



Drinker System Management and Sanitation

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Water and poultry

- ▶ Adequate water supply
 - ▶ Birds
 - ▶ Evaporative cooling
- ▶ Water quality
 - ▶ Vaccine efficacy
 - ▶ Equipment performance
 - ▶ Bird performance

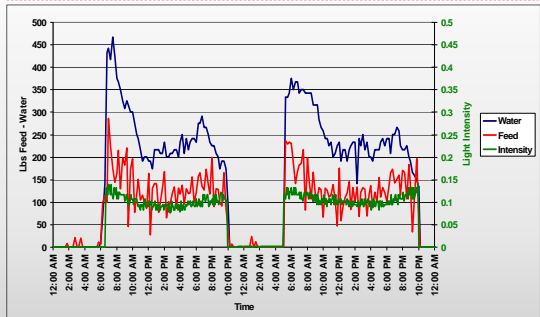




Water (H₂O)

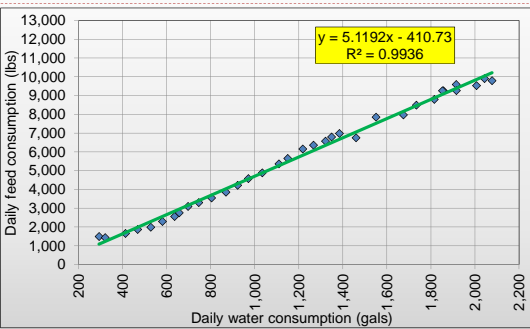

- ▶ Functions of Water
 - ▶ Transportation of Nutrients
 - ▶ Chemical Reactions
 - ▶ Body Temperature Regulation
 - ▶ Lubrication for Joints and Organs
 - ▶ Elimination of Body Wastes
- ▶ Factors Influencing Water Consumption
 - ▶ Environmental Temperature and Management
 - ▶ Disease
 - ▶ Genetics and Nutrition
 - ▶ Bird age
 - ▶ Management
 - ▶ Feed consumption


Water consumption follows feed consumption very closely

Feed can be predicted from water

Water System Design

Water system design

- ▶ Water volume requirement
- ▶ Getting the water to the house
- ▶ Water treatment
- ▶ Water pressure
- ▶ Medicator
- ▶ Water treatment
- ▶ Drinker type
- ▶ Number of lines
- ▶ Number of nipples



Water volume requirement



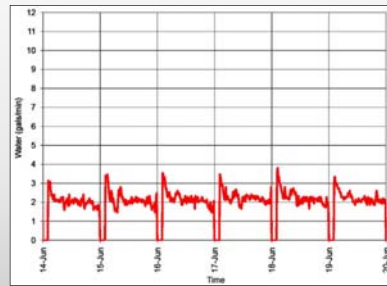
Water Supply

- ▶ Make sure well is adequate (water amount)
- ▶ Proper water line size
 - ▶ Bird numbers
 - ▶ Evaporative cooling system requirements
- ▶ Minimize restrictions
- ▶ Properly sized filters for water volume

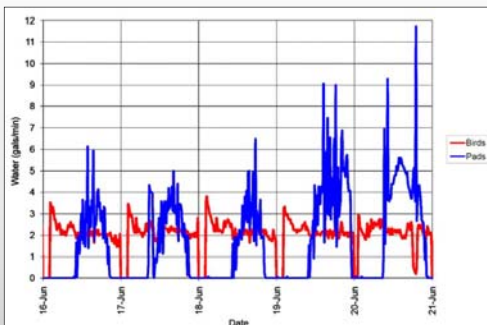


Water Supply

- ▶ Water systems need to meet peak demand

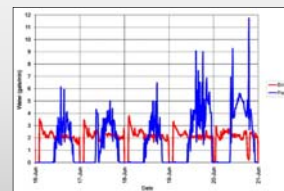


Water Supply




Water requirement/house

- ▶ Bird drinking water 4-5 gal or 15-19 L
- ▶ 6" Evaporative cooling pad system 12 gal or 46 L
- ▶ Total peak requirement on this day **17 gal or 65 L**





Getting water to the house




General Pipe Sizing Guidelines

Flow Rate	Pipe Size
5 gals/min or less (19 L)	¾"
10 gals/min or less (38 L)	1"
20 gals/min or less (76 L)	1½"
40 gals/min or less (151 L)	2"
60 gals/min or less (227 L)	2 ½"
80 gals/min or less (303 L)	3"






Water treatment





Water quality

- ▶ Conduct water test
 - ▶ Mineral
 - ▶ Impurities
 - ▶ Bacteria





Why Treat Water?

- ▶ Bird health/promote growth
- ▶ Prevent drinker failure
 - ▶ Prevent water deprivation
 - ▶ Extend equipment life
 - ▶ Reduce water line leakage
 - ▶ Maintain better litter conditions
- ▶ Reduce laborious tasks
 - ▶ Filter changing and maintenance
 - ▶ Drinker line maintenance

Conduct water test routinely



Soil, Plant, and Water Laboratory
2405 College Station Road
Athens, Georgia 30602-0017
Web site: <http://land.com.uga.edu>


Water Treatment System Analysis Report

Sample ID: 430726 (Name)

Client Information		Lab Information		Geography Information	
Name: Key	4171 John W. Beersingh Blvd Collins, GA 30623	Lab: 430726	Sample Address: Key House 4171 John W. Beersingh Blvd Collins, GA 30623	Collected: Apr 4, 2014	Turnoff Contact: 205 North Main Street Rochester, GA 30679
Sample: J	4171 John W. Beersingh Blvd Collins, GA 30623	Printed: Apr 16, 2014		Phone: 706-535-4724	email: spg@land.com.uga.edu


Results:
pH: 8.1 (Desired pH range 6.5 to 8.5)
Calculated Hardness: 38 ppm (5.7 gr/gal) - Moderately Hard Water
(Water hardness is due to the presence of certain dissolved minerals, primarily calcium and magnesium.)
Saturation Index: 0.2 - Balanced Treatment Not Needed!

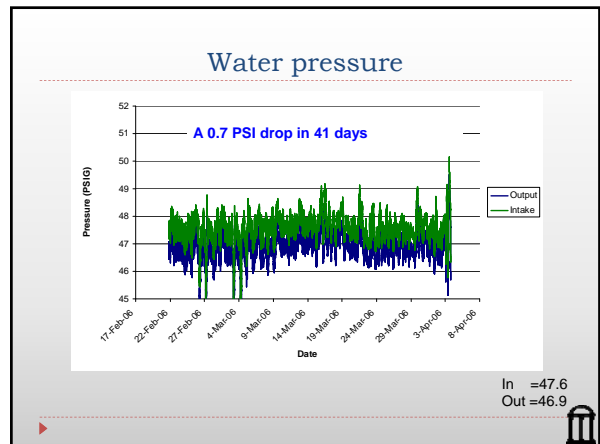
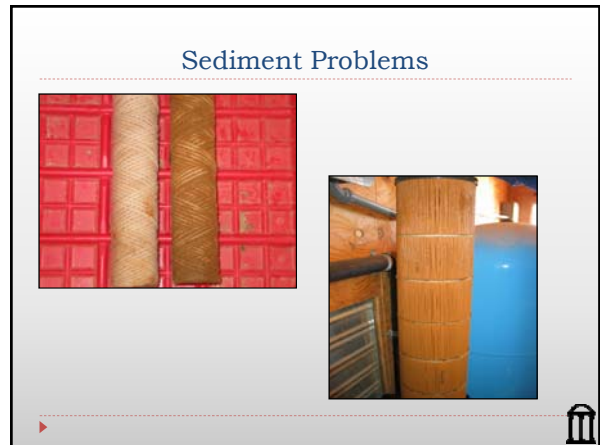
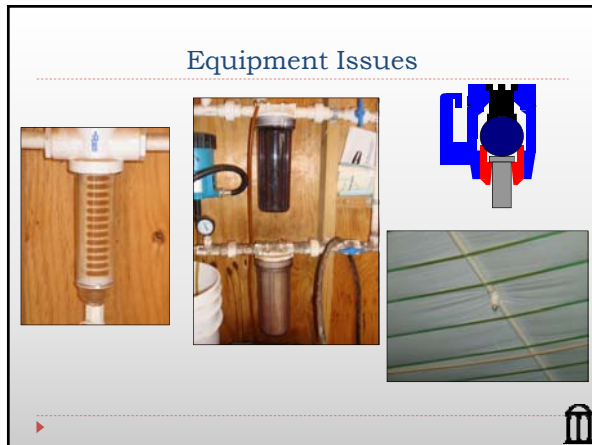
Parameter	Concentration in Sample	EPA Maximum Level*	Parameter	Concentration in Sample	EPA Maximum Level*
Alkalinity	112 ppm		Manganese (Mn)	negligible	0.05 ppm (1)
Aluminum (Al)	negligible	0.2 ppm (5)	Molybdenum (Mo)	negligible	No Set Maximum
Barium (Ba)	0.02 ppm	No Set Maximum	Nickel (Ni)	negligible	No Set Maximum
Calcium (Ca)	28.2 ppm	No Set Maximum	Nitrate-Nitrogen (NO ₃ -N)	negligible	10.0 ppm (P)
Carbon Dioxide (CO ₂)	1.76 ppm		Phosphate (PO ₄)	negligible	
Chloride (Cl)	8.08 ppm	250 ppm (5)	Plumbum (Pb)	negligible	No Set Maximum
Chromium (Cr)	negligible	0.1 ppm (P)	Practically None	2.1 ppm	No Set Maximum
Cyanide (CN) Specific			Residual Chlorine	0.00 ppm	No Set Maximum
Conductance @ 25°C	236 µS/cm				

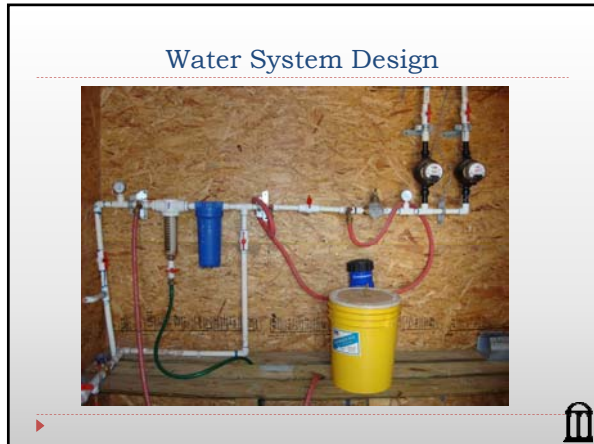


Poultry Drinking Water Quality

Contaminant, Characteristic or Mineral	Maximum Acceptable Levels
Bacteria	
Total Heterotrophic Bacteria	100 CFU/100 ml
Coliform Bacteria	50 CFU/100 ml
pH	6.0-6.8
Hardness	110
Calcium	500 ppm
Chloride	250 ppm
Copper	0.6 ppm
Iron ²⁺	0.03 ppm
Magnesium	125 ppm
Manganese ²⁺	0.05 ppm
Nitrate ^{NO3}	25 ppm
Phosphorus	0.1 ppm
Potassium	500 ppm
Sodium	50 ppm
Sulfate	250 ppm

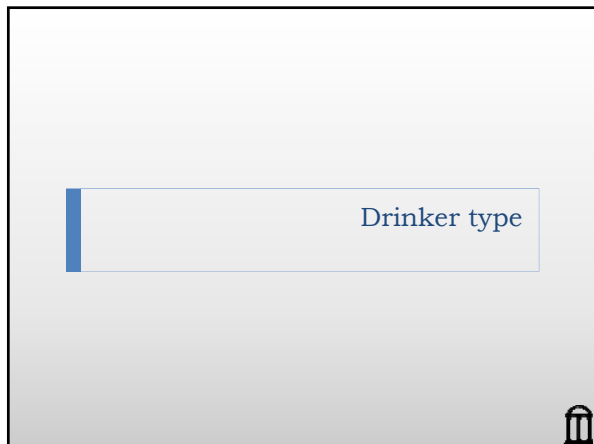
- ### Water Quality Performance issues
- Increased feed conversion
 - Reduced body weights
 - Increased condemnation and mortality
 - Food safety concerns
 - Lessen effectiveness of medication and vaccines
 - Increased equipment maintenance/cost
 - Reduced equipment life
 - Poor egg production
 - High embryonic mortality
 - Poor hatchability
 - Reduced water consumption
- 





Fe and Mn removal

- ▶ Maximum acceptable levels
 - ▶ Fe - 0.3 ppm
 - ▶ Mn - 0.05 ppm
- ▶ Test farm values
 - ▶ Fe - 3.3 ppm
 - ▶ Mn - 0.1 ppm



Enclosed Drinker Systems

Totally Enclosed Drinker System?

Drinker System

- ▶ Provide birds unlimited access to water
 - ▶ Should provide quality water
- ▶ Minimize water leakage
- ▶ Improved feed conversion

Drinker Sanitation and Cleaning

- ▶ Water line Sanitation (Birds present)
 - ▶ Chlorine
 - ▶ Chlorine dioxide
 - ▶ Iodine
 - ▶ Acetic acid, Citric acid, etc..
 - ▶ Ozone
- ▶ Water line Cleaners (Birds not present)
 - ▶ Hydrogen peroxide (silver nitrate)

Drinker System Study

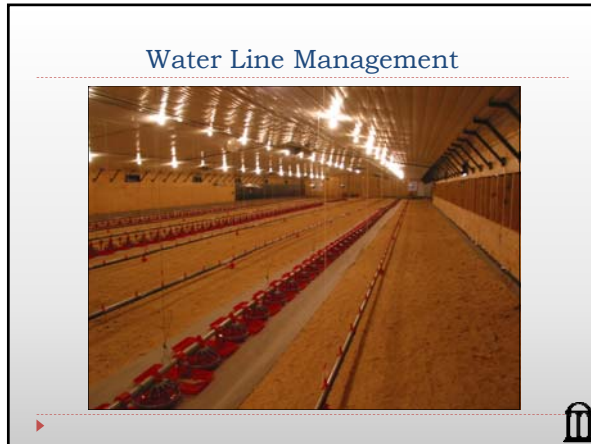
▶ 7 Nipple Drinker Systems Evaluated

- ▶ Chorettime Relia-Flow
- ▶ Cumberland
- ▶ Plasson
- ▶ Roxell SparkCup
- ▶ Roxell SparkNipple
- ▶ Valco
- ▶ Ziggity Max3

No Differences



Cornelison et al., 2005

Water line management

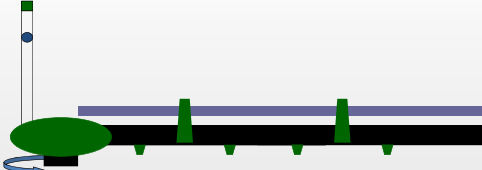


Water Line Management

- ▶ Manage drinker line height
- ▶ Manage drinker line water pressure
- ▶ Flush and sanitize regularly
- ▶ Change filters regularly



In between flocks



- ▶ Reduce water pressure to starting point after birds are removed from the house
- ▶ Prolong the life of the regulator and diaphragm.


Drinker System Tasks

- ▶ Keep drinker lines level

Keep Lines Level

- ▶ Un-level lines lead to air locks
- ▶ Un-level lines provided unequal drinking opportunity for birds
 - ▶ Some birds may not be able to reach drinker
 - ▶ Water pressure will differ down drinker length



Maintain proper line height for bird age

All Drinker Systems have Guides

CHORE-TIME Chick-Lite Nipple Watering Quick Reference Sheet

Management Procedures. BROILERS

Nipple Height Adjustments

- DAY 1:** Set nipple at 1/2 inch above the bird's beak.
- DAY 2:** Move nipple 1/4 inch above the bird's beak.
- DAY 3:** Move nipple 1/2 inch above the bird's beak.
- DAY 3- END:** Move nipple 1/2 inch above the bird's beak.

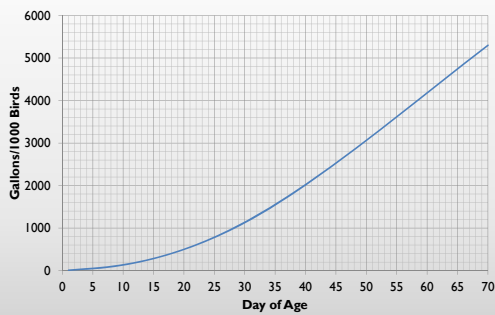
Water Column Pressure

LUBING

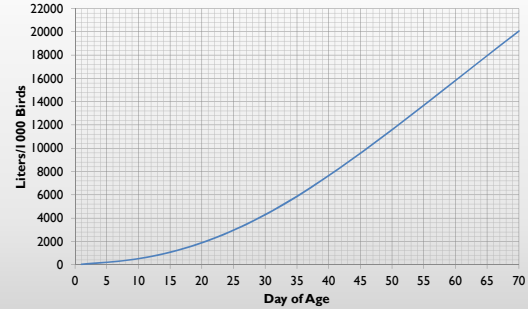
One of the best tools for monitoring bird uniformity



Cumulative Water Consumption (Broilers)



Cumulative Water Consumption (Broilers)

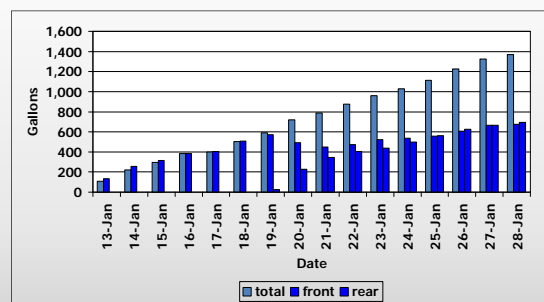


With two water meters

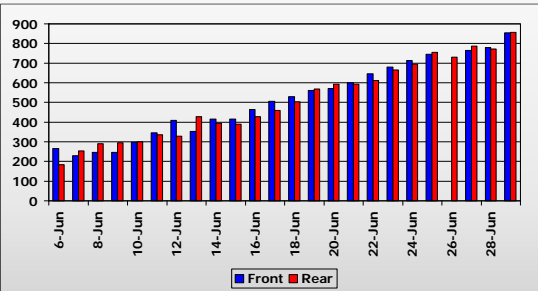
- ▶ You know when they are spread out evenly.
- ▶ You know when to put up fences
- ▶ You know how well your fences are working



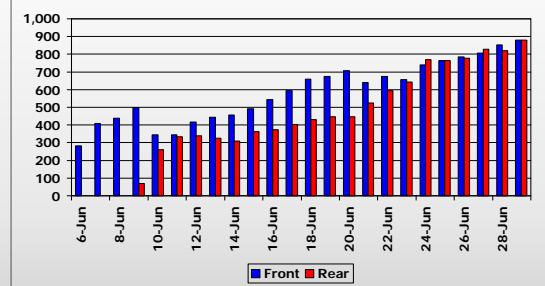
Broiler house water usage



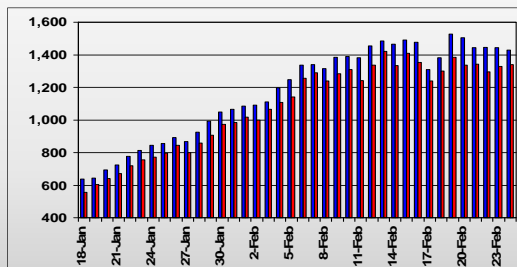
Top producer



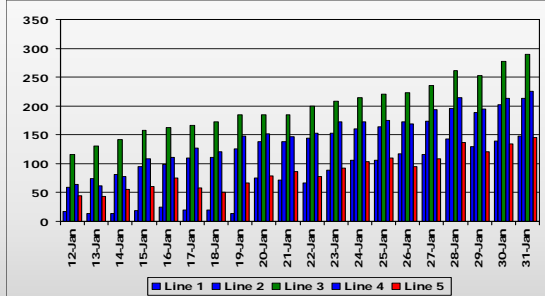
Poor producer



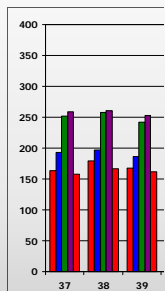
Consistent uneven water consumption



Water consumption (five water lines, three feed lines - 50 ft)



Water consumption



Bird water line height preference



Summary

- ▶ Manage drinkers according to manufacturer's guidelines
- ▶ Monitor bird water consumption daily
- ▶ Perform flushing and cleaning procedures routinely

