduce stress.

Feeding

- Don't feed in the location of the nest – use a separate box.
- Feed one or two 5ml syringes per time. Feed 5-6 times a day, between 5am and 11pm (they would not normally be active outside of these hours).
- If the kitten takes too much liquid there is a danger it may contract pneumonia; do not use a medicine dropper.
- Encourage the kitten to urinate and defecate at each feed until it is regularly able to do so on its own, otherwise there is a risk of constipation and urine retention. Stimulate the uro-genital area using warm wet cotton wool or cotton buds and gently rub.

There is a large body of opinion as to suitable foods for juvenile red squirrels. All milk formulae should be offered warm, ideally at body temperature. Squirrel milk is high in dry matter and high in fat and the following options have all been used:

- **Cimicat** every 2-3 hours. For older babies (150gms+) can use undiluted.
- **Lactol** diluted at 1 part to 3 parts water + one drop of ABIDEC in the first feed. In cases of constipation add a little brown sugar (SSPCA). This is also favoured by David Stapleford, a very experienced breeder.
- Goat's milk with an added calcium-phosphorous supplement.
- **Esbilac** or **Lamlac** (proprietary milk replacers)
- Puppy milk replacer is considered by some to be fine for a short while only.
- Cow's milk diluted with boiled water (50:50) with added glucose is considered by some to only be suitable if nothing else is available.

Once you have settled upon a choice then stay with it. Boost the squirrels gut flora by adding a probiotic to the milk.

Feeding methods

- **A few days old:** offer warm milk by dripping it onto their lips and wait for it to be swallowed.
- **1 Week to a few weeks old:** feed via a pipette then small syringe and direct the milk to the roof of the mouth to avoid choking. Gently massage the throat during feeding to encourage swallowing.
- **Young kittens** need to be fed every two hours, decreasing to every four hours at about 3-4 weeks of age (when eyes first open).
- **Older kittens** can be fed via a kitten milk bottle with a soft rubber teat, again direct milk to the roof of the mouth.

Weaning

When the squirrel kitten is around 5 weeks old, start feeding it a mixture of the milk and either bread or rusks. Then when the teeth are more developed, move it onto more natural foods including fruits (apples, cherries, grapes) and dry cereals (oats or wheat) and nuts (walnuts, hazelnuts and almonds); some advise against the feeding of peanuts or sunflower seeds to young squirrels.

Dead Red Squirrels

We advise that dead red squirrels are sent for post-mortem, in order to further our knowledge on the conservation and welfare of red squirrels. There are several places that dead red squirrels can be sent to depending on circumstances and location. Please select the most suitable recipient from below:

- **Dead red squirrels from Northumberland, Cumbria, North Yorkshire** should be sent to:

Paul Duff
Animal Health & Veterinary Laboratories Agency
Merrythought
Calthwaite, Penrith
Cumbria, CA11 9RR

- **Please note as of July 2013 the AHVLA cannot carry out post-mortems where cause of death is road traffic accident or predator kill. Please send any of these specimens to:**

Dr Tony Sainsbury
Institute of Zoology
Zoological Society of London
Regents Park
London
NW1 4RY

- **Dead red squirrels found in or near the Sefton Red Squirrel Refuge and other locations in North Merseyside** should be sent to:

Dr Julian Chantrey
Leahurst Veterinary Teaching Hospital
Liverpool University
Chester High Road
Neston, Wirral, CH64 7TE

- **Dead red squirrels found in Scotland** should be sent to:

Anna Meredith
Veterinary Pathology Unit
Royal (Dick) School of Vet Med.
Easter Bush Vet Centre
Easter Bush, Midlothian, EH25 9RG

*For packaging dead squirrels or sending any biological samples by post, please see the RSNE advice note : **Squirrelpox Virus***
