TOXICITIES
COCCIDIOSTATS

• Before diagnosing a coccidiostat toxicity, ask which coccidiostat they are on.

• It is difficult to have a toxicity to something that is not there!
Coban

• Monensin, an ionophore, has been on the market since the early 1970's.

• It is generally not a problem if the birds are started on the compound at day 1; but if it is the second compound in a shuttle program, toxicity can occur even at the recommended levels of 90-110 ppm.
Coban

- Toxicity is characterized by paralysis with legs extended behind the bird in sternal recumbency.
- Birds are alert but cannot move. This is reversible in chickens but many may die.
- Turkeys are especially sensitive and can result in 75% mortality.
Coban

- The use of this compound tends to reduce feed consumption and weight gain.
- This is addressed by increasing the salt in the diet.
- Normal salt levels are 0.3% and are increased to 0.4-0.5% to improve weight gains.
- However, this can result in tibial dyschondroplasia.
Typical paralysis
Typical paralysis
Avatec

• Lasalocid: 75-125 ppm.

• This is also an ionophore but is the biological opposite of Coban.

• It is used in withdrawal feed.
Avatec

- When using Avatec the salt content of the diet must be reduced to levels of 0.25-0.27% or will result in wet litter.

- NaCl deficiency can result with poor weight gains and flock nonuniformity.
Avatec

- The most marked sign of toxicity is birds walking on their toes. This resolves when the feed is removed.

- This is used primarily in the summer because it enhances water consumption.
Toe walking
Nicarbazine

• This chemical is used primarily in the winter and is a very effective product at 125 ppm.

• The compound affects the broilers ability to regulate body temperature and can cause heat prostration if used during warm weather.
Nicarbazine

- The compound is electrostatic, so adheres to the side of the feed mill.

- If even a small amount (20-30 ppm) gets into breeder feed, it will cause a loss of pigmentation of the egg shells - brown eggs turn white, fertility will decrease by one-half and cause a reduction in hatchability.
Loss of pigmentation
Nicarbazine

• It will take 4-6 weeks for the fertility to return.

• Because of this many companies will mix hen feed on one day and dedicate a truck to delivery.
Zoalene

- This is only used in pullets (at 40-125 ppm) because it is a weak coccidiostat which allows immunity to develop.
Zoalene

• When toxicity occurs the birds behave as if they hear a far-off noise by cocking their heads sideways.

• The birds may circle and fall forward.

• Eating and drinking will be diminished.
Zoalene

- The birds are very excitable and tend to pile up.
- The birds will recover within hours of removal of the feed.
Head cocking, excitability
Head cocking
MINERALS
Calcium

- Increased calcium levels in the diet will reduce growth. Excessive levels can result in tetany and convulsions.

- High calcium levels can cause a relative phosphorous deficiency.

- Normal levels in broiler rations is 0.8-0.9%.
Calcium

• High levels will affect the kidneys causing a severe nephrosis.

• Severe dehydration will result causing high mortality.

• This results in uric acid accumulation which fills the ureters and deposits on the surface of the viscera.
Reduced growth
Abnormal growth plates
Uric acid deposits
Uric acid deposits
Phosphorous

- Dicalcium phosphate is commonly added to the feed. It is grey in color and so birds will pick it out of the feed.

- Limestone is another source of phosphorous.
Phosphorus

• Calcium and phosphorus must be in the ration in a balanced ratio.

• An excess of phosphorus can result in a relative calcium deficiency.
Phosphorus

- It is similar to calcium toxicity since both are eliminated through the kidneys in a balanced manner.

- Rickets can result and birds become stunted.
Dicalcium phosphate pellets
Sodium Chloride

- Salt toxicity is the most common toxicity seen due to feed mill errors.
- Normal salt levels are 0.3-0.4% of the ration.
- If the level reaches 1.5-2% clinical signs will occur.
Sodium Chloride

- The clinical presentation is stunted, wet birds with profuse diarrhea. They tend to huddle together.
Sodium Chloride

- On post mortem examination, vesiculated or cystic testes is a diagnostic lesion.
- Eventually ascites may develop.
Profuse diarrhea
Wet droppings
Ascites
Cystic Testes
FEED ADDITIVES
Copper Sulfate

- This is an astringent used to treat mycotic problems. It is commonly used in broiler feed and occasionally in pullet feed.
Copper Sulfate

- It comes in two forms; powder and flake/granular.
- If the flake (granular) is used, gastrointestinal burns will result especially in the proventriculus and gizzard producing a green color in the gizzard and dark tarry feces.
Stained gizzard
Copper Sulfate

- The level will be toxic if it is over 2 lbs./ton of feed.

- It is commonly used at 1-1.5 lbs/ton. The water soluble form is not as caustic.
3-Nitro

- This is a universal broiler feed ingredient used at 25-33 g/ton for growth and pigment enhancement and has mild coccidiostat activity.

- It is commonly used with Coban.
3-Nitro

• Toxicity to this product is common.

• Most feeds are mixed for 3 minutes which is not enough to prevent "hot spots".
3-Nitro

• Generally, the chickens will present with cervical paralysis, usually on the first cool morning of the season.

• If the birds are left alone and able to drink water, generally, the problem will resolve itself.
3-Nitro

• The mortality is usually low unless the weather becomes hot and the birds can't get to the water to drink.

• Another, milder presentation is the birds will "duck walk" early in the morning.
Cervical paralysis
Duck walking
FEED CONTAMINANTS
Ammonium Nitrate

- This gets into the feed from contaminated freight cars.
- The birds will drink excessively and have severe diarrhea.
- The combs may appear cyanotic.
Arasan

- This is a seed corn treatment to prevent mold growth. It turns the kernels pink.
- Toxicity occurs when seed corn is diverted into feed.
Arasan

- At levels over 10 ppm it prevents calcification of the bone resulting in slowed skeletal development and it causes breeders to lay eggs without shells.

- Chicks that hatch from eggs laid by hens ingesting Arasan have small skulls and so exophthalmos occurs.
Impaired skeletal development
PCB's

- These compounds are used in electrical transformers.
- It has gotten into fish meal through transformer explosions.
PCB's

- It causes decreased growth rates, ascites, cirrhosis of the liver, and increased mortality.

- It can be passed in the eggs of commercial egg layers. The compound is stored in the fat.
New asphalt
Ascites
Histamine

- This is a biogenic amine caused by the breakdown of fish meal and other animal byproducts used in feed.

- It occurs when animal by-products degrade, so it is a problem if poor quality product is used.
Histamine

• These protein sources may be used at 1-5% because they are inexpensive.

• This disease is common in South America where it is called *vomito negro* or black vomit.
Histamine

The compound causes vascular damage in the gastrointestinal tract and causes the birds to bleed to death.
Hemorrhage in crop
Hemorrhage in crop
Rapeseed

- Also known as canola. There is a substance in canola that is supposed to be bred out of the grain, which causes ruptured livers.
ENVIRONMENTAL CONTAMINANTS
Diazinon

- This product is used to control fire ants.
- Use inside the chicken house is not legal.
- The pellets are yellow and will attract the birds.
Diazinon

- It is an organophosphate so toxicity results in diarrhea and lacrimation.
- On postmortem you may find yellow pellets in the crop and gizzard.
- The compound is rapidly metabolized so residues will not be present in the tissues.
Lacrimation
Yellow pellets
Formaldehyde

- Companies used to use formaldehyde crystals in hen nests to control bacterial contamination on egg shells in an effort to improve chick quality.

- These flakes, when exposed to moisture, will produce gas.
Formaldehyde

- But the chickens will eat the flakes which will burn holes in the lining of the gastrointestinal tract.

- On postmortem you may still smell the formaldehyde odor.
Formaldagen burns
Quaternary Ammonia

- This is a commonly used disinfectant.
- Turkeys are particularly sensitive to this product.
- It will cause oral lesions that look like T-2 mycotoxicosis when used in drinking water.
- Levels of 100 ppm will cause weight depression in broilers but will kill turkeys.
Mouth burns
Sulfur

- This product is commonly used to change the pH of the soil which decreases the survival of some pathogens and improves bird performance.
Sulfur

• The sulfur is placed on the floor at a rate of 300 lbs./16,000 sq.ft.

• It should but wetted in order to get it down into the soil.

• Then clean shavings should be applied.
Sulfur

- If the sulfur is left in powder form, the birds can scratch down to it through the litter.

- If the powder gets on the birds and contacts any moisture it will produce sulfuric acid which causes skin burns and blindness.

- Birds may die as a result.
Skin burns and blindness
Skin burns
ANTIMICROBIALS
Sulfonamides

- Toxicity will produce a hemorrhagic syndrome.

- Birds are depressed, pale, and underweight.
Sulfonamides

This condition occurs when sulfas are used to treat disease problems because the therapeutic level in poultry is close to the toxic level.
Sulfonamides

- Sulfonamides are difficult to mix evenly in feed. Both feed and water administration is used.

- Toxicity can occur when no allowances are made for increased consumption to meet metabolic needs or for high environmental temperature.
Sufonamides

- Egg layers have decreased production and shell quality with decrease in brown pigmentation.
- Grossly, hemorrhages in skin, muscle, and internal organs are the most consistent lesion.
- Normal dark-red bone marrow in growing birds changes to pink in mild cases and yellow in severe cases.
- The intestinal tract may be spotted with petechial and ecchymotic hemorrhages.
Gizzard hemorrrages
Muscle hemorrhages
Heart hemorrhages
Intestinal hemorrhages
Pale bone marrow