

## Prevention and Treatment of Fly Strike (myiasis) in Rabbits

Fly Strike is a common condition seen in domestic Rabbits, although it rarely happens in their wild relatives.

Green bottles (*Lucila sericata*) are the most common cause of fly strike in UK and northern European countries, mainly in sheep but also affecting other species as our domestic rabbit. Green Bottles are seasonal, emerging in April/May after winter and growing in number over the summer (Cruickshank and Wall, 2002). The incidence of fly strike has a direct correlation with the numbers of green bottles, which are strongly influenced by regional patterns of temperature and rainfall (Pitts and Wall, 2004). The last generation of adults will enter dormancy between September and October (Pitts and Wall, 2005).

The prevalence of Fly Strike in Southwest England and Wales has been estimated as high as 94% (Bisdorff and Wall, 2006) within the small animal and mixed practices. Therefore nearly every practice in UK is likely to see affected rabbits over the warmer summer months.

There are a number of conditions that will predispose our patients to suffer such an unpleasant condition. Flies are attracted to lay under wet conditions; the perineal area of the affected rabbits is usually targeted due to their moist conditions secondary to faecal or urinary contamination. Many authors consider this a secondary complication of a pre-existing condition (incontinence, inability to groom). Those could be classified in three big groups, leading to (Cousquer, 2006):

**Urine scalding** (*E cuniculi* - CNS lesions, kidney failure, vertebral damage, urolithiasis, cystitis, inactivity),

**Diarrhoea** (coccidian - predominantly young rabbits-, inappropriate diets - low fibre, high carbohydrates, iatrogenic dietary changes or dis-biosis post antibiotic therapy, other medications causing dis-biosis, bacterial enteritis) and

**Lack of caecotroph ingestion** (dental disease, arthritis, pain, obesity) (Cousquer, 2006).

Other pathologies that can create optimal conditions for fly ovoposition are ocular discharge, abscesses or skin folds (Vargas, 2013). In many cases there will be a combination of different factors that require to be addressed to prevent further episodes of myiasis. Overall, overweight rabbits are most commonly affected (Vargas, 2013).

Whilst all veterinary surgeons are familiar with this condition, one still encounters many rabbit owners whose opinion is that prevention is not necessary, as either the rabbit lives in doors, or that they are very fastidious about hygiene and would surely know and treat any issue quickly enough. Sadly, the reality is that even an animal as large as a sheep can succumb to myiasis within 24 hours of maggots being laid, so detecting and treating a rabbit subsequent to myiasis is as we all know, is at best painful, debilitating and expensive, but more commonly fatal by effect or client choice, in either situation the rabbit will inevitably suffer.

The Animal Welfare Act 2006, makes it quite clear that not only is every animal owner or keeper obliged to prevent unnecessary suffering or cruelty, but that are also **Section 9**, obliges the owner and / or keeper to provide 'good practice' in respect of husbandry. Whilst 'good practice for rabbit husbandry' is not defined in law, surely all colleagues would agree that 'fly strike prevention' would form an essential recommendation. Now that annual (rather than bi-annual) rabbit vaccines are a reality, some colleagues have raised concerns in respect

of not seeing and having opportunity to examine rabbits often enough, in respect of checking for dental pathology and ensuring general welfare needs are met. Whilst we routinely inform our clients about preventive medicine in dogs and cats, we should not fail to do the same for rabbits, as well as all other pets of any species.

Rabbit preventive medicine should start with adequate client education regarding diet, housing and hygiene, as well as basic physical examination of their pet. Daily routine inspections must be encouraged, rabbits have historically been predominantly chosen as a “children pet” and all too frequently neglected, thankfully now a days this is less often the case. As we have previously discussed, the underlying cause for “skin soiling” should be addressed to prevent re-occurrence, the author strongly recommends the use products that will either repel flies landing at all, or stop the eggs from hatching if egg laying has occurred, considering that one single episode of diarrhoea or unconsumed caecotroph could lead to this undesirable situation within hours.

There are different options licensed in the UK to prevent (some of which may also be adequate for therapy post myiasis) myiasis. Permethrin / Cypermethrin can be found in licensed products for rabbits (Xenex Ultra, F10 Germicidal Wound Spray with Insecticide) although these may need to be applied every 1-2 weeks. Ivermectin can also be found in a licensed form for Rabbits (Xeno 450), however this is not designed for prevention of fly strike. Another licensed product, Cyromazine (Rearguard) is the author’s choice due its longer period of action (10 weeks) with two applications (May and mid July) will cover the high risk period (May 1<sup>st</sup> – October 1<sup>st</sup>). In rabbits that require regular washes, (due to genital soiling), an alternative product is necessary, such that weekly applications (after washes) can be applied. In such cases we use F10 Germicidal Wound Spray with Insecticide. Fipronil is contraindicated in rabbits, as adverse reactions have been reported.

Presenting clinical signs of fly strike vary significantly, depending on the ‘life cycle stage’ at which the animal is presented. Prior to eggs hatching, the only signs relate to the primary condition which has resulted in soiling, at this stage the risk of myiasis can be easily missed. Once the larvae have commenced attacking the skin, in a relatively short period a large area of skin and deeper tissue may be affected. The infested rabbit will show lethargy and depression, dehydration, toxic shock, a characteristic putrid smell is generally evident as the patient enters the consulting room. Sometimes larvae are observed, although often undetected by the owners.

Myiasis treatment can be challenging. Often the clinician focus is removal of larvae and wound management; the only product licensed for myiasis treatment is F10 Germicidal Wound Spray with Insecticide, which may be applied directly to wounds. However effective fluid therapy at ‘shock levels’, effective analgesia and systemic antibiotics are all essential, practices providing such therapies demonstrated a better outcome (Bisdorff and Wall, 2006). Fluid therapy requirements will vary depending of the actual state of the patient. Initial bolus of fluid will consist of 10-15ml/kg of crystalloids (Hartmann’s) combined with 5ml/kg of hypertonic fluids given over 10 minutes. These boluses could be repeated until initial crisis is resolved, overall shock fluid requirement is 100ml/kg in the first hour. If placement of an iv catheter is unsuccessful, an intra-osseous catheter may be considered as an alternative. A relatively easy placement may be achieved in the proximal tibia. An assessment of the actual level of dehydration should be conducted and a fluid rate for the next 24 hrs including maintenance, dehydration and ongoing losses (relatively high due the possible extended skin lesions) calculated and administration planned.

Hypothermia may also be a consequence of toxic and circulatory shock and should be addressed. An incubator or a way of “active warming” is recommended, but temperature should be monitored as hyperthermia may readily occur in the summer months, as rabbits have minimal ability to achieve increased heat loss, hyperthermia rapidly results in distress, with potential fatal consequences.

Initial myiasis treatment typically consist of F10 Germicidal Wound Spray with Insecticide of all affected and surrounding areas, concurrent opioid analgesic (Buprenorphine, Morphine, Fentanyl) typically combined with sedatives (midazolam, medetomidine) (especially if to be hospitalised in proximity to cats or dogs). Sedation may also minimise stress associated with i/v catheter placement, removal of all larvae and eggs, together with appropriate wound management. Rabbit friendly broad spectrum antibiotics may be provided pending culture and sensitivity results. The possibility of Clostridia spp. infections has been stipulated as a possible cause of sudden death after surgery (Hess 2004), and therefore the use of Penicillin G may be considered. Other options include Enrofloxacin (licensed for oral or sc administration) or Co-trimoxazole.

The pain, toxaemia and stress associated with myiasis, is likely to lead to secondary stasis, so appropriate medication should be provided to manage this risk. Syringe feeding with a herbivore critical care diet (e.g. Oxbow Critical care Herbivore) is essential. In cases were rabbits are too poorly or stressed to accept syringe feeding, then nasogastric tube placement and feeding with Lafeber Emeraid Herbivore Critical care diet is recommended (this will easily pass down a 5Fr tube and contains 325 fibre – all be it soluble fibre). Prokinetics will be provided (Ranitidine, metoclopramide). NSAID’s should also be commenced as soon as the hydration status is assured.

Above all, with appropriate advice from our profession, this horrible condition should be a disease of the past. It is our belief that ‘**Prevention** (May 1<sup>st</sup> – October 1<sup>st</sup>)’ is an essential and legal requirement for all pet rabbits, it will only be achieved by firm, timely, recommendations from our profession.



Maggots



F10 Spray with insecticidal can be applied at the wounds of any affected animal

### **References:**

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Daniel Calvo Carrasco, LV MRCVS ECZM(avian) Resident

Graduated from Barcelona Vet School, spend a year training in Great Western Exotics and different referrals and Zoo across Europe and USA. He spent two years working in first opinion and emergency service before returning to Great Western Exotics as a Resident in Avian Medicine and Surgery. He is currently working in his CertAVP in Zoological Medicine. Dan works as a exotic and wildlife clinician.

