

# CASE REPORT

## Acute Salt Poisoning in Cattle

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TABLE I  
COMPOSITION OF PROTEIN SUPPLEMENT  
CONSUMED BY COWS THAT  
SUBSEQUENTLY DEVELOPED  
SIGNS OF ACUTE SALT  
POISONING

Crude Protein (%)	32.0
Calcium (%)	3.0
Phosphorus (%)	0.9
Fluorine (%)	0.036
Iodine (%)	0.0012
Iron (%)	0.035
Salt (%)	5.0
Crude Fat (%)	1.0
Crude Fibre (%)	12.0
Vitamin D (i.u.)	2,500

### Introduction

Salt (NaCl) poisoning in livestock is a problem in areas where animals depend on saline water sources or when a sudden change to saline water from fresh water has occurred (12, 13). Excessive ingestion following a period of salt deprivation has resulted in deaths of cattle (15). Poisoning has occurred as a result of excessive salt in prepared feed (2).

Central nervous system and digestive tract derangement are the main features of acute salt poisoning in cattle (10). The toxicity of sodium is directly related to water intake; therefore, in order to substantiate a diagnosis of salt poisoning, there must be evidence of water deprivation in addition to consumption of unaccustomed amounts of salt (4). When large amounts of salt (up to 0.77 kg/day) were included in the ration, cattle performed satisfactorily, provided there was free access to fresh water (9), whereas 0.9 kg of salt and 13.5 ℓ of water administered to a cow deprived of feed and water for 36 hours produced nervousness, trembling and incoordination. (14).

Diagnosis of salt poisoning is based on history of limited water intake and access to unaccustomed amounts of salt. Laboratory procedures include serum and cerebrospinal fluid sodium levels (over 160 mEq/l), analysis of feed and water for NaCl (4) and histopathological confirmation of cerebral edema (7).

This paper reports on salt deprived cows which had broken loose and consumed an excess of a protein supplement containing 5% NaCl.

### History

In November 1972, a cow-calf operator in east central Alberta reported that six mature Hereford cows had broken into a storage shed and consumed approximately 50 kg of a protein supplement (Table I). The cows' normal ration consisted of hay and straw without supplemental mineral or salt. The cattle were allowed access to water once daily in the evening. Immediately

after the cows had eaten the concentrate, they were allowed access to water. Four hours later, the six cows were exhibiting signs of central nervous system derangement.

### Clinical Findings

Two of the six cows were in right lateral recumbency and had severe rumen tympany. Any sound, movement or attempt to manipulate the cows elicited tetanic convulsions with marked opisthotonus and horizontal nystagmus. These episodes were followed by mild clonic convulsions accompanied by champing of the jaws and generalized tremors of the skeletal muscles. Both animals died after convulsive episodes; one while an attempt was being made to pass a stomach tube. The other four cows had slight posterior ataxia and hypersensitivity to noise and touch. They were not blind. Ten hours after ingestion of the supplement these cows stood with their heads down and necks extended and exhibited mild generalized tremors of the skeletal muscles. Twenty-four hours later the cows were normal except for a mild diarrhoea. Treatment was not administered to any of the animals.

### Laboratory Findings and Diagnosis

The brain from cow no. 1 and rumen material from both cows were submitted for laboratory examination. The contents of the rumen were analyzed (Table II). A histopathological examination of the brain revealed evidence of moderate edema. A diagnosis of acute salt poisoning was made on the basis of clinical signs, history of restricted water intake, salt deprivation and sudden access to excessive quantities of salt. The histopathological findings of cerebral edema confirmed the clinical diagnosis.

### Discussion

This case of ingestion of a protein supplement containing 5% salt by cattle deprived of supple-

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**TABLE II**  
ANALYSIS OF RUMEN CONTENTS FROM TWO COWS THAT DIED FROM ACUTE  
SALT POISONING

Animal	NaCl (Dry Weight) %	NaCl (Wet Weight) %	Moisture %	pH
1	5.3	0.37	93	5.5
2	1.73	0.23	87	5.5

mental salt and watered only once daily illustrates the potential hazard to susceptible animals of an otherwise innocuous feed ingredient. The signs exhibited by these animals were consistent with those described for the acute syndrome (2, 6, 8, 13, 15, 16). Paresis and knuckling followed by recumbency without convulsions has been reported (12). Acute neurological derangement with similar signs has been described in sheep (11, 16). Rumen sodium and chloride levels vary considerably and depend on the amount and physical form of ingested salt, time between ingestion and laboratory examination and the water intake following ingestion (3). A rumen NaCl level of 0.5% was reported in fatal cases in cattle (15) while levels of 0.36 and 0.4% have been found in fatal cases in sheep (16). The difficulty in establishing the normal level of rumen sodium and for any particular circumstances or ration (1) diminishes the diagnostic value of rumen NaCl levels. The low rumen pH (Table II) in both cases represents only a moderate degree of abnormality due to ingestion of the protein supplement. The influence of this on the severity and rapid onset of clinical signs would be minimal.

#### Summary

A case of sodium chloride poisoning is described in which two of six animals died following accidental access to a protein supplement containing 5% salt. Central nervous system derangement was the predominant sign. The etiology and diagnosis of this toxicosis are discussed.

#### Résumé

L'auteur décrit un cas d'empoisonnement par le chlorure de sodium qui entraîna la mort de deux des six vaches qui avaient accidentellement consommé un supplément protéique contenant 5% de sel. Les principaux signes cliniques reflétaient une atteinte du système nerveux central. L'auteur commente aussi l'étiologie et la diagnostic de cet empoisonnement.

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