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AVIAN Advice

UofA
UNIVERSITY OF ARKANSAS
DIVISION OF AGRICULTURE
COOPERATIVE EXTENSION SERVICE

Arkansas Is Our Campus

Our First Issue

Welcome to our first issue of Avian Advice!

The dictionary defines the word Avian as "of or pertaining to birds" and the word Advice as "an opinion or recommendation offered as a guide to action or conduct." We hope that these definitions help to clarify both the title and our intent.

Articles in *Avian Advice* will focus on current production issues and provide information on recently completed field trials. In addition, each issue will include dates of upcoming meetings, some research trials at the Center of Excellence for Poultry Science and information on who to contact with questions.

Although we hope to provide a wide range of information, we hope to keep *Avian Advice* usable and practical while maintaining a focus on production issues. We hope to make the articles useful for the long haul so we have printed *Avian Advice* with three-hole punches, which will allow you to keep issues in a notebook.

Please let us know what you think (both positive and negative) about *Avian Advice*.

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The Naming of a Newsletter

How did we ever come up with a name like Avian Advice?

We in Extension Poultry Science decided to produce a newsletter aimed at production issues some time ago, but could never agree on a name. Then we hit upon an the idea of a name the newsletter contest for 4-H members.

To make the contest interesting, we offered $100 in prize money and to print the winner's picture in the first issue. We received a total of 118 names entered in the contest from 54 contestants. Obviously, we needed to narrow the list down so that we could finally decide on one name.

Each newsletter name was listed and Extension Poultry Specialists rated each name submitted on a scale from 1 to 5. After the initial rating, several names were tied so an additional rating was done in the same fashion. The vote was very close.

Laine Short of White County submitted the name Avian Advice and, as promised, she received the prize money and her picture in the first issue. We thank Laine and all the other 4-H members who submitted newsletter names.

Name the Newsletter winner, Laine Short of White County, receives her prize money from Extension section leader Frank Jones.

. . . helping ensure the efficient production of top quality poultry products in Arkansas and beyond.

Excellence

S.E. Watkins, J.B. Payne and A.L. Waldroup
Center of Excellence for Poultry Science • University of Arkansas

The Bio-Burner: A New Tool in Poultry Sanitation[1]

Poultry house sanitation plays a crucial role in the control and prevention of harmful diseases. Unfortunately, poor sanitation procedures can actually do more harm than good by creating an environment that allows bacteria to grow and thrive. Most chemical disinfectants have a limited effectiveness in killing organisms when organic matter such as litter, manure and soil are present. Even a thin layer of organic material can provide a protected environment for bacterial spores, viruses, worm eggs and fungi. In addition, moist organic matter may actually provide a food source for bacteria.

The concept of using heat to kill bacteria and other organisms is not new. In the late 1800s, Louis Pasteur actually recommended that surgeons flame their hands to prevent contaminating patients. Heat can be very effective in killing bacteria and other harmful organisms mainly because organisms can not acquire resistance to heat. In addition, heat requires no special conditions to be effective and it leaves behind no residues. Through the years, the poultry industry has courted the concept of using an open flame to burn the floor or heating the barn to elevated temperatures in attempts to control many bacterial and viral diseases. In South America, particularly Peru, a flame torch is often used to burn the litter surface even with birds present in the house.

The bio-burner originated as an attempt to "burn out" corona virus in the floors of turkey barns. In the last year, the concept has been modified until the current bio-burner evolved. The bio burner is an insulated, stainless steel cabinet measuring 4 x 7 x 2 feet. Six liquid propane torches supply a direct flame creating a temperature of greater than 1900º F within the cabinet. Surface temperature during burning has been measured in excess of 900º F. Exposure time is approximately 12 seconds. Surface temperature immediately post burning is about 700º F but drops to around 125º F within 60 seconds. (Figures 1 and 2.)

Several evaluations have been conducted to determine if the bio-burner is an effective tool in reducing and/or eliminating bacteria from the floor or litter surface in broiler and turkey houses. The first evaluation was conducted in a turkey brood house which had been cleaned of litter, washed and disinfected. Sterile drag swabs were dragged in a zigzag pattern down each half of the house. The drag swabs are used to pick up bacteria which might be present. Barns were swabbed pre and post burning. The swabs were then used to determine how much *E. coli*, coliform, *Salmonella* and aerobic (oxygen requiring) bacteria might be present before and after floor burning. It is important to note that these bacteria may or may not be harmful to the birds, but their presence or absence gives an indication of how well the poultry barn was cleaned and disinfected. It was found that bacteria were still present on the floor surface after washing and disinfecting and that burning the floor resulted in a 99 % reduction in all the bacteria measured as compared to the levels seen before the floor was burned. (Table 1.)

A second evaluation was conducted in two turkey brood houses which had been cleaned of litter and thoroughly washed and disinfected. Standing water was present in areas of the barns. Again, drag swabs were used to sample the floor of the barn both pre

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[1]*Poultry Health & Production Seminar*
U.S. Poultry & Egg Association
Memphis, Tennessee
September 15, 1999

and post floor burning. In addition, the floors were sampled again 12 hours post floor burning. The aerobic bacteria count was reduced from over 1,000,000 colony forming units (CFU)/sponge to 234,423 CFU/sponge immediately post burning and were holding fairly steady at 275,423 CFU/sponge 12 hours post floor burning. This indicated that additional killing of bacteria does not appear to be occurring after burning. *E. coli* count was reduced from 69 CFU/sponge pre floor burning down to 17 CFU/sponge post and 21 CFU/sponge 12 hours post burning. Coliforms were reduced from 481 CFU/sponge to 34 post and 75 12 hours post floor burning. (Table 2). *Salmonella* was still detectable in the barn after burning. These results indicate that if too much water is used during the clean out procedure so that standing water remains in the barn, then even burning the floor will not eliminate bacteria that may be present. This is an excellent example of how improper sanitation may actually provide bacteria with an opportunity to not only remain in the barn but also thrive.

The effect of the burner on selected litter surface bacteria was evaluated on a broiler farm. Built up litter which had been decaked was surface burned in four broiler houses. Four additional houses on the farm were decaked and the litter not burned. Drag swabs were used to measure pre and post burn levels of aerobic bacteria, *E. coli*, coliform and *Salmonella*. Shallow litter samples were evaluated for moisture and pH levels. Aerobic bacteria were reduced in the houses from 1,105,885 to 419,015 CFU/sponge. (Table 3.) *E. coli* and coliform levels were almost nonexistent pre and post burn with a count of 4 CFU/sponge pre burn and 0 post burn. Litter moisture dropped from 20.89 % to 17.23 % and litter pH was unaffected (7.17 versus 7.16). Only two samples tested positive for *Salmonella* pre burn and all samples tested negative for *Salmonella* post burn. Birds from the houses with the burned litter weighed more and had similar feed conversions as compared to birds grown in the houses which did not have the litter burned. (Table 4.) Livability for the control house birds averaged 97.04% and the test house birds averaged a 94.17% livability. This lower livability reflected a high first week mortality for one of the four test barns. All barns experienced an outbreak of the coccidiosis (*Eimeria tenella*)as did other farms in the complex during the test period.

A poultry house which had experienced a gangrenous dermatitis outbreak was used as a

(continued on page 4)

Figure 1. *The floor temperature was monitored immediately post burning every 10 feet to determine if the bio-burner had a consistent effect on the floor surface temperature.*

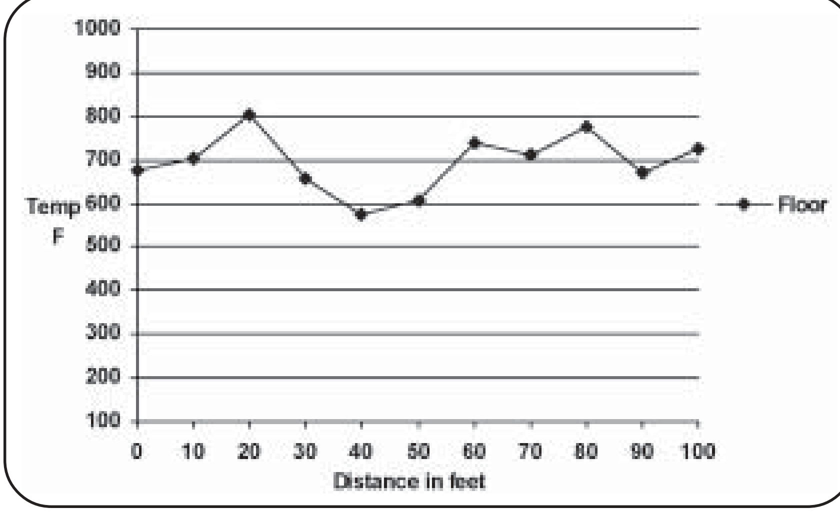


Figure 2. *Effect of the Bio-burner on soil temperature over time.*

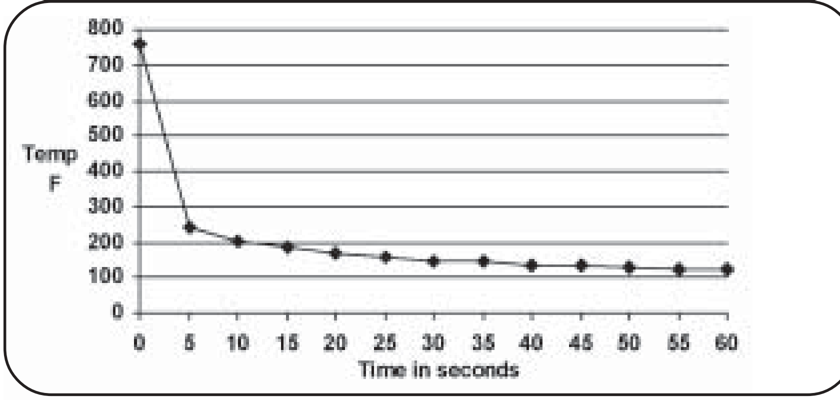


Table 1. Effect of floor burning on E. coli and Coliform levels in a turkey brood house floor

Sample Time	E. coli (CFU/Sponge)	Coliform (CFU/Sponge)	Aerobic Bacteria (CFU/Sponge)	Salmonella (Incidence) Positives	Total
PRE BURN	220	210	3,096,706	2	4
POST BURN	0	0	24,592	0	4

test site for the bio-burner. Since the bacteria *Clostridium* has been identified as a potential culprit in gangrenous dermatitis outbreaks, this bacteria was measured on the floor. A second farm which had experienced a botulism outbreak (also caused by *Clostridium*) served as another test site for the bio-burner. Again drag swabs were used both pre and post burning the cleaned dirt floors. A 93.6% reduction in *Clostridium* counts was found in the dermatitis house when post floor burning counts were compared to pre floor burning counts. *Clostridium* levels in the houses which had experienced botulism were determined to be almost 1,000,000 CFU/sponge and dropped to an average of 755 CFU/sponge post burning. (Table 5.) Flocks reared after the floors had been burned did not experience dermatitis or botulism problems.

A farm which had experienced an *E. coli* outbreak beginning the first week of the flock's life was used to determine the effect of the bio-burner on controlling disease pathogens without completely cleaning the barn. Prior to the sick flock, the house had been thoroughly cleaned and new rice hulls had been placed in the two barns. Again sterile drag swabs were used to compare selected bacterial populations pre and post litter surface burning. Aerobic bacteria, *E. coli*, coliform, yeast and mold levels were measure. Aerobic bacteria, *E. coli*, coliform, yeast and mold levels were reduced after litter surface burning. (Table 6.)

In conclusion, evaluations have been conducted with the bio-burner, an apparatus which exposes poultry houses floor surfaces to a direct and intense flame for a few seconds. Initial evaluations indicate the bio-burner has potential as an aid in reducing microbial populations in the floor and litter surface and appears to show promise in the elimination or reduction of disease problems in the floor surface of poultry facilities. However, the bio-burner cannot replace good management and sanitation. ■

Table 2. Effect of floor burning on bacteria levels in turkey houses which have been cleaned and sanitized

Sample Time	E. coli (CFU/Sponge)	Coliform (CFU/Sponge)	Aerobic Bacteria (CFU/Sponge)	Salmonella (Incidence) Positives	Total
PRE BURN	69	481	1,047,129	3	6
POST BURN	17	44	234,423	2	6
12 HOURS POST BURN	21	75	275,423	4	4

Table 3. Effect of burning the litter surface in broiler houses on bacteria levels

Sample Time	E. coli (CFU/Sponge)	Total Aerobic Bacteria (CFU/Sponge)	Salmonella (Incidence) Positives	Total
PRE BURN	4	1,105,885	2	8
POST BURN	1	416,015	0	8

Table 4. Flock performance for birds which were reared on litter that had been surface burned with the bio-burner

House Treatment	Average Bird Weights (lbs)	Feed-to-Gain Ratios (lb:lb)	Livability (%)
Burn Houses	6.04	2.16	94.17
No Burn Houses	5.84	2.17	97.04

Table 5. Effect of floor burning on Clostridium levels in broiler houses which had experienced Dermatitis and Botulism

Sample Time	FARM ONE (Dermatitis) *Clostridium* (CFU/Sponge)	FARM TWO (Botulism) *Clostridium* (CFU/Sponge)
PRE BURN	1,883	822,422
POST BURN	121	755

Table 6. Effect of litter surface burning on the microbial populations in a broiler facility that had experienced an E. coli outbreak

Sample Time	E. coli (CFU/Sponge)	Coliform (CFU/Sponge)	Aerobic Bacteria (CFU/Sponge)	Molds (CFU/Sponge)	Yeast (CFU/Sponge)
PRE BURN	83	38	2,244,399	750	5,572
POST BURN	8	1	634,892	273	334

Frank T. Jones • Extension Poultry Specialist
Center of Excellence for Poultry Science • University of Arkansas

Water - Do Your Birds Have Enough?

Water makes up about 70% of a bird's body. It is used within the bird's body to transport nutrients to cells, lubricate joints, excrete waste materials and keep the bird cool through panting. The delivery of an adequate amount of water to birds is one of the most important single factors affecting performance of a flock. Yet, too often it is simply assumed that water is delivered because the pipe is at the right height and drinkers are present.

The University of Arkansas Broiler Unit at Savoy near Fayetteville has been in operation for about nine years. The farm contains four 40 x 400 ft broiler houses in which broilers are grown under contract with a local integrator. There have been a total of 49 flocks grown since the Unit began. Twenty-nine (29) flocks were heavy birds (7-8 weeks old), while the remaining 20 flocks were lighter birds (5-6 weeks old). When the production records were examined it was noticed that when light birds were grown the Unit consistently ranked in the top 5 when compared with other growers. However, when the Unit produced heavier birds, results were never as consistent.

Water consumption per day was determined and averaged for the 4 houses on the Unit. Figure 1 shows a plot of this information. Water consumption per day steadily increased from placement to day 42 (6 weeks of age), but after 6 weeks of age water consumption increased very little. Water consumption information was then determined for each house. This information is shown in Figure 2. Water consumption was very similar among the houses until 5 weeks of age. At 6 and 7 weeks of age houses 1 and 3 consumed more water than did houses 2 and 4. Since all the houses contained identical sized water lines, an examination of water flow through the nipples was conducted.

Water flow through nipples was measured using a calibrated measuring cup called a graduate cylinder. The pin on each nipple was pushed to the very top and the water that flowed through the nipple in 1 minute was measured. This procedure was designed to be certain that the maximum water flow was collected through each nipple. Nipples were chosen randomly, but were spaced evenly between the standpipe end to the inlet end of the water line. The information on nipple water flow is shown in Table 1.

(continued on page 6)

How to Test Nipple Water Flow

1. Obtain a kitchen measuring cup. Measuring cups can be purchased for under $1.
2. Obtain paper and a pencil or pen for recording results and a watch to time flows.
3. Select at least 10 (preferably 20) nipples per water line. Be certain that approximately the same number of nipples is chosen from the inlet, middle and standpipe end of the line.
4. Hold the measuring cup under the nipple with one hand and activate the pin with the other hand. Press the pin so as to ensure that a maximum amount of water flows from each nipple, which usually means the pin is pushed to the very top.
5. Use the watch to time the water flow and collect water for 1 minute.
6. Observe and record the amount of wate collected.
7. Average water flows from each line.
8. Average water flows for heavy birds should average at least 2oz./min.

Figure 1. **Daily Water Consumption of Broilers at the UA Broiler Unit**

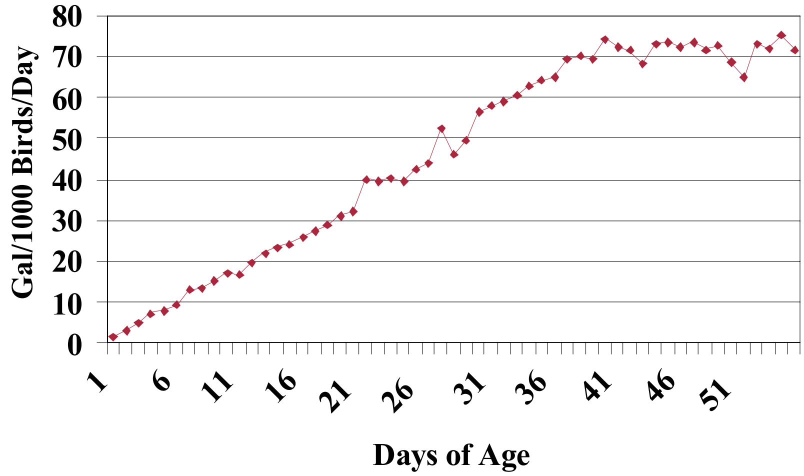


Figure 2. **Daily Water Consumption by House at the UA Broiler Unit**

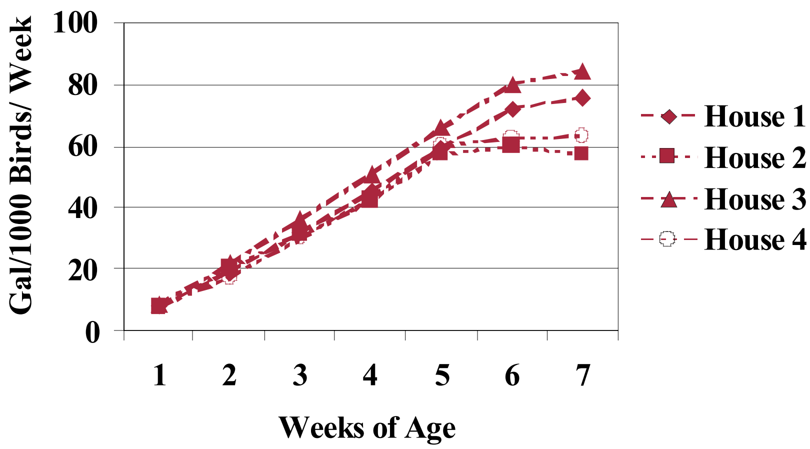


Table 1. **Water Flow Through Nipples at the U of A Broiler Unit**

Maximum Water Flow Rates From Nipple Waterers (in ml/min)				
Observation / Item	House 1	House 2	House 3	House 4
	In ml/min			
1	64	44	70	29
2	52	50	70	28
3	60	48	76	28
4	62	42	62	28
5	60	44	60	30
6	64	48	61	24
7	54	44	64	26
8	56	40	66	26
9	68	40	68	28
10	60	46	64	30
11	62	42	68	38
12	64	42	64	28
13	70	50	66	28
14	64	40	64	30
15	60	52	62	40
16	62	50	68	36
17	66	58	62	36
18	74	48	70	36
19	58	58	70	30
20	74	52	70	46
Mean (ml/min)	62.7	46.9	66.25	31.25
Fl. Oz/min	2.11	1.58	2.23	1.06

Note: 1 fl. oz = 29.6 ml

Several things are apparent from the information in Table 1. On average, less water flowed through nipples in houses 2 and 4 than those in houses 1 and 3. This lower water flow may explain why birds in houses 2 and 4 consumed less water than birds in houses 1 and 3 (Figure 2). Even though the nipples were all the same brand and model, there was a good deal of variation in the water flow from each nipple. For instance, the flow rate in house 1 ranged from 52 to 74 ml/minute. This variability in flow rate means that when determining average nipple water flow a minimum of 10 (preferably 20) nipples should be tested. Water flow was less in the first nipples tested (nipples 1-10) than in the last nipples tested (nipples 11-20). This suggests that the position of the nipple in the line will tend to affect water flow. In order to get an accurate average water flow nipples must be tested at the beginning, middle and end of the line. However, how much difference does the levelness of the line make in water flow?

Nipples in one line within house 1 were used to test the effect of levelness on nipple water flow. The average water flow from 10 nipples was determined at the inlet. Then the average flow rates from 10 nipples in the middle and ten at the standpipe end of the same waterline were determined. When the line was level, average flow was greatest at the inlet end and least at the standpipe end (see Figure 3). When the inlet end of the line was raised by 15 to 20° from level, water flow was greatest in nipples in the middle of the line and least at the end of the line (see Figure 4). However, average water flow from all nipples was greater with the inlet end elevated rather than with the line level. Raising the middle of the line by 15 to 20°

from level resulted in the greatest average flow at the inlet end and the least flow in the middle (see Figure 5). The effect of raising the standpipe end of the line was not tested, but it was assumed from the results in Figure 5 that raising the standpipe end of the line would result in highest water flow at the inlet end and lowest flow at the standpipe. This information suggests that water lines should be raised slightly at the inlet end rather than level. However, it should be noted that levelness of the line affected water flow by about 10%. In contrast, the use of a nipple with a low water flow rate can mean that birds receive 50% less water than birds on nipples with higher flow rates (see Table 1).

Following this investigation, nipples in houses 2 and 4 were changed to nipples with flow rates similar to those in house 3 (see Table 1). Two flocks of heavy birds were grown on the new nipples and the performance results from these flocks were compared with the performance of flocks grown approximately the same time the previous year. The results of this comparison are shown in Table 2. After the installation of the new nipples, feed conversion improved, livability increased, weight gain improved, projected weight at 50 days was heavier, cost/lb decreased and pay/lb increased.

In conclusion, it is essential that broilers have adequate water. To insure that birds are receiving adequate water by testing nipples periodically. ■

Table 2. Performance Before and After Water Nipple Change[1]

Item	Before[2]	After[3]
Feed Conversion	2.028	1.930
Livability	94.41	95.87
Wt gain/day[4]	.1102	.1114
Proj Wt @ 50 da[5]	5.51	5.57
Cost/lb	13.5	12.95
Pay/lb	4.124	4.203

[1] Average of Houses 2 and 4
[2] Average of Flocks 41 & 42
[3] Average of Flocks 45 & 46
[4] Body wt/days of age
[5] Wt gain/day * 50

Figure 3. Average Nipple Water Flow in House 1 of the UA Broiler Unit - Line Level

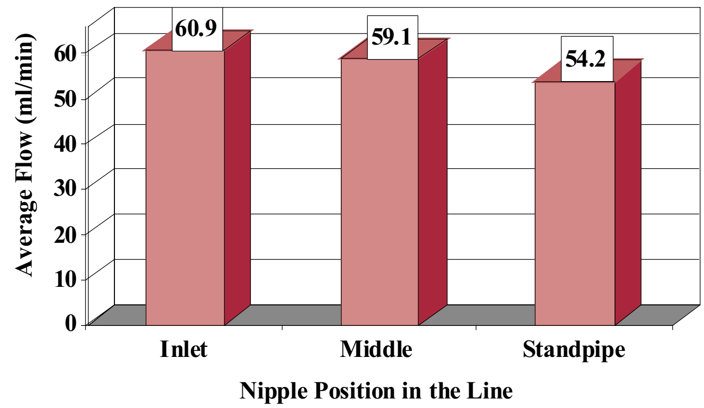


Figure 4. Average Nipple Water Flow in House 1 of the UA Broiler Unit - Inlet Up

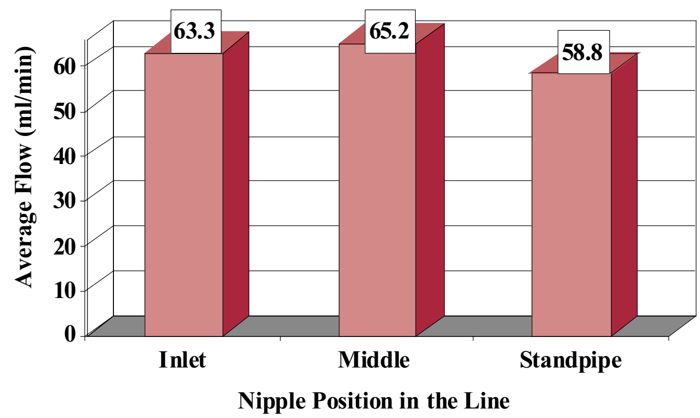
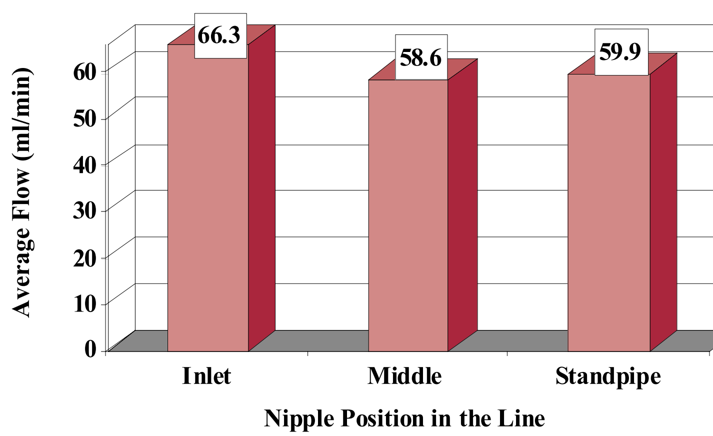


Figure 5. Average Nipple Water Flow in House 1 of the UA Broiler Unit - Middle Up



F.D. Clark • Extension Poultry Health Veterinarian
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Poultry Biosecurity

Diseases cost the poultry industry an estimated 10% of the total bird value each year. In Arkansas this means that diseases may cost the industry as much as $230 million per year. These losses include direct losses from mortality, decreases in egg production and indirect costs from poor performance, increased medication costs, downgrades at the plant, increased condemnation rates and other similar costs. Severe disease outbreaks such as the 1983-84 avian influenza outbreak in Pennsylvania resulted in the eradication of over 17 million birds and direct costs of almost $65 million as well as countless millions in indirect costs. Prevention programs provide some protection against losses such as these. A good disease prevention program will incorporate disinfection and sanitation procedures, vaccination practices, and A Biosecurity to reduce the exposure of birds to diseases.

bio-, meaning "life," "living organism"

se•cu•ri•ty, n.,1. freedom from danger, risk, etc.; safety

Biosecurity is a term that is frequently used when discussing disease control in poultry. The word itself is a combination of two terms, "bio" and "security". The term bio is from the Greek word bios and means life. The definition of "security" is safety or freedom from risk or danger. When combined together as the word biosecurity translates as life free of risk or in other words safety for the living. In regard to poultry; the word means any procedure or practice which will prevent or limit the exposure of a flock to disease causing organisms. Biosecurity involves many "common sense" procedures which are often overlooked or only carelessly or sporadically followed. Good biosecurity programs need to address two broad areas: the physical farm and the farm managerial routines.

The physical poultry farm itself is aimed at preventing the entrance of disease organisms into poultry facilities. Changes to physical facilities are often the most difficult or costly to change. Ideally, the poultry farm should be constructed as isolated from other animal facilities as is possible. A rule of thumb has been to locate farms 1-3 miles from any other poultry facility. The facilities should be constructed so that wild birds and vermin can be effectively excluded and they should be kept in good repair. In addition, facilities should be constructed so that maintenance can be easily and efficiently done. Farm buildings should be located as far away as possible from main roadways since vehicles (including live haul trucks) can spread disease between flocks. Automobile traffic on the farm should not be allowed to park near house entrances so that the chance of transmission of disease organisms on vehicles to birds is minimized.

The second component of biosecurity programs (farm managerial routines) is directed at controlling the sources of disease. Farm routines are the easiest, quickest, and least costly to change and can have the greatest impact on disease prevention. Farm routines can either assist in the spread or diseases or prevent the disease spread. Thus, it is important to understand how farm routines can cause the transmission of disease organisms from disease sources to flocks. Diseases in poultry flocks come from the following five sources:

1. Diseased or Carrier Poultry
2. Vermin (rodents, wildlife, free flying birds, insects)
3. Personnel (clothing and shoes of on-farm caretakers and visitors)
4. Inanimate objects contaminated with disease organisms
5. Contaminated air and water.

ROUTINES FOR DEALING WITH DISEASED OR CARRIER POULTRY

Carrier birds are those birds that have the disease organism, but do not show the disease. It is impossible to detect carrier birds without testing and often the disease has already spread once these birds have been detected.

Thus, it is generally best to avoid contact with all other birds to minimize disease risk. It is also important to have no other avian (bird) species on the poultry farm since these birds can carry diseases. The utilization of all in / all out facilities can greatly reduce the risk of disease transmission since potentially infected birds are removed from the premises before new birds are acquired. In addition, all in/ all out facilities allow a period of time between flocks to clean and disinfect. All replacement poultry should be from disease free stock. Caretakers should learn to recognize symptoms of disease so that assistance can be contacted as soon as possible to prevent disease spread to other poultry on the farm. Dead birds should be quickly removed from poultry houses to prevent disease spread via cannibalism. Dead birds should be disposed off by approved methods such as incineration, composting, or rendering. Since dead birds can carry disease, it is important not to bring dead birds from other farms on to your own farm. In addition, since litter can also carry disease organisms, it is important to keep litter from other farms off you own farm.

ROUTINES FOR PREVENTION OF DISEASE VIA VERMIN

All poultry houses should be constructed with wire small enough to prevent wild birds and animals from entering the house. They should be checked and repaired as needed. Since rodents contaminate and consume feed and water, spread many diseases, and destroy and/or damage equipment all poultry buildings should be rodent proofed. In addition, the area around a poultry house and farm should be cleaned to prevent rodent infestation and all spilled feed should be cleared away as soon as possible. A baiting program should also be implemented on the poultry farm to keep rodent populations low. Litter and manure beetles can act as disease reservoirs and also damage poultry house insulation and wooden structures. Flies can also spread disease and can be a nuisance on the farm or to neighbors. Approved pesticide application programs will help reduce the number of beetles and flies. In addition, maintaining litter in dry condition and repair or water leaks in and around the house is also helpful.

PREVENTION OF DISEASE FROM PERSONNEL

Access to the poultry farm should be restricted to allow only necessary authorized personnel. It is important to not only restrict visitors but on-farm caretakers should also be cognizant of the possibility of disease spread via daily on farm movement. A traffic flow pattern should be established so that the youngest birds are checked first. Clean clothing (coveralls) and boots should be provided for all personnel entering the poultry farm. If possible a log should be maintained so that personnel, vehicle, and equipment can be tracked as to when, who, and why the farm was visited. A footbath containing a disinfectant may help reduce tracking of organisms via footwear. It is important to remember to change out the disinfectant footbath when it becomes dirty and in accordance with label directions. Also remember that cleaning of rubber boots and/or other footwear before disinfecting is advisable since most disinfectants will be rendered useless by large amounts of organic matter such as litter or fecal material.

PREVENTION OF DISEASE FROM INANIMATE OBJECTS

Inanimate objects such as equipment should be thoroughly washed and disinfected after use. Do not borrow equipment from other farms for use on your farm. All feed and water systems should be cleaned and disinfected on a regular schedule. Do not bring home and use anything from another poultry farm or area where other avian species are kept without cleaning and disinfecting it first or better yet do not bring on the farm under any circumstance.

DISEASE PREVENTION FROM CONTAMINATED WATER AND AIR

It is important to not use water that is possibly contaminated. Chlorination of water and cleaning of water systems will assist in the prevention of disease. Do not water poultry from outside sources such as a pond without proper disinfection of the water. Air borne pathogens are more difficult to prevent since poultry do need ventilation to reduce humidity, ammonia, dust, and heat. Location of the house as far as possible from other poultry farms does assist in prevention of airborne disease.

Biosecurity is one of the most important tools to use in the prevention of disease. A biosecurity program should be an integral part of poultry farm disease prevention practices and should be flexible to allow changes as needed. Constant vigilance and common sense can pay big dividends in the reduction of mortality and condemnations from disease. Prevention of disease is always less costly than treatment, control, and/or salvage. ■

Diseases in poultry flocks come from the following five sources

- *Diseased or Carrier Poultry*
- *Vermin (rodents, wildlife, free flying birds, insects)*
- *Personnel (clothing and shoes of on-farm caretakers and visitors)*
- *Inanimate objects contaminated with disease organisms*
- *Contaminated air and water*

Comments from Tom Tabler • Savoy Broiler Unit Manager
Center of Excellence for Poultry Science • University of Arkansas

Savoy Broiler Unit Performance Report

The performance report will be a regular feature of the newsletter. The report will provide performance data from the unit as well as comments from the Broiler Unit Manager, Mr. Tom Tabler.

Information Key

Variable	Units	Explanation
HSE	No.	House number
FEED CONV	LB/LB	Feed conversion or pounds of feed per pound of gain
HEAD PLACED	No.	Number of chicks place in the house at the beginning of grow-out.
HEAD SOLD	No.	Number of birds sent to the processing plant
LIV	%	Livability or Head sold/Head placed * 100
AGE	D	Age of birds at processing in days
AVE BIRD WT	LBS	Average live bird weight at processing
COND	%	Percentage of birds condemned by the government inspector at the plant. Condemned birds are not fit for human consumption.
FEED COST	$	Feed costs in dollars
CHICK COST	$	Chick costs in dollars
MED COST	$	Medication Costs in dollars
TOTAL COST	$	Total costs in dollars
COST/LB	Cent	Total costs per pound of live bird weight in cents per pount
PAY/LB	Cent	Payment received from the poultry company in cents per pound.
F.A.	$	Fuel allowance-a payment provided by the poultry company to help defray heating fuel costs
GAS USAGE	GAL	Propane usage in gallons
ELECT	KWH	Electrical usage in kilowatt hours

UNIT DESCRIPTION

The first flock at the Savoy Broiler Unit was placed on November 19, 1990. The unit contains four 40 x 400 foot broiler houses. Each house contains Cumberland pan feeders, Ziggity nipple waterers and about 1.5 million BTU propane heating capacity for brooding. Each house is equipped with a computer controller which controls fans, brooders and curtains for temperature control. Houses are also equipped with temperature monitoring equipment (about 80 sensors per house), an electronic water flow monitoring system, weigh bins for feed delivery to the house, sensors for the monitoring of fan run time and devices to determine gas flow from storage tanks.

Houses 1 and 2 were built with steel trusses with R10 insulation in the ceiling while houses 3 and 4 were constructed with wood trusses, R19 ceiling insulation and drop ceilings. Houses 1 and 3 are conventionally ventilated with misters for summer cooling, but 2 and 4 are tunnel ventilated. House 2 contains a “sprinker” cooling system for summer cooling. The system was developed at the University of Arkansas and uses a landscape sprinkler system to deliver a coarse, cooling mist to the backs of the birds. House 4 uses evaporative cooling pads to cool the inlet air.

PRODUCTION SUMMARY: FLOCK 47 (January 8, 1999 - March 1, 1999)

HSE (No)	FEED CONV (LB/LB)	HEAD PLACED (No)	SOLD (No)	HEAD LIV (%)	AGE (D)	WT (LB)	AVE BIRD COND (%).	COST ($)	FEED COST ($)	CHICK COST ($)	MED. COST ($)	TOTAL COST/LB (Cent)	PAY/LB (Cent)	F.A.[1] ($)	GAS USAGE (GAL)	ELECT USAGE (KWH)
1	2.06	19439	17869	91.92	52	5.47	2.60[2]	10071	3305	16.55	13393	14.057	3.6448	375.29	1440	2364
2	2.17	19291	17288	89.62	52	5.56	2.60	10416	3279	16.55	13712	14.639	3.0627	375.29	1100	2409
3	2.11	19295	17516	90.78	52	5.51	2.60	10165	3280	16.55	13461	14.332	3.3696	375.29	264[3]	3753
4	2.12	19226	17929	93.25	52	5.22	2.60	9893	3268	16.55	13178	14.463	3.2389	375.29	1638	2388
FARM	2.11	77251	70602	91.39	52.00	5.44	2.60	40545	13133	66.20	53744	14.371	3.3310	1501.16	4442	10914

[1] F.A. - Fuel Allowance [2] Condemnation percentage could not be divided by house
[3] Lower gas usage and increased electrical usage in House #3 is a reflection of wood pellet furnace installed on this flock.

Manager's Comments on Flock 47

A wood pellet burning furnace was installed in House 3 to begin this flock. The furnace was outside at the middle of the house and heated air is blown into the house and picked up by the 2 axial fans and blown each direction down plastic jet tubes which distribute the heated air the length of the house. Data collection from this project will allow cost comparisons between this system and the conventional propane fired brooder and furnace system. Caked litter removal from houses after the flock sold was as follows: House 1 - 1 load, House 2 - 5 loads, House 3 - 2 loads and House 4 - 1 load. For Flock 47, House 1 had the best feed conversion, while House 2 had the heaviest chicken.

PRODUCTION SUMMARY: FLOCK 48 (March 22, 1999 - May 13 (1,2,3) and May 14 (4), 1999)

HSE (No)	FEED CONV (LB/LB)	HEAD PLACED (No)	SOLD (No)	HEAD LIV (%)	AGE (D)	WT (LB)	AVE BIRD COND (%).	COST ($)	FEED COST ($)	CHICK COST ($)	MED. COST ($)	TOTAL COST/LB (Cent)	PAY/LB (Cent)	F.A.[1] ($)	GAS USAGE (GAL)	ELECT USAGE (KWH)
1	1.94	18893	17792	94.17	51	5.99	2.04[2]	10334	3212	25.95	13572	13.003	4.5222	0.00	955	1997
2	2.08	18827	17457	92.72	51	5.79	2.04	10502	3201	25.95	13729	13.874	3.6504	0.00	580	1546
3	2.02	18893	16923	89.57	51	5.57	2.04	9505	3212	25.95	12743	13.802	3.7233	0.00	467[3]	2601
4	2.12	8893	17744	93.92	52	5.70	2.04	10699	3212	25.95	13937	14.068	3.4567	0.00	838	1516
FARM	2.04	75506	69916	92.60	51.25	5.76	2.04	41041	12836	103.80	53981	13.675	3.8493	0.00	2840	7660

[1] F.A. - Fuel Allowance [2] Condemnation percentage could not be divided by house
[3] Lower gas usage and increased electrical usage in House #3 is a reflection of wood pellet furnace installed on this flock.

Manager's Comments on Flock 48

The wood burning furnace project in House 3 continued, but warmer weather prevented an ideal testing climate. Data collection will resume in October when cooler weather returns. House 1 had both the best feed conversion and the heaviest chicken. While House 1 also had the best feed conversion on Flock 47, this is not a consistent pattern. Over time, all four houses are quite similar in performance. We have not proved that one construction style (steel vs wood) or one ventilation style (conventional vs tunnel)produces consistently better results. Caked litter removal from the houses after the flock sold was as follows: House 1 - 1 load, House 2 - 2 loads, House 3 - 2 loads and House 4 - 1 load.

PRODUCTION SUMMARY: FLOCK 49 (May 31, 1999 - July 27, 1999)

HSE (No)	FEED CONV (LB/LB)	HEAD PLACED (No)	SOLD (No)	HEAD LIV (%)	AGE (D)	WT (LB)	AVE BIRD COND (%).	COST ($)	FEED COST ($)	CHICK COST ($)	MED. COST ($)	TOTAL COST/LB (Cent)	PAY/LB (Cent)	F.A.[1] ($)	GAS USAGE (GAL)	ELECT USAGE (KWH)
1	2.26	17982	17037	94.74	57	5.94	1.44[2]	11446	3057	26.60	14530	14.575	4.7912	0.00	280	5875
2	2.22	17897	17267	96.48	57	6.29	1.44	12059	3042	26.60	15128	14.135	5.2306	0.00	172	5325
3	2.28	17934	16906	94.27	57	6.03	1.44	11609	3049	26.60	14684	14.605	4.7606	0.00	153	6485
4	2.32	17924	16188	90.31	57	6.02	1.44	11321	3047	26.60	14394	14.993	4.3725	0.00	448	5111
FARM	2.27	71737	67398	93.95	57.00	6.07	1.44	46434	12195	106.40	58736	14.565	4.8005	0.00	1053	22796

[1] F.A. - Fuel Allowance [2] Condemnation percentage could not be divided by house

Managers Comments on Flock 49

Between flocks 48 and 49 extra fogging nozzles were added in Houses 1 and 3, bringing the total number of nozzles in each house to 74. The 2 fogging lines in each house were winched and the "outside" lines were moved closer to the summer cooling fans along the south wall of each house. These changes were beneficial and these two houses lost a combined total of 400 to 500 birds due to heat stress. House 2, with its somewhat unconventional sprinkler cooling system, produced the heaviest chicken and had the best feed conversion. Caked litter removal from the houses with the decaking machine after the flock sold was as follows: House 1 - 5 loads, House 2 - 7 loads, House 3 - 8 loads and House 4 - 2 loads.

UA Poultry Science Extension Specialists

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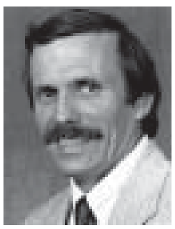

Dr. Frank Jones, Extension Section Leader, received his B. S. from the University of Florida and earned his M. S. and Ph.D. degrees from the University of Kentucky. Following completion of his degrees Dr. Jones developed a feed quality assurance extension program which assisted poultry companies with the economical production of high quality feeds at North Carolina State University. His research interests include pre-harvest food safety, poultry feed production, prevention of mycotoxin contamination in poultry feeds and the efficient processing, and cooling of commercial eggs. Dr. Jones joined the Center of Excellence in Poultry Science as Extension Section Leader in 1997.

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Dr. John Marcy, Extension Food Scientist, received his B.S. from the University of Tennessee and his M.S. and Ph.D. from Iowa State University. After graduation, he worked in the poultry industry in production management and quality assurance for Swift & Co. and Jerome Foods and later became Director of Quality Control of Portion-Trol Foods. He was an Assistant Professor/Extension Food Scientist at Virginia Tech prior to joining the Center of Excellence for Poultry Science at the University of Arkansas in 1993. His research interests are poultry processing, meat microbiology and food safety. Dr. Marcy does educational programming with Hazard Analysis and Critical Control Points (HACCP), sanitation and microbiology for processing personnel.

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Mr. Jerry Wooley, Extension Poultry Specialist, served as a county 4-H agent for Conway County and County Extension Agent Agriculture Community Development Leader in Crawford County before assuming his present position. He has major responsibility in the Arkansas Youth Poultry Program, and helps young people, parents, 4-H leaders, and teachers to become aware of the opportunities in poultry science at the U of A and the integrated poultry industry. He helps compile annual figures of the state's poultry production by counties, and serves as the superintendent of poultry at the Arkansas State Fair. Mr. Wooley is chairman of the 4-H Broiler show and the BBQ activity at the annual Arkansas Poultry Festival.

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Coming Events

January 19-21, 2000
International Poultry Exposition;
Georgia World Congress Center, Atlanta
Contact: U.S. Poultry & Egg Association (770) 493-9401

March 30, 2000
De Queen Poultry Conference;
De Queen High School
Contact: Ralph Tyler, Sevier Co. CES
(870) 584-3013

April 6, 2000
Producer Workshop
Undetermined Location, Missouri
Contact: The Poultry Federation
(501) 375-8131

April 11-12, 2000
Arkansas Poultry Sympsoium;
Holiday Inn,
Springdale, Arkansas

April 13, 2000
Producer Workshop;
Holiday Inn,
Springdale, Arkansas

April 18, 2000
Producer Workshop;
Conway, Arkansas

April 20, 2000
Producer Workshop;
Hope, Arkansas