

VITAMIN A AND E DEFICIENCY IN A CATTLE FEEDLOT

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A combined deficiency of vitamin A and E was diagnosed in finisher cattle in a 12,000 head **feedlot** producing beef for the Japanese market. It was estimated that approximately 2,000 cattle were affected at any one time (i.e. cattle between 220 and 300 days in the **feedlot**). The diet was based on grain and corn silage and although each animal had been injected with 1,000,000IU vitamin A and 100IU vitamin E at the time of entry, there was no additional supplementation.

The clinical condition became obvious in the summer months. Animals were noticed to be suffering from clear ocular and nasal **dicharges**, swollen hind legs, varying degrees of lameness and **inco-ordination**, exophthalmus, 'glazed' bluish appearance to the eyes, poor adaption to dull light with pupils more dilated than normal and occasional cases of complete blindness. In advanced cases the swelling or oedema in the hind legs progressed to include oedema of all four legs, and extended to the shoulder and under the jaw. A number of affected animals were also seen to have corneal **ulcerations**, possibly as a result of injuries incurred through poor vision. Affected animals also showed a poor tolerance of hot weather. Their body temperatures were above normal in the middle of the day (ambient temperature 23.8°C) when compared with unaffected cattle. This was associated with increased **respiration**, **drooling** of saliva and occasionally panting. When observed in the cool evening these same animals showed no evidence of heat stress. Deaths of clinically affected animals occurred during hot weather and during prolonged transportation.

Pathological findings consistent with vitamin A deficiency included **squamous metaplasia** of the parotid salivary duct and papilloedema of the optic nerve. Grossly and histopathologically oedema occurred in **subcutaneous** tissue, within muscle bundles and within nerve bundles. **Microangiopathy** was identified in association with and probably as a cause of the oedema. It has yet to be ascertained as to whether the **microangiopathy** was due to low vitamin A or E, or both.

From severely affected animals both serum and liver levels of vitamin A and E were below normal. Serum levels of both vitamins were measured in relation to "days on feed". Both levels dropped with time, with vitamin A dropping to its critically low level at approximately 180 days and vitamin E not dropping to its accepted low level. From liver samples collected at slaughter, **vitamins A and E** were deficient.

Following the commencement of oral supplementation at a rate of 40,000IU vitamin A, 11.2IU vitamin E per head per day, the clinical condition disappeared and serum vitamin A levels rose above the critical level.

Vitamin A and E requirements are high for rapidly growing animals and **may** be particularly high when the preference is for marbled meat with a high fat content. The requirement for vitamin A is greater in hot weather **and** it is conceivable from our observations that either vitamin A or E or both are required for effective thermoregulation.

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