



# Botulism diagnostics for animal

Tonie E. Rocke

USGS National Wildlife Health Center



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## Botulism in birds



# Major type C botulism outbreak

Utah and California	1910	Millions
Lake Malheur, Oregon	1925	100,000
Great Salt Lake, Utah	1929	100-300,000
Tulare Basin, California	1941	250,000
Tule Lake, California	1948	65-150,000
California	1969	140,000
Montana	1970	100,000
Great Salt Lake, Utah	1980	110,000
Caspian Sea, USSR	1982	1 million?
Alberta, Canada	1995	100,000
Manitoba, Canada	1996	117,000
Saskatchewan, Canada	1997	1 million
Great Salt Lake, Utah	1997	514,000

## Threatened or endangered waterbirds at risk for botulism



# Botulism in domestic animals



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# Botulinum serotypes found in animals

<u>Types</u>	<u>Animals affected</u>
A	domestic poultry
B	horses, cattle
C	waterfowl, poultry, cattle, horses, min
D	cattle
E	fish, fish-eating birds

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## Mouse bioassay – primary diagnostic test



## Animal botulism testing in U.S.

NWHC: ave. 302 tests/year  
C (83%), E (17%)  
wild birds (95%), cows, horses, other mammals (5%)

U Penn: ave. 594 tests/year  
B (62%), E (24%), C (10%), A (4%)  
horses (33%), wild birds (28%), cows (13%), poultry (12%)

USDA: ave. 6 tests/ year

State Dx Labs: unknown

# Alternative diagnostic methods used for botulism diagnosis in animals

## -PCR

(Chaffer, et al., 2006. J Vet Med B Infect Dis Vet Public Health. 53(1):45-7;  
Nol, et al., 2004, J. Wildl. Dis. 40:749-753)



## -Type C Immunostick ELISA

(Rocke, et al., 1998, J. Wildl. Dis. 774-751)



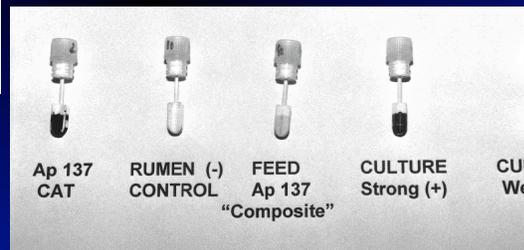
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# Example: 1998 Type C botulism outbreak in California dairy cattle herd



Galey, et al. 2000 J. Vet. Diag. Inv. 12:204-209



 USGS

NWH

## Example: 1995 Type C botulism outbreak in California bighorn sheep



Swift, et al. 2000 J. Wildl. Dis. 36:184-189

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## Requirements for botulism diagnostic tests for animals

- indicative of active toxin
- easy to use and adapt to field or remote laboratory
- inexpensive and rapid
- effective for environmental samples and carcasses as well as live animals

