

Dropped hock syndrome (aka Sciatic Palsy) in NZ dairy cows – an update

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Summary: Since 2012, the Ministry for Primary Industries (MPI) and Massey University have been investigating the syndrome formerly known as "Sciatic Palsy". We now think this uncommon, idiopathic syndrome includes a range of presentations, including mild to severe dropping of the hocks and/or flying scapulas. The condition was initially thought to be the result of a neurological deficit (hence the name "Sciatic Palsy") however multiple post-mortem and histological examinations of cows over the past three years suggests that a musculoskeletal cause might be more likely. Therefore, the name "Dropped Hock Syndrome" is felt to be more appropriate. For previous updates on this syndrome see December '12 and March '13 updates in DCV Newsletter. A recent DCV Newsletter featured a case of "Flying Scapulas" which we believe might represent a variant of Dropped Hock Syndrome. This article gives an overview of what we currently know about the causes and treatment of this mysterious condition, as well as reference photos and videos, and information on how to report suspect cases.

The disease: In the early stages, cows can appear stiff with shifting lameness. More severe/chronic cases progress to stretching and/or bilateral rupture of the proximal gastrocnemius muscle, often at its site of attachment to the femur. In cases of "flying scapula", breakdown of the subscapularis muscle/scapula attachment occurs bilaterally. Muscle enzymes in severely-affected cows are high, probably due to repeated tearing and trauma, but CKs of less-affected cows are unremarkable (this might indicate that muscle is not the primary tissue affected, alternately it could mean that early peaks in CK have been missed). Figure 1 shows a moderately-affected cow, and Figure 2 shows a cow with more severe disease including both bilaterally-dropped hocks and flying scapulas.

A video of severely-affected cows with dropped hocks can be found at:

<https://www.youtube.com/watch?v=Hy54ayN49BE>

Differential diagnoses: Although the disease is fairly distinctive, other differential diagnoses such as metabolic causes of down cows, trauma (such as from damage to the pelvis during mating behaviour) and post-calving neuropathy should be ruled out using history and physical exam.

Affected demographic: Most cases occur in rising 3 year olds (occasionally rising 2 year olds), the majority of recent reported cases being Jersey or JerseyX, and often poorly-grown cows in mid-late pregnancy. Anecdotally, some farms have experienced cases over multiple years. Cases from both the North and South Islands have been reported, and no management-associated risk factors (including feed type) have been identified so far.

Pathology: In many cows, there is gross haemorrhage and rupture at the proximal gastrocnemius, often with haemorrhage and oedema extending down the muscle sheath into the calcanean tendon (which can appear haemorrhagic – this probably represents drainage from the proximal rupture). Deep dissection of the muscle group may be needed to avoid missing the rupture site. Histology of the CNS and the sciatic nerve at all levels is unremarkable. Skeletal muscle histology is unremarkable (e.g. no inflammation or degeneration indicating primary myopathy) except at sites of gross haemorrhage/rupture, where expected inflammation/haemorrhage/fibrosis are observed. Histology of collagen is unrewarding; other collagen assessment methods have not been performed but could be considered.

Treatment and disease progression: Once full-blown disease has developed, options for treatment are nil in our experience. In less-affected cows (with mild shifting lameness), rest and decreased effort and distance of walking seems to allow partial to full recovery of affected animals. In the cases MPI has investigated recently (around 8 "outbreaks" over 2015, mostly clustered in winter), between 1 and 25 animals (about 1-10%) are affected by initial mild lameness but only a few tend to progress to "crawling", recumbency or other signs requiring euthanasia. On one farm which we

investigated, 25 heifers developed mild, shifting lameness with a stiff gait. Of these, only two developed severe disease over subsequent weeks, with severe bilateral dropping of the hocks in both cows and floating/flying scapulas in one cow (Figure 2).

Predisposing conditions are variable, but during the recent winter, cases were reported following severe cold fronts; cows grazing crops in thick mud; and following unusual exertion (e.g. stampede). Other cases occurred without any apparent stressful event. Cold and/or snow was also noted to play a role in a cluster of cases which occurred following the June 2013 storm.

Working hypothesis: At present, the best possible explanation involves cows with weak or compromised connective tissue attachments, with added stress (pregnancy with added weight and connective tissue-relaxing hormones, cold, deep mud or stampede), and subsequent muscle/tendon breakdown resulting in progressive lameness.

Possible causes: No cause is known. Possible neurotoxins including mycotoxins and botulinum toxin were tested in early cases, with equivocal results (see March, '13 DCV Newsletter update for more details). Some 2015 cases were low in copper, which is intriguing since copper is essential for collagen formation. However, past copper status (during growth), rather than current copper status, would be needed in order to prove a causal link. Nevertheless, copper supplementation of young stock might be something for vets to consider on affected farms. The role of genetics is being investigated, with help from Livestock Improvement Corporation.

Case collection: We have been able to gather and provide the above information with the generous help of the vets and farmers involved in these outbreaks. If you see an outbreak, no matter what size, we are keen to hear from you. Every additional case helps to paint a picture of this mysterious syndrome and to provide clues to effective management and prevention.

To report a case/outbreak of Dropped Hock Syndrome to MPI, please send the following to Kelly Buckle (Kelly.buckle@mpi.govt.nz):

- a good-quality 10-30 second video clip of an affected cow
- still photograph of an affected cow
- completed questionnaire, pdf available at:
<http://www.mpi.govt.nz/document-vault/14443>

and please collect and hold:

- a blood sample (EDTA preferred) or skin to be stored chilled at 4°C for possible genetic testing (hold pending case evaluation)

Published originally in Dairy Cattle Vets Newsletter Dec 2015 (v33 number 2).



Figure 1: Rising three year-old with the characteristic “parked-out” stance of Dropped-Hock Syndrome (formerly known as Sciatic Palsy). Photo courtesy of Mark O’Callaghan, The Cow Vets.



Figure 2: Rising three year-old from the farm with 25 mildly-affected heifers. This was the only animal to develop severe disease. Note dropped hocks and raised up (“flying”) scapulas characteristic of Dropped Hock Syndrome (formerly known as Sciatic Palsy). Photo taken from a video provided courtesy of Natalie Rangihika, Hauraki Vets.