

IF IT WASN'T LIGHTNING OR PNEUMONIA OR THE FEED  
OR THE VACCINE, WHAT KILLED THE COW?



Brought to you by Paracelsus, **THE ANTIDOTE**, & Dr. Tim Evans



MU Veterinary Medical Diagnostic Laboratory

[evanst@missouri.edu](mailto:evanst@missouri.edu) 573-884-9270



 University of Missouri  
College of Veterinary Medicine





# TRUE OR FALSE:

☠ **EVERYONE** has an “enemy” who is out to poison their animals!!!  
**TRUE**

☠ **OLD** animals just don’t die suddenly unless they are poisoned!!!  
**TRUE???** **FALSE???**

☠ **UNLIKE PEOPLE**, livestock are supposed to warn us before they die!!!  
**TRUE???** **FALSE???**

☠ Liver enzymes are **ONLY ELEVATED** in intoxications!!!  
**FALSE**

☠ **MOST** cattle are killed by lightning, whether there was a storm or not!!!  
**FALSE**

☠ If there is **ANY** evidence of previous pneumonia, **THAT** killed the cow!!!  
**FALSE**

☠ Feed and Vaccine Manufacturers are out to poison our livestock!!!  
**FALSE**

☠ Some livestock producers think they are out to get their livestock!!!  
**TRUE???**

ACCIDENTS DO HAPPEN, BUT...

# LARGE ANIMAL TOXIC FACTS TO REMEMBER:

## ☠ Toxic Differentials for Blindness in Cattle:

- *LEAD*
- *SALT TOXICOSIS/WATER DEPRIVATION SYNDROME*
- *PEM (Sulfur)*

## ☠ Toxic Differentials for Sudden Death in Cattle:

- *PESTICIDES*
- *ARSENIC (with or without gross pathology)*
- *Cyanide*
- *Nitrate/Nitrite*
- *Urea (NPN)*
- *Neurotoxic Plants (Blue-Green Algae)*
- *Cardiotoxic Plants (Yew)*
- *Lead (expect some BLINDNESS)*

# POISONING SHOULD BE SUSPECTED WHEN:

- ☠ Signs of UNKNOWN ETIOLOGY/OTHER causes RULED OUT
- ☠ Sudden DEATH OF MULTIPLE ANIMALS/SIMILAR SIGNS
- ☠ Rapid onset of an AFEBRILE SYNDROME or, even, SUDDEN DEATH of a previously healthy animal.
- ☠ RECENT CHANGE in diet or environment
- ☠ NEIGHBORHOOD FEUDS/LOVE GONE BAD
- ☠ VERY SMALL, very YOUNG, very MEAN, very NOISY, very ANNOYING, and/or very STUPID animals!!!
- ☠ Alien, “Biker”, and Meth Lab sightings in the area!!!





# **WORKING UP A POSSIBLE INTOXICATION**

**NOT REALLY DIFFERENT FROM WORKING  
UP ANY OTHER CASE!!!**





# WORKING UP A POSSIBLE INTOXICATION 1

HISTORY/PHYSICAL EXAMINATION



CLINICAL SIGNS/CIRCUMSTANCES



# WORKING UP A POSSIBLE INTOXICATION 2

LIST OF PROBLEMS (WHAT'S WRONG???)



"BIG PICTURE" PROBLEMS (TARGET SYSTEM/ORGAN)



D.A.M.N.I.T. ➡ WHAT ABOUT THIS CASE SUGGESTS INTOXICATION?



IF INTOXICATION UNLIKELY, GO ANOTHER DIRECTION



OR

IF INTOXICATION LIKELY, PLAUSIBLE TOXIC/NOT TOXIC??? DIFFERENTIALS



MOST LIKELY FINAL TOXIC DIAGNOSIS AND WHY (MIGHT NOT HAVE ONE)



MIGHT NEED TO KNOW TOXIC MECHANISM OF ACTION



TOXICOSIS TREATED ↔ DIAGNOSIS CONFIRMED

RETHINK IF DIGNOSIS NOT CONFIRMED!!!





IN LESS THAN 100 WORDS:



## HOW TO CONFIRM DIAGNOSIS OF AN INTOXICATION ALIVE/DEAD

### ☠ CLINICAL SIGNS/CLINICAL CIRCUMSTANCES

☠ ID/EVALUATE CLINICAL SIGNS (Consistent with Specific Toxicosis)

☠ ID POTENTIAL TOXICANTS IN ENVIRONMENT (Water/Feed/Junk)

ALIVE (Potentially challenging and toxicosis-/target organ dependent)

### ☠ WHOLE BLOOD/SERUM/URINE/VOMITUS

☠ ID TARGET ORGAN BASED ON HEMATOLOGIC/BIOCHEMICAL  $\Delta$ s

☠ POSSIBLE ANALYSES FOR “TOXICANTS”, ESPECIALLY IN VOMITUS

## DEAD

### ☠ NECROPSY/HISTOPATH/+ or – TOXICOLOGY TESTING

☠ ID TARGET ORGAN BASED ON GROSS/HISTOPATHOLOGIC  $\Delta$ s

☠ ANALYSES FOR “TOXICANTS”

☠ FRESH/FROZEN GASTRIC (Rumen) CONTENTS, LIVER, KIDNEY

☠ ½ BRAIN IF NEUROLOGIC SIGNS

☠ OCULAR FLUID/CEREBROSPINAL FLUID/OTHERS



**HELP IS JUST A PHONE CALL AWAY!!!**

**573-882-6811**



## DIAGNOSIS OF SUSPECTED INTOXICATION:

- ☠ Collect **DETAILED & ACCURATE HISTORY**  
Consists of reported signalment + clinical signs/clinical circumstances
- ☠ Directly assess **CLINICAL SIGNS/CLINICAL CIRCUMSTANCES**
- ☠ **LIST OF PROBLEMS/DAMNIT/LIST OF DIFFERENTIALS**
- ☠ **TENTATIVE DIAGNOSIS/MOST LIKELY** differentials
- ☠ Correlate **MECHANISM OF ACTION** to **CLINICAL SIGNS/PROBLEMS**
- ☠ Evaluate the **EFFICACY OF TREATMENT** in progress.
- ☠ **CLINICAL PATHOLOGY** (especially if ALIVE)
- ☠ **NECROPSY EXAM/PATHOLOGY** (especially if DEAD)
- ☠ Collect **APPROPRIATE SAMPLES** for **ANALYSES**



# HOW TO MAKE THE MOST OF A NECROPSY TO CONFIRM A “TOXIC” DIAGNOSIS:

- ☠ AVOID ONE “MAGIC” SAMPLE APPROACH
- ☠ COLLECT & FIX TISSUES FOR HISTOPATH
- ☠ COLLECT FRESH/FROZEN TISSUES FOR TOXICOLOGY
- ☠ TAKE IMAGES OF ANIMALS/ENVIRONMENT/NECROPSY
- ☠ CONSULT AN “EXPERT”



## PROPER PRESERVATION/STORAGE:

- ☠ Fix **TISSUES** for **HISTOPATH** in **FORMALIN**.
- ☠ **CHILL/FREEZE VOMITUS & TISSUES FOR TOXICOLOGIC ANALYSES.**
- ☠ **IMMEDIATE FREEZING** is optimal if testing for **VOLATILE TOXICANTS**, such as ammonia, cyanide, zinc phosphide, or metaldehyde IN **RUMEN AND/OR STOMACH CONTENTS.**
- ☠ For Organochlorine Pesticides, **AVOID PLASTIC** containers if possible (might be unavoidable); **GLASS JARS/ALUMINUM FOIL ARE BEST.**
- ☠ **IF IN DOUBT**, check with laboratory **BEFORE** sending.



# SOME EXAMPLES FOR DISCUSSION

# LEAD





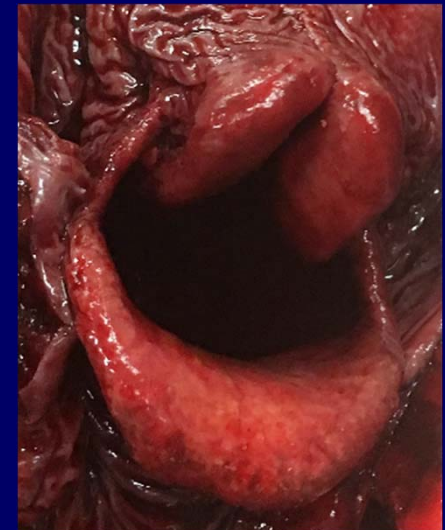
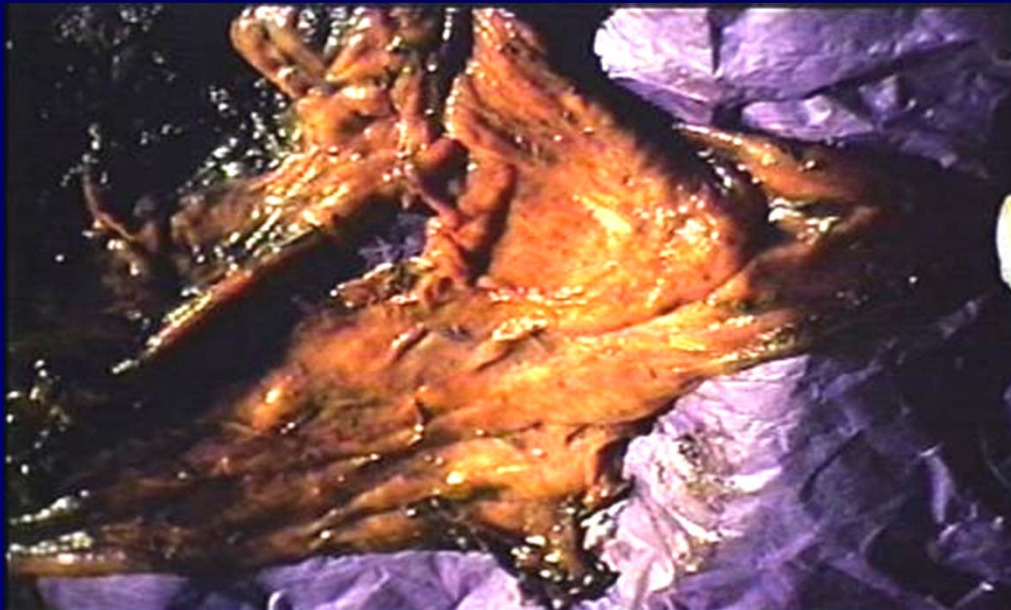
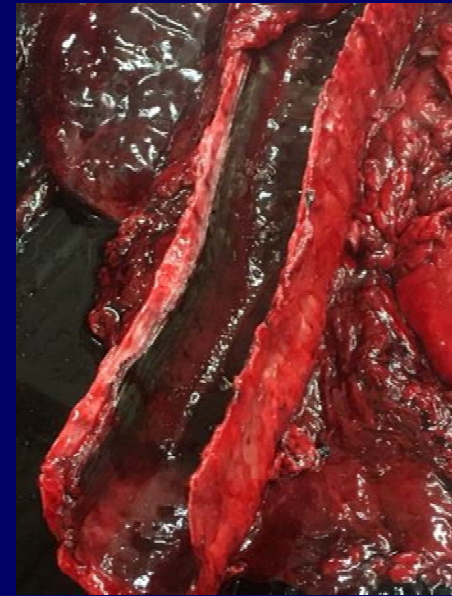






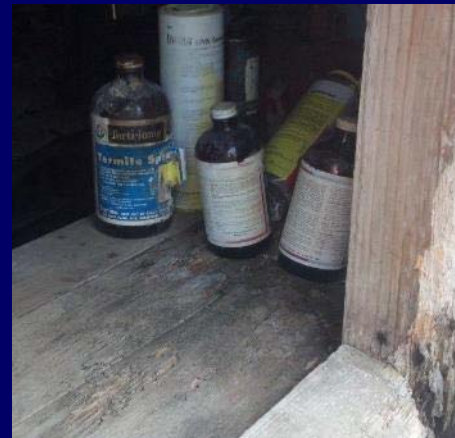
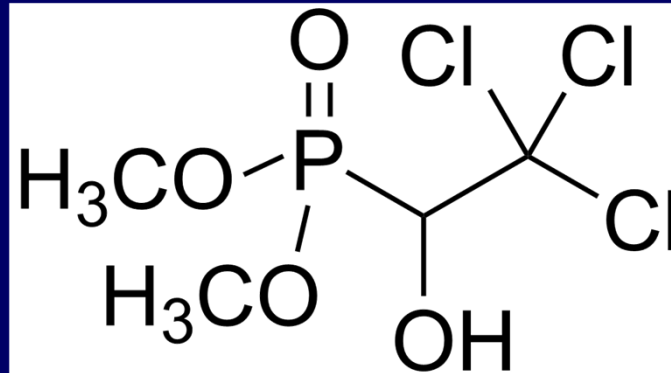
# ARSENIC AND BURN PILES







# OP AND CARBAMATE INSECTICIDES







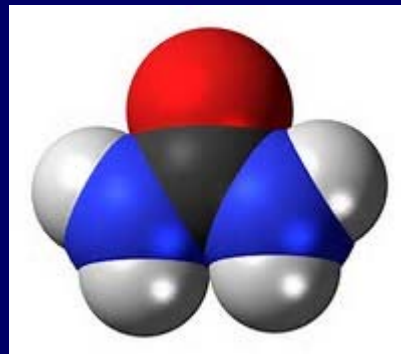
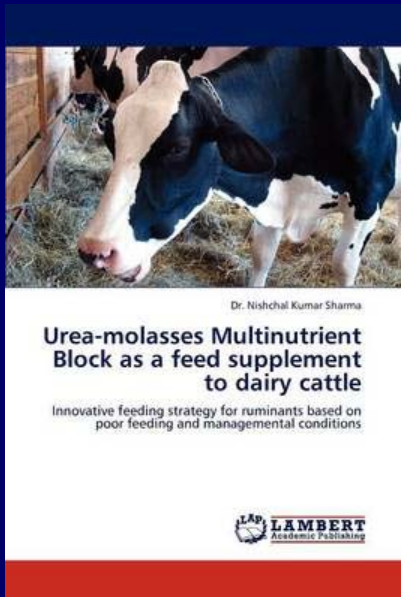




# ORGANOCHLORINE PESTICIDES



# NPN/UREA



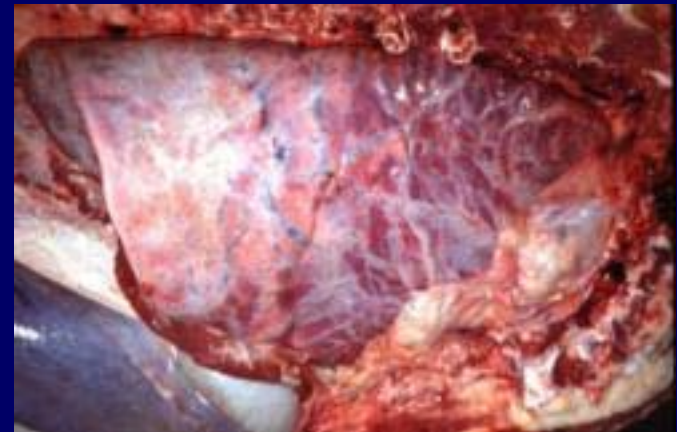
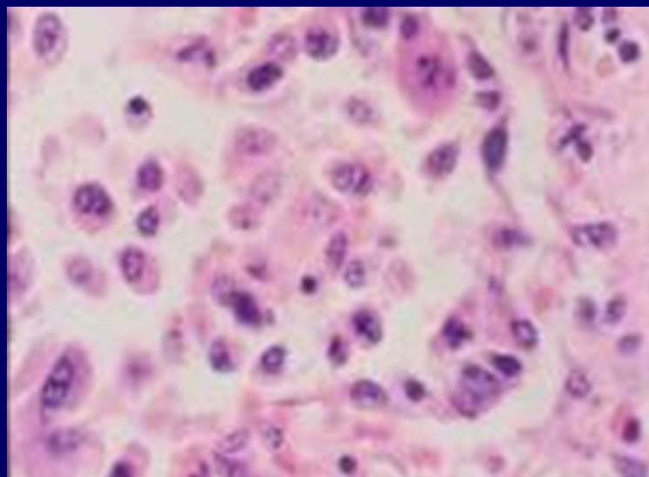
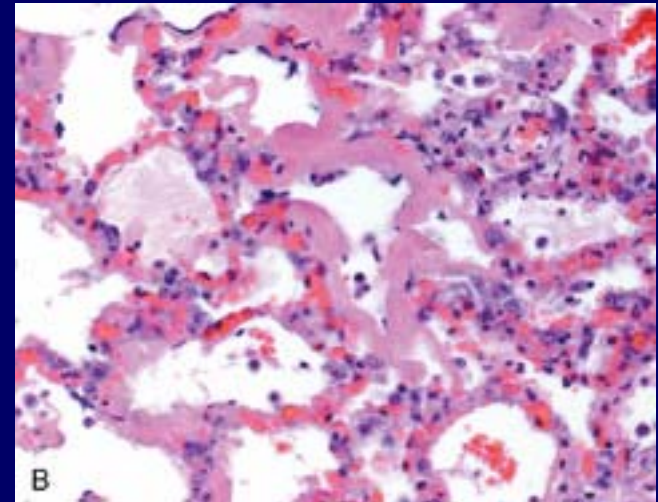


# PERILLA MINT







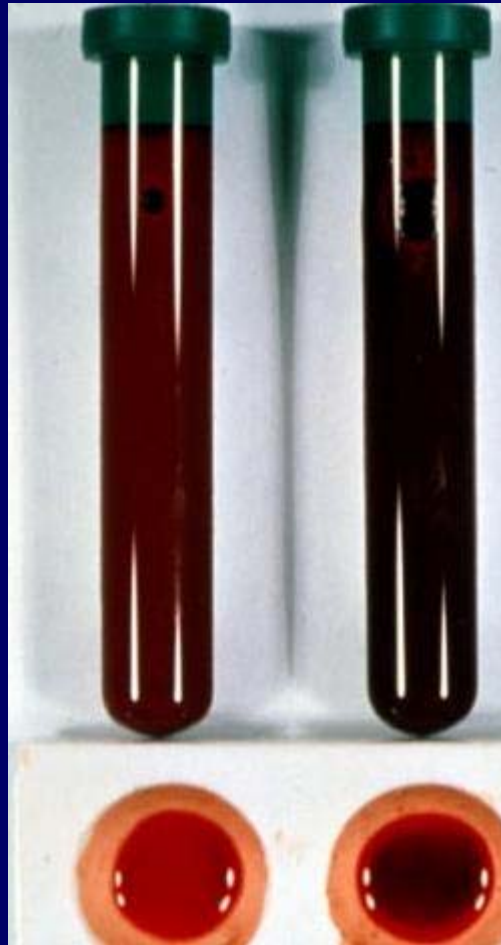






# CHERRY TREES

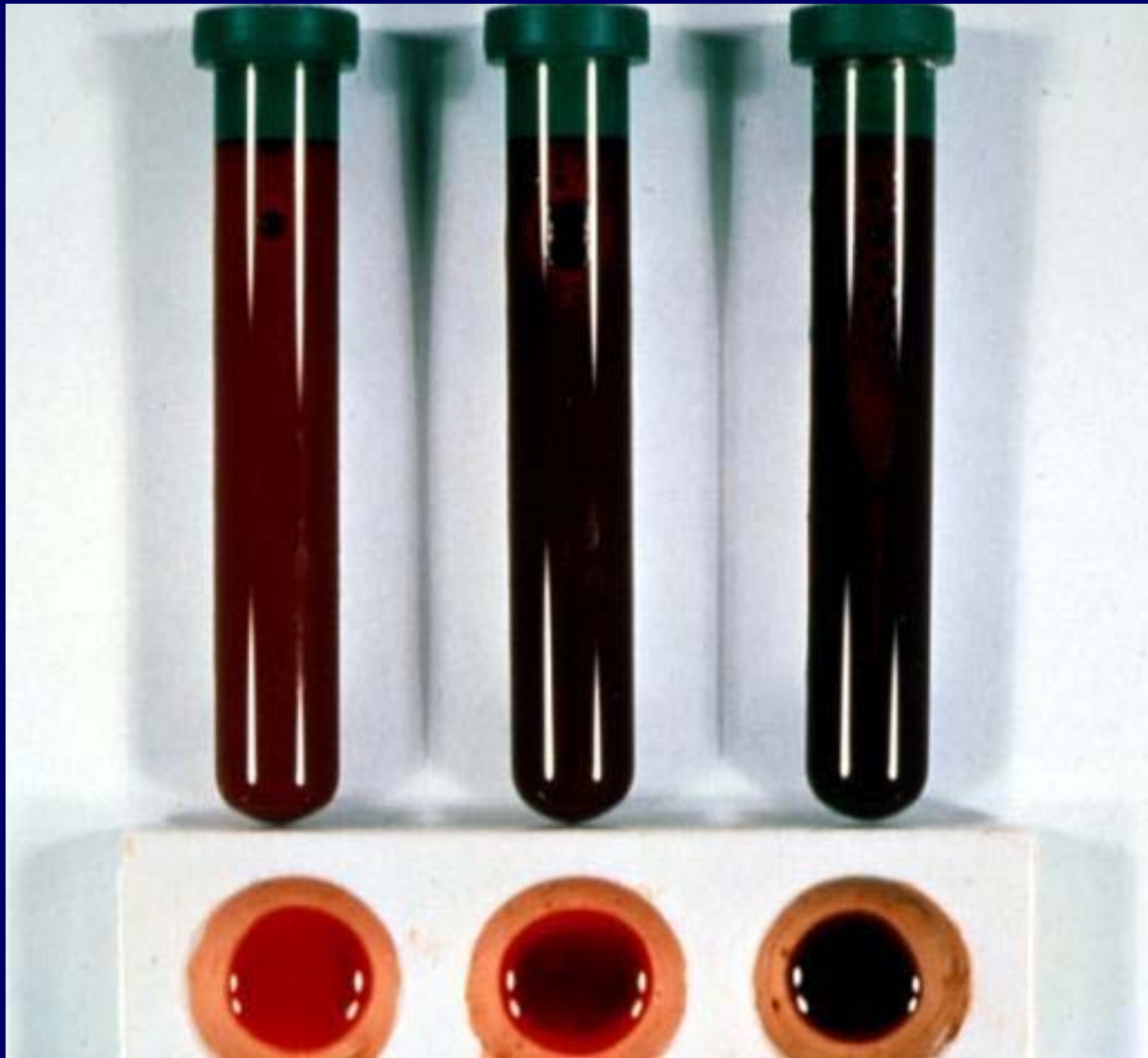






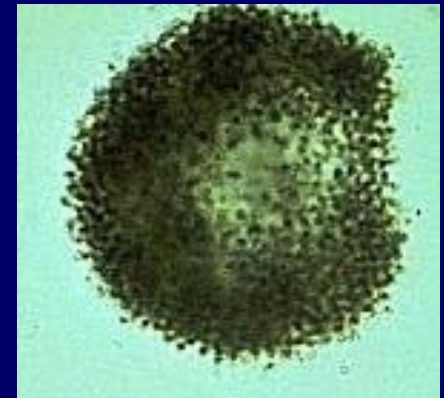
# JOHNSONGRASS







# BLUE-GREEN ALGAE





YEW











# POISON HEMLOCK













