Poisoning in Wild Birds

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Toxins

- Many in environment
  - natural
  - man made

- Signs are often non-specific
- Birds more sensitive than mammals

Operation Cleansweep

- Fl EPA- 1995-2011
- Collected 700 T
  - cancelled, unusable pesticides
  - 2000 paticipants
  - 66 counties

Poisoning

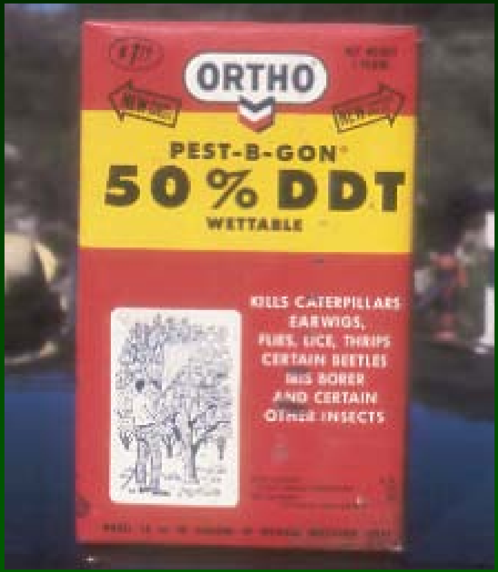
- May be intentional
  - legal issues if protected species
- May be primary or secondary
- History is important for diagnosis
- May affect one or many birds

How poisoned

- By ingestion
  - granular formation
  - eat poisoned prey or treated seed
- By being sprayed
  - absorption through skin
  - Inhalation also possible
- Absorption through feet
  - poisoned perches

History very important

- Where found?
  - around houses
  - in farm fields
  - near industrial areas
  - near water



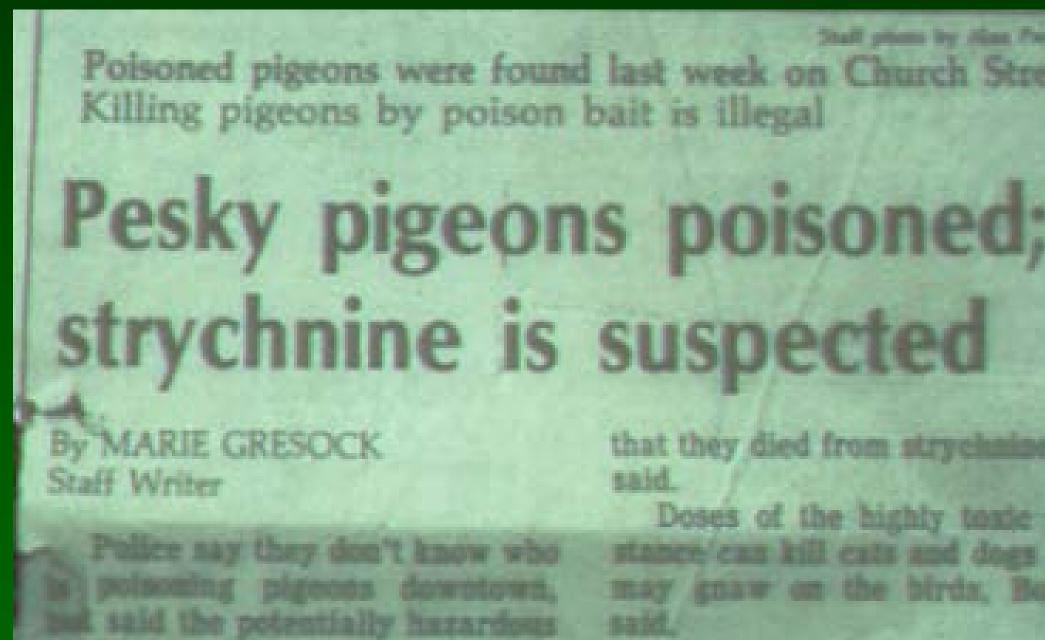
- History of toxic being used
- Any indication of toxics?
- Species and # affected?
- Other animals affected?

Bodies hard to find

- Carcasses quickly removed by scavengers
- FWS study-
  - 11% of planted bodies recovered from 6 acre field by trained searchers after 48 hours

85% HHs have them

Intentional poisoning



Poisoned pigeons were found last week on Church Stre
Killing pigeons by poison bait is illegal

Pesky pigeons poisoned; strychnine is suspected

By MARIE GRESOCK
Staff Writer

Police say they don't know who is poisoning pigeons downtown, but said the potentially hazardous

that they died from strychnine, said.

Doses of the highly toxic s stance can kill cats and dogs t may gnaw on the birds, Bo said.

Physical exam

- Always should be thorough
- Signs often vague
  - may look like other problems
  - often in good flesh
- Nervous system often involved
  - convulsions, depression, twitching
  - can history explain signs seen?
- Poisoned bird may also be injured

Other diagnoses?

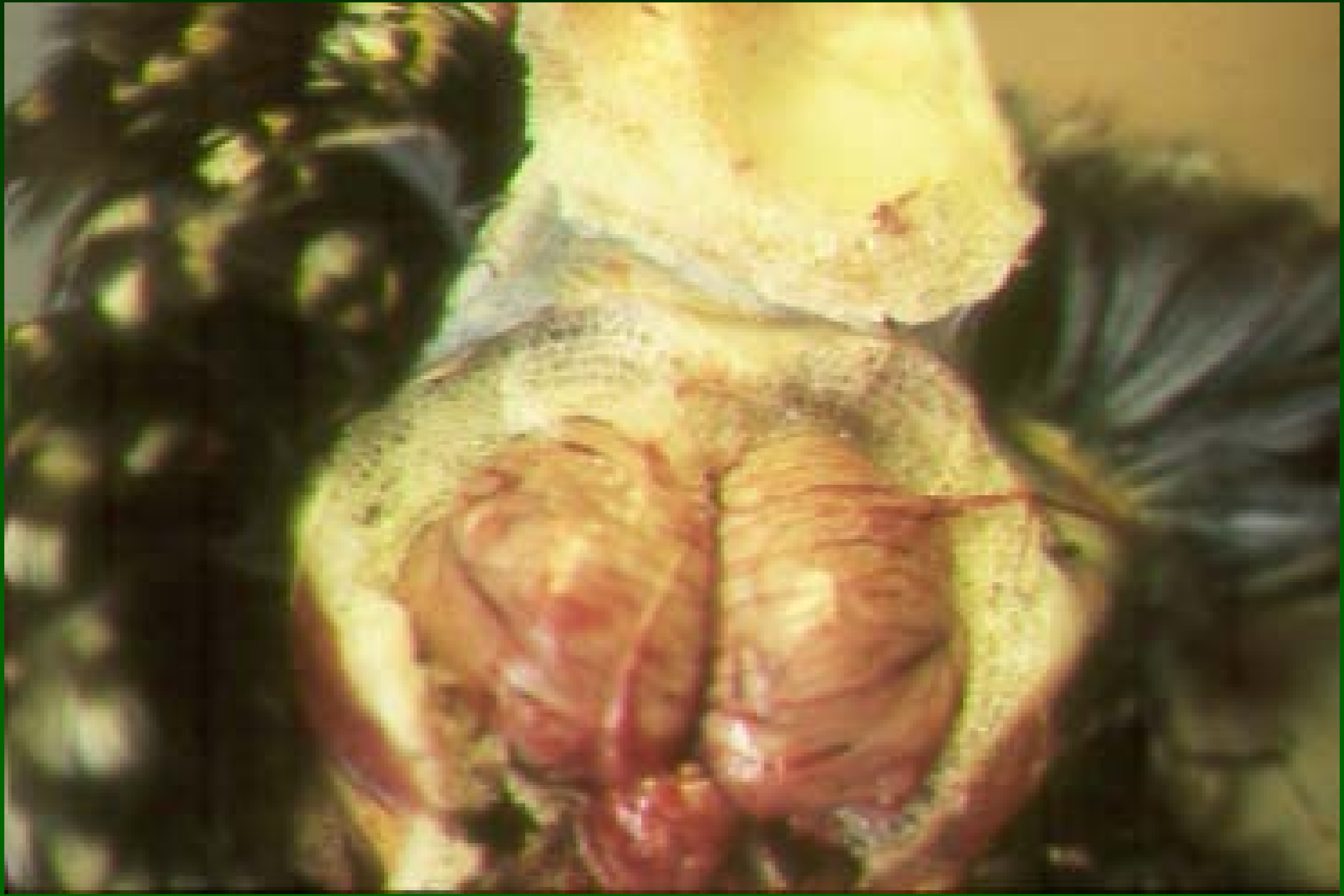
Testing for toxins

- Need index of suspicion for tests & treatment
- Potential sample
  - blood
  - urine
  - tissues
  - gi contents

Testing for toxins

- Sample needed & test used determines how it is handled
  - anticoagulant
  - refrigeration
  - freezing
  - preservative
- Check with the lab beforehand

Check the brain on PM or for testing



Places to go for help

- State wildlife agency
- USDI
- University, state, federal labs
- Private environmental testing labs
- National Wildlife Health Center

Most common toxins

- Botulinum
  - kills more birds than any other
- Cholinesterase inhibitors
  - used to kill nematodes/insects
  - organophosphates/carbamates
- Lead

Lead/Zn poisoning

- Waterfowl & raptors
- From lead shot, fishing weights…
- May see on rads
- Or run blood Pb
  - levels >0.3 ppm or 30 mcgm/dl

Common signs

- Ataxia
- Bright green feces
- Depression
- Impacted crop
- Droopy wings
- Voice change
- Pale membranes
- Anorexia
- Death

Treatment

- 35 mg/kg calcium versinate bid IM or IV for 5 days
  - retest weekly
  - 5 day tx lowers levels by 50%
- Remove lead by lavage
- Supportive therapy

Botulism

- Kills 100,000's waterfowl/yr
- Disease of water's edge
- Proper disposal important

Botulism

- Birds ingest paralyzing toxin of Clostridium botulinum type C
- Incoordination, paralysis of legs and wings, can’t hold up head, dyspnea, drown
- Supportive therapy essential

Pesticides

- Over 21,000 registered formulations by EPA
- Annually 1,100,000,000 pounds used in U.S.
  - homes, farms, forests, roadways, businesses
- Less than 0.01% reaches target pest
- Lower the LD_{50}, the more toxic

Common pesticides

- Organophosphorous compounds
- Carbamate compounds
- Chlorinated hydrocarbons
- Coumarin containing rodenticides

Cholinesterase inhibitors

- Include organophosphorous and carbamate compounds
- Over 82 compounds in 4600 products
- Sold as powders, granules, sprays, impregnated perches

Highly toxic

- Thiofanox
- Terbufos
- Propaphos
- Carbofuran
- Phorate
- Parathion
- Quinalphos
- Dicrotophos
- Monocrotphos
- Aldicard
- Fenamiphos
- Isofenphos

More toxic ones

- Famphur
- Isazofos
- EPN
- Diazinon
- Coumaphos
- Mevinphos

- Bendiocarb
- Oxamyl
- Disulfoton
- Cyanophos
- Fenthion
- Triazamate

Clinical signs

- Ataxia
- Depression
- Can’t stand or fly
- Salivation
- Abnormal body posture
- Convulsions
- Difficulty breathing
- Muscle twitching
- Spastic nictitans
- Death

Affected birds

Argentina horror story

- Winter 1995-96, ~20,000 Swainson's hawks killed in Argentina
- Ate grasshoppers contaminated with monocrotophos
- ~100,000 earred doves killed in '97
- Pesticide banned in Argentina in '99
- Novartis w/drawing product
  - also made by other companies

Diagnosis

- History of exposure
- Depressed CHE levels in blood
  - compare to normal of same species
  - levels back to normal in 72 hours
- Depressed CHE levels in the brain
- Identify compound from gi tract or liver

Treatment

- Atropine- 0.5-5.0 mg/kg IM
- Diphenhydramine-15 mg/kg IM
- Supportive therapy
  - empty crop if full
  - GIT protectant
- 2-PAM if OP- 20 mg/kg IM

Organochlorine compounds

- Most have been banned for years
- Long ½-life
- Stored in fat
- DDT, DDE, chlordane, dieldrin, endrin, heptachlor

Clinical signs

- Birds are often emaciated
- Tonic-clonic convulsions
- Anemic, hypoproteinemic
- Abnormal posture
- Death

Diagnosis

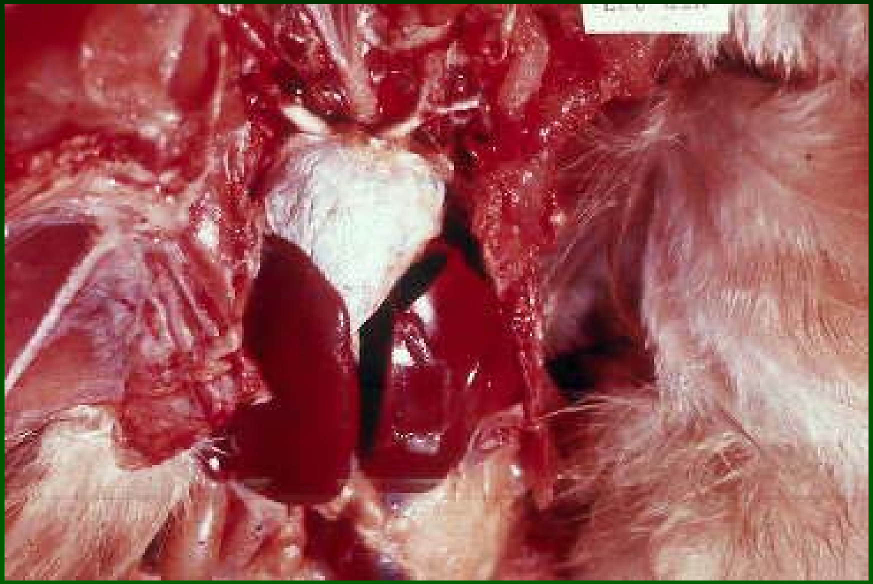
- Often classical clinical signs
- Tissues tested after the PM
  - brain best
  - test body fat if monitoring
  - normal values vary
- Histopath unremarkable

Treatment

- Need to support bird
- Aggressive therapy required
  - blood/plasma transfusion
  - anticonvulsants
  - parenteral nutrition
- No specific antidote

Avicides

- Used for pigeons, starlings, grackles mostly
- Some more deadly than others
- Often find multiple carcasses



Visceral gout due to renal failure

Avicides

- Require permit from USDA
  - a crime if protected species w/o special permit affected
- Avitrol®
  - 4-aminopyridine
- Starlicide®
- DRC-1339®

Neonicotinoids

- Imidacloprid, Nitroguanidine
  - Merit™, Premise™, GrubEX™
  - concentrate, granular
  - insect control on turfgrass, grains & ornamentals
  - single grain of treated wheat or canola will kill a songbird
- Tests not readily available

Fipronil

- Chipco Choice Insecticide®
- Highly toxic to upland game birds
  - non-toxic to waterfowl
  - metabolite more toxic to both
- Used on turf
  - degrades slowly in soil
- No readily available diagnostic test

Endocrine disruptors

- Chemicals which disrupt the endocrine system
- Seen with many compounds
- Many still need to be identified

Endocrine disruptors

- Dioxin
- PBBs
- PCBs
- DDT & DDE
- Chlordane
- Carbaryl
- Parathion
- Mirex
- 2,4-D
- Atrazine
- Benomyl
- Zineb

Effects seen

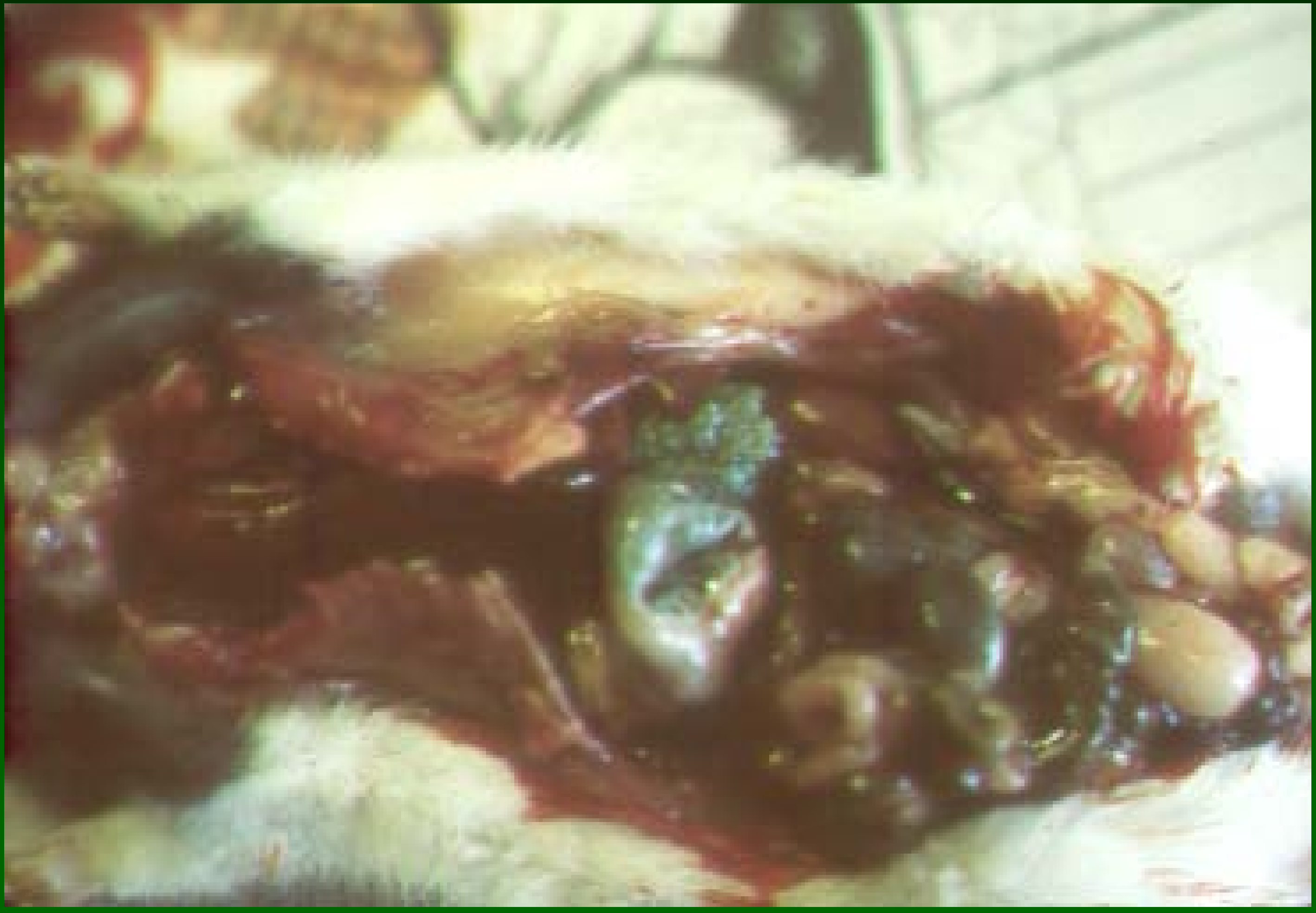
- Reproductive problems
  - $\Downarrow$ fertility & hatchability
  - $\Downarrow$ viability of young
- Immunosuppression
- Behavioral abnormalities
- Embryonic abnormalities
  - developmental defects

Deformities

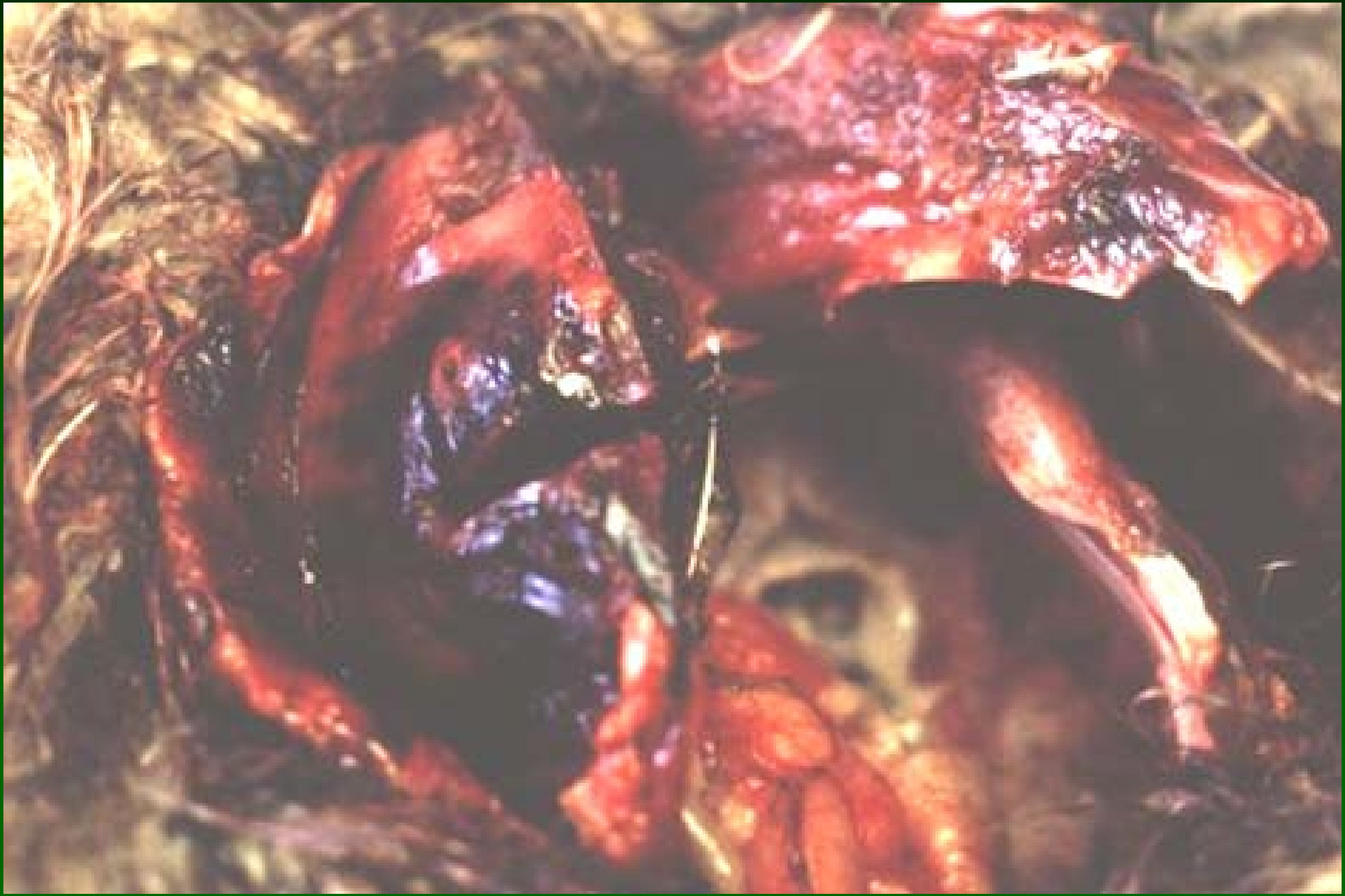
Rodenticides

- Two types used today
- Coumarin derivatives cause hemorrhage
- Cholecalciferol causes renal failure
  - Quintox, Tomcat, Terad 3
- Usually see in birds around homes, farms, or in captivity

Rodenticide in dead rat



Hemorrhage



Highly toxic rodenticides

- Flocoumafen
- Difethialone
- Brodifacoum
- Bromethalin
- Sodium fluoracetate

Anticoagulant-type

- Diphacinone, brodifacoum bromethalin more potent and last longer
- Vitamin K_1
  - may need blood transfusions
  - iron dextran
  - may need treatment for several weeks

Cholecalciferol

- May see depression, vomiting, PU, PD, anorexia, diarrhea
- Elevated serum calcium
- Provide parenteral fluid therapy
- Calcitonin, furosemide, pred
  - poor prognosis

Oiled birds

Western grebe

washing

Oiled birds

- Few-1000's
- Labor intensive
- Need space & hot water
- Dawn detergent
- Supportive tx

King eiders

Oiled birds

Secondary Pentobarbital Poisoning

- Euthanized carcasses
  - toxic to scavengers
- 139 Eagles killed
  - farm animals left out
  - other species affected
- May be intentional or accidental
  - still illegal

Other toxins

- Mercury
- Arsenic
- Selenium
- Thallium
- Strychnine
- PCBs
- Salt
- Nitrates
- Mycotoxins
- Algae toxins

Where do you start

- Learn about local problems
  - wildlife biologists, academics
- Network with others interested
- Spot check for common toxins
- Test patients which fit profile
- Confirm suspicions with data

What we can do

- Document poisonings
- Keep data and report findings
- Educate public and policy makers
- Encourage less pesticide use
  - most are overused
  - integrated pest management (IPM)
- Encourage use of less toxic pesticides

Useful References

- University of Fl, IFAS, Pesticide Information Office
- Noninfectious Diseases of Wildlife, ISUP, 1996
- Cholinesterase-inhibiting Insecticides, Elsevier Publishing, 1991

More references

- Environmental Contaminants in Wildlife:Interpreting Tissue Concentrations, Lewis Publishing, 1996
- Basic Guide to Pesticides, from Rachel Carson Council, 1992 (301-652-1877)