CASE 15J02459- 5 day Broiler breeder pullet

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History

• 12,000 chicks placed in house

• Day 1  133  dead chicks
• Day 3  1226 dead chicks
• Day 4  4600 dead chicks
• Day 7 Mortality rate was 100%.

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Images from commercial web site
Gross Findings

• Birds were “down” in one of three houses
• Feed in the GI tract,
• Mild dehydrated
• Bones may have been a little weak,
• A few had aspergillosis lesions.
• Some Livers looked suggestive of possible septicemia
• Liver lesions were not consistent and did not seem to explain the mortality.”
5 day Broiler-breeder chick

Liver, H & E

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5 day Broiler-breeder chick
Liver, H & E

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5 day Broiler-breeder chick

Liver, Trichrome

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Toxicology results (gizzard content)

• Chlorpyrifos (organophosphate)
• 0.61 ppm in gizzard content.
• House was sprayed with the organophosphate insecticide Chlorpyrifos
• This time span of spraying prior to placement is considered normal.

Sandra Mann, Chemist

Fruit fly assay

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Brain cholinesterase

- Values 11-16 micromoles/gram/minute (uM/g/min).
- Reference range 18.2 +/- 4.23 uM/g/min.
- > 50% inhibition and often > 80% inhibition)

Dr. Robert H Poppenga, California Animal Health & Food Safety Laboratory System

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Rhodamine staining for Copper, liver

Non-clinically affected chick  Down chick

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5 day Broiler-breeder chick, liver

Non-clinically affected chick

Down chick

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Diagnosis Copper toxicity

- Hepatopathy, intracellular copper, diffuse, moderate, with brown pigment in hepatocytes, liver
- Toxic levels of copper in the liver at 333 ppm-dry weight, Sandra Mann (9-45 ppm-dry reference range (Malinak), Day old chick liver Cu: 6.27 ppm-wet wt. (Zinn Pro)
- Feed level House A-2600 and House B 1500 ppm (Greater than 200 ppm toxic)
- Detection of Chlorpyrifos (0.61 mg/kg detected in gizzard content, 32 mg/kg is a level reported to be toxic, 60 times lower than toxic dose), so likely incidental
Conclusion

• An error was made at feed mill resulting in 10x copper level
• Copper toxicity causes free-radical production and oxidative damage to RBC membrane
• Results in hemolytic anemia
• Water blood (9.5-18% PCV, reference range (30-41%) (Malinak)


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