

Ionophore Toxicity

Sensitivity to the toxic effects of ionophores varies markedly between species with horses being particularly sensitive and cattle and dogs less so. Clinical signs of toxicity are relatively non-specific and include anorexia, depression, reluctance to move, dyspnoea, ataxia and recumbency. Diarrhoea is common in cattle but is not a feature of toxicity in dogs and horses. The time to onset and severity of clinical signs is dose dependent.

In cattle, anorexia occurs early whereas diarrhoea and depression can take up to 5 days to develop. Tachypnoea, ataxia and death without struggling may occur in animals ingesting very high levels. In survivors, signs of cardiac insufficiency may occur by 7 to 10 days.

Dogs ingesting ionophores often show signs over days to weeks, however, sudden death may occur if the ingested dose is very high. Muscle damage occurs over one to two weeks following ingestion, and as such muscle enzyme activities may not be elevated initially. While dogs may develop congestive heart failure, skeletal muscle rather than cardiac muscle is targeted.

In horses, anorexia may be followed by weakness, muscle tremors, ataxia, sweating, colic, diarrhoea, dyspnoea, myoglobinuria and recumbency with frequent attempts to rise. On examination tachycardia, a jugular pulse and arrhythmias may be detected.

Laboratory Findings

There are generally no abnormalities in the CBC, and CK and AST are not consistently elevated.

The severity and distribution of lesions seen on PM depend on species, dose, and time from ingestion. Animals that die acutely may not have obvious lesions and muscle damage is more likely to be found in animals that survive longer than 48hours.

Samples to Submit in Cases of Suspected Toxicity

As ionophores have different target muscles depending on the species, submit the following samples:

Species	Muscle(s)
Cattle	Cardiac & skeletal muscle*
Dogs	Skeletal muscle
Horses	Cardiac muscle
Pigs	Skeletal muscle
Poultry (chickens, turkeys)	Cardiac & skeletal muscle
Sheep	Skeletal muscle

*Skeletal muscle: Hindlimb muscles and diaphragm