

Winter death syndrome is found in many tropical and temperate deer species in New Zealand, Australia, Scotland, and Europe. It occurs mainly in late winter on farms from lowlands to high country.

The condition is baffling because generally a farmer finds a deer dead without signs of struggling or scouring, and post-mortem and laboratory findings are negative.

Throughout New Zealand all age groups are susceptible, although stags seem more so than hinds. Often more than one animal is found dead — as many as six deer have died in one night.

The syndrome, which is most prevalent during long severe winters, is in effect an exposure/starvation syndrome.

### Causes

It is thought deer may experience a greater intensity and duration of cold stress than cattle or sheep during the winter, and have lower energy reserves to cope with it.

Cold stress may be induced with cold, rain, wind, or a clear overhead sky. All these reduce body heat, which is maintained by the deer using energy obtained from stored carbohydrate and fat.

In the winter, deer, and stags in particular, may have no reserves of carbohydrate and fat. They must then obtain energy either directly from the food they take in, or from catabolising protein — a process that is slower than using stored carbohydrate and fat.

The undesirably low energy level in winter is due to activities in the late autumn roar and rut. While establishing dominance and mating, stags lose up to two kg of body weight a day. They fail to replace this lost body weight during winter because they feed only to maintenance level; they fill their rumens to about a third of their normal intake, even when good feed is available.

In addition, deer have a high metabolic rate, and food passes down the intestine faster than in sheep and cattle, which contributes to reduced food absorption.

The negative, or near-negative energy balance can only be rectified if deer eat high energy food after the mating season has finished. This is difficult to achieve through a reduced feed intake.



Fig. 1: Stags eating grain during winter.

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## Winter Death Syndrome In Deer

### Exposure and Starvation

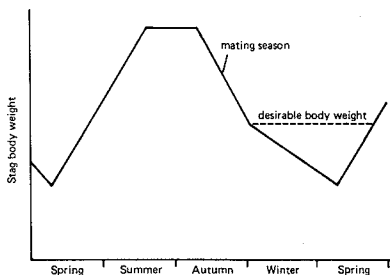


Fig. 2: Seasonal changes in stag body weight (diagrammatic).

Histologically, the livers are not clogged with mobilised fat, and thus are not in a ketotic state. It would appear, therefore, that an affected deer is in fact suffering from hypoglycaemia.

### Diagnosis

Diagnosis depends on the negative results of tests for all other diseases. It is confusing, because of the lack of symptoms and post-mortem signs.

### Prevention

Deer should have shelter, such as hedges to protect them from cold winds, and trees or sheds to reduce heat loss on clear nights.

Farmers should give stags high energy foods, such as hay, nuts and grain (Fig. 1), to prevent the body weight of stags from falling, and to try and keep it at the desirable level (Fig. 2).

The recommended amount of grain is 1½–2 kg per animal per day. The grain should be introduced slowly to the animals and should be poured on the ground in long lines so all deer have access to it. Dominant stags tend to gorge and keep other deer away if troughs are used.

Glucose, like grain, is a high energy food, and can be fed to sick deer possibly suffering from the syndrome.

If a sick deer is found and recovers, it should get a high carbohydrate diet and access to shelter for possibly a month or more, to prevent a relapse.



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