Kentucky Poultry Federation

Cheeps & Chirps

. . . . . *Points for Poultry Profitability*

VOLUME 1, ISSUE 3

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Poultry House Evaluation Service (PHES) progress

The Poultry House Evaluation project is nearing completion at the Pilgrim's Pride and Tyson Foods, Union City complexes. Plans are currently underway to start poultry house evaluations for the Perdue complex. The application process for the next group of participants will be conducted in August and participating farms will be selected early in September.

The evaluations of the farms so far have identified numerous areas where modifications or upgrades could reduce energy costs and ultimately increase profitability. Here are some examples:

1. Change incandescent lights to cold cathode or compact fluorescents.
2. Clean shutters & fans.
3. Replace worn fan belts.
4. Check all fans to ensure that the motor has the correct size drive pulley.
5. Insulate the attic.
6. Insulate and cover the sidewall curtain opening.
7. Re-insulate the sidewall below the curtain opening.
8. Seal cracks between the bottom of the sidewall and the top of the concrete foundation wall.
9. Seal cracks along the ceiling line at the ends of the barn.
10. Seal cracks around end wall doors.
11. Move sidewall fan thermostats out of the direct airflow pattern from forced air heaters.
12. Cover and seal tunnel curtain inlets (commercial tunnel inlet doors is one option).

Each of these modifications or upgrades has its own associated costs and payback period and are farm specific.

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Jacquie Jacob joins the Energy Efficiency Project

Jacquie Jacob recently joined the University of Kentucky and will be working on the Poultry Energy Efficiency project. Although Jacquie is Canadian, she has lived in the U.S. for the last 13 years and now considers it her home.

Jacquie received her Bachelor's degree in 1981 from the University of British Columbia (UBC), Canada, majoring in Poultry Science with an emphasis on poultry management.

On completion of her Bachelor's degree, Jacquie spent 4 years in Mozambique working on a poultry project. The project involved introducing egg, broiler and duck production to several agricultural cooperatives in the area. Her work also included the development of a local hatchery and feed mill.

Mozambique was in the middle of a civil war as well as a serious drought for most of the time Jacquie (1982-1986) was there. The feed mill often received donations of seeds which were no longer suitable for planting. Many times the only information she had to work with to formulate diets were the local names for the seeds received.

Jacquie soon recognized the importance of a deeper understanding of nutrition, so in September 1986 she returned to UBC to complete her Master's degree in Poultry Nutrition. Her research focused on possible causes of Sudden Death Syndrome (SDS) in broilers. Although the incidence of SDS in Canadian broiler flocks is relatively low, it was the main source of mortality at that time. While her research failed to identify the actual cause of SDS, she can tell you want does not cause it.

Jacquie received her Ph.D. in Poultry Nutrition in 1993 from UBC, but she completed her

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Poultry is Kentucky's #1 food commodity with cash receipts totaling $814 million.

The average poultry house has about $700 per month in utility bills.

Energy efficiency assistance and education is critical to continued profitability.

"By working with this representative sample [of producers], we're going to learn what the problems are."

Jacquie Jacob joins the project . . . . .

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research at the University of Nairobi in Kenya. Her research focused on the use of local feed ingredients in broiler and layer diets in an effort to reduce Kenya's reliance on imported corn and soybean meal. The main alternative grain studied was sorghum, with some varieties having up to 13% tannins. The main local oilcakes studied were sunflower and sesame seed.

After completing her Ph.D. Jacquie did a six month postdoc in Swine Nutrition at the University of Alberta as part of a joint project with UBC looking to reduce the nutrient load from animal manures spread on crops. She returned to UBC as a Research Associate overseeing a series of research projects related to reducing nitrogen and phosphorus excretion of broilers and layers. The lower mainland of B.C. sits on an aquifer that supplies drinking water to the area, including northern Washington State. Even if all the agricultural land in the area used poultry manure as their sole source of fertilizer, there would not be sufficient land available to handle all the manure produced. And this does not take into account the swine and dairy manures also produced in the area.

In 1995 Jacquie accepted a position with the University of Florida as the Poultry Extension Coordinator publishing several poultry-related Fact-sheets, organizing educational workshops for the Florida broiler and egg industries, and assisting with the poultry youth programs (4-H, FFA, Embryology in the classroom).

In 2001 Jacquie moved to Minnesota as an Assistant Professor in the Department of Animal Science, again with a heavy extension appointment working the broiler and egg industries, alternative poultry producers and youth. Her area of research was organic poultry nutrition.

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KPF Scholarship Applications

Through the generosity of our members and allied companies, a scholarship program has been established to assist graduating high school students or students currently attending a college or university to continue their education.

The Kentucky Poultry Federation Board of Directors and members established this fund to help young students continue their academic careers or receive additional training in another area beyond high school.

Three $1,000 scholarships will be awarded during our Kentucky Poultry Festival Hall of Fame Banquet on October 4, 2008.

- One scholarship will be awarded to a student who is pursuing a major in agriculture.
- Two other scholarships have been created to benefit the children and grandchildren of our poultry complexes employees and growers. One of these scholarships has been specifically earmarked for a child or grandchild of a poultry grower who is a member of the Kentucky Poultry Federation.

To be considered for the Kentucky Poultry Federation scholarships you **must be enrolled for the Fall 2008 semester** at a college, university or technical training program. The recipient **must be a resident of Kentucky**. The scholarship **application deadline is Friday, September 5, 2008**. For more information or to access an application form, and the rules and regulations please logon to the KPF website at http://www.kypoultry.org

What do you want to read about?

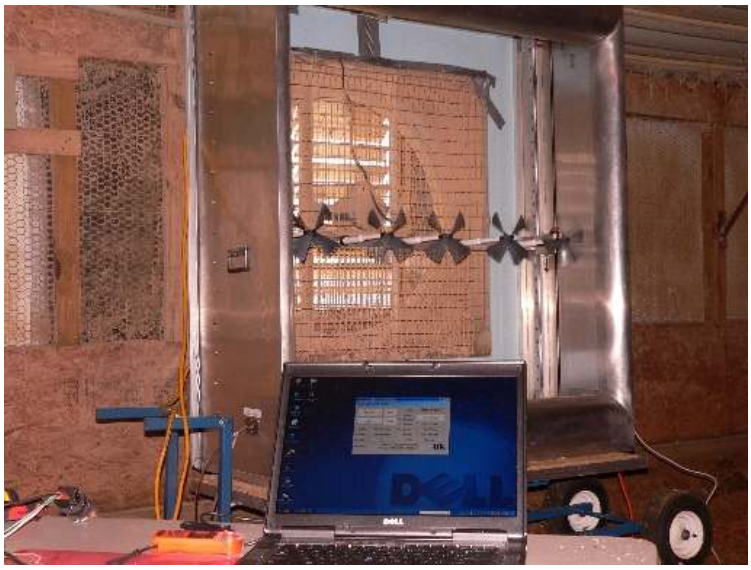
We want to know what you want to read about.
Please e-mail topics of interest to **melissamiller@kypoultry.org.**

The Fan Assessment Numeration System (FANS)

The FANS unit used in the research summarized below is the same unit used by the Poultry House Evaluation Service.

The FANS unit uses a horizontal array of five propeller anemometers (the instrument used for measuring wind speed) to obtain real-time airflow measurements as the array is moved up and down along the fan. With the aid of a computer, approximately 1.8 million air speed readings are obtained in the three minutes it takes for the instruments to move up or down across the fan. The average speed is multiplied by the effective cross-section area of the FANS unit to obtain the mean air flow rate.

To test a fan, the FANS unit is positioned in front of the fan and sealed to the wall using duct tape. Measurements are taken at six static pressures ranging from free air to approximately 0.20 inches of H_2O.



On-farm ventilation fan performance evaluations and implications

K.D. Casey, R.S. Gates, E.F. Wheeler, H. Xin, Y. Liang, A.J. Pescatore, and M.J. Ford. 2008. Journal of Applied Poultry Research. 2008. Volume 17:283-295.

Ventilation systems are designed to provide adequate air flow and air exchange so that all the broilers in a house receive a constant supply of fresh air and so that the correct temperature and humidity is maintained within the broiler house. Fans are a critical component of mechanical ventilation, with proper environmental control relying on adequate fan capacity. When fans are installed in a poultry house they are typically fitted with shutters and guards, both of which can reduce air flow. Shutters typically reduce air flow and efficiency by 10-25%, depending on whether they are on the intake or discharge side of the fan. Guards are less of a concern since they typically reduce airflow and efficiency by less than 3%.

This publication reports on the results of field work using the Fan Assessment Numeration System, or FANS for short. Measurements of fan performance in eight broiler houses on two farms were obtained using the FANS unit.

It typically took 30 minutes to complete the measurements of a single fan, and another 30 minutes to reposition the unit on the next fan. A poultry house with 11-14 fans could be characterized in one day. The measurements were taken between flocks when the houses were empty. The evaluations took place over a nine month period.

As expected, fan performance varied considerably, even for the same type of fan. For example, for the 48-inch fans the best performer moved 16,480 cubic feet per minute (CFM) while the worst performer moved only 12,654 CFM, a 23% difference.

Part of this variation in performance was attributed to the condition of the shutters. Dirty, corroded, or damaged shutters were found to impose a significant resistance that the fans had to operate against resulting in reduced air flow.

There were two types of shutters used on the fans studied — aluminum and plastic. The aluminum shutters had the greatest impact on air flow, primarily by design, but also because they were older and had more accumulated dirt, corrosion and damage than the plastic shutters.

Another factor affecting fan performance was the condition of the motor. For the 48-inch fans, a small reduction in fan speed from slipping or worn belts resulted in a large reduction of air flow. The results indicate the importance of fan maintenance for ensuring optimal fan performance, including checking belt tension and replacing worn belts.

Energy efficiency of a fan is typically expressed as volumetric airflow (CFM) per watt (W) of power consumed, at the expected operating static pressure. It is best to select tunnel ventilation fans with efficiencies greater than about 20 CFM/W at 0.1 in H_2O. The fans evaluated in this study had a wide range of energy efficiencies—6.4 CFM/W to 16.8 CFM/W, with an average of 14.0 CFM/W. It can therefore be concluded that the fans evaluated on the two farms in this study are not energy efficient.

Not all fans in a broiler house are run for the same period of time; instead the use of each fan depends on their specific use and ventilation stage assignment. An electronic controller can be used to reorder fan staging such that the most efficient fans are used where the greatest demand is. This would reduce running costs as well as assure a more even wear of the fans in a house. It is also important to identify low-performing fans and replace them with high-performance fans.

The same FANS unit is currently being used as part of the Poultry House Evaluation Service. Fan performance, building inspections, and infrared imaging are being used to make recommendations for upgrades which will reduce energy consumption in broiler houses.

Summary written by
Dr. Jacquie Jacob
University of Kentucky

FINDINGS OF THE POULTRY HOUSE EVALUATION SERVICE: Example

Note: The example below is for a specific farm only and does not generally apply to all farms. Fuel savings will vary from farm-to-farm. This is an example only.

Farm A — Four house broiler farm brooding eight flocks per year

Improvement	Estimated cost[1]	Fuel saved	Unit	% Saved[2]	Unit cost	Projected annual savings	Simple Payback[3] (years)
Energy Components							
Insulate curtain opening	$ 15,940	3836	gal	14.5	$ 2.00	$ 7,672	2.1
Insulate ceiling	$ 11,880	2460	gal	9.3	$ 2.00	$ 4,920	2.4
Insulate tunnel inlet doors	$ 19,600	1784	gal	6.8	$ 2.00	$ 3,568	5.5
SUBTOTAL (propane)	***$ 47,420***	***8,080***	***gal***	***30.6***	***$ 2.00***	***$ 16,160***	***2.9***
Change from incandescent to cold cathode lights	$ 2,486	47,520	kWh	29.7	$ 0.10	$ 4,752	0.5
TOTAL	**$ 49,906**					**$ 20,912**	
		TOTAL PROJECT BENEFIT				***$ 20,912***	***2.4***

[1]Installed cost, including labor and materials
[2]Current annual propane use = 26,399 gal; Current annual electrical use = 159,871 kWh
[3]Estimated period of time for initial cost recovery

Bird Flu — Information for hunters and taxidermists

Avian influenza, or bird flu, is a virus that causes disease in chickens, turkeys, pheasants, quail, ducks, and geese. It may also cause disease in other birds as well. There are many types of avian flu, and some forms are worse than others. A strain of H5N1 is a form of bird flu that is currently in Asia, Africa, Europe, and the Middle East. It is the worst known outbreak of bird flu in domestic birds. H5N1 is a fatal disease in domestic poultry. H5N1 is easily passed from bird to bird. To date, this strain of the H5N1 virus has not been found in North America.

The bird flu virus is spread via the bodily fluids and feces of infected birds. Wild birds, especially waterfowl and shorebirds, are natural hosts for the virus. They may not show signs of the disease, even if infected. Some of the other species which may be able to catch the bird flu virus include pigs, primates, ferrets, rodents, rabbits, cats, and humans.

Migratory birds travel between North America and parts of the world where H5N1 has been seen. It is unknown if migratory birds can spread H5N1 to North America. The Kentucky Department of Fish and Wildlife has been sampling wild birds to monitor the situation locally.

The risks to hunters and taxidermists are minimal but they can help protect against bird flu as well as other diseases and parasites by taking the following precautions:

- Limit exposure to feces and bodily fluids from game animals.
- Do not handle or process birds

Federal funding opportunities

As an outgrowth of this project and the accompanying grower education programs, there has been increased awareness of Federal grant funds available to help with projects which increase energy efficiency.

Funds are available to farmers, ranchers, and rural small business as part of the 2002 Farm Bill, specifically under section 9006: Renewable Energy and Energy Efficiency program.

As an outgrowth of the Poultry House Evaluation Service, four 9006 grant applications were filed by Kentucky poultry growers this fiscal year. This was the first time that Kentucky poultry growers applied for these funds.

This funding opportunity will continue for the next five years since the 2008 Farm Bill contains a similar program, this time under section 9007. The funding in the 2008 Farm Bill is significantly higher than in the 2002 bill and provides an increased opportunity for Kentucky poultry growers to apply.
Section 9007c of the 2008 Farm Bill provides loan guarantees and grants to agricultural producers and rural small business to purchase renewable energy systems (including those used to produce and sell electricity) and to make energy efficiency improvements. The maximum amount of the grant is 25% of the project costs.

Two important criteria that will used in evaluating the applications are:

- The estimated quantity of energy to be produced
- The estimated period of time for cost recovery ('also known as the payback period')

The contact person for this grant opportunity is:

Scott Mass
USDA Rural Development
771 Corporate Drive, Ste 200\
Lexington, KY 40503
Phone: 859-224-7435

Greenhouse Gas Emissions (GHG) from broiler houses: A non-issue?

With the continued heated discussion on agricultural air quality in recent years, you might be interested to know that last year a landmark broiler house emissions study was conducted in Kentucky. It was part of a national Air Consent Agreement between U.S. EPA and poultry & livestock producers, and the first completed in the nation. We wrote about ammonia emissions in Volume 1, Issue 2 of Cheeps and Chirps.

Late June 2008 the first ever report of greenhouse gas emissions from this same study was released to the public. Greenhouse gases measured included carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O) and volatile organic compounds. They are of great concern because of their ability to trap radiation in the upper atmosphere and thereby affect global climate.

CO_2 is the greenhouse gas that we mostly hear about and it is considered the most important; however, methane and nitrous oxide are substantially more potent on a pound-per-pound basis. One ton of methane has the same greenhouse effect as about 20 tons of CO_2, and one ton of nitrous oxide has 300 times the effect of CO_2. Thus even small quantities of these gases are a concern, and both arise from agricultural practices.

Results of the study are very interesting. In summary, the research team found:

- CO_2 emission fro the broiler houses averaged 5.5 tons per 1,000 broilers marketed.
- CH_4 emission for the broiler houses averaged 7.5 lbs per 1,000 broilers marketed.
- N_2O emission for one broiler house averaged 3.8 lbs per 1,000 broilers marketed.

Note that the CO_2 is the largest contributor and most of this comes from broiler respiration, not the litter or feces. If we add up all the greenhouse gas emissions, converting all gases to a "CO_2 equivalent," the total CO_2 equivalent greenhouse emissions from the broiler operations monitored in this study was 5.77 tons, and 88.6% was contributed by CO_2.

How much is this? Well, agriculture contributes about 13% of the world's greenhouse gases emitted each year, estimated at around 49 Giga-tons (metric) of CO_2 equivalent per year. Applying the 5.77 tons (US) of CO_2-equivalent to the annual broiler inventory results in less than 0.1% of the total global greenhouse gases and about 0.6% of the agricultural component. Not very much, it seems.

Source: Burns, R.T., H. Li, H. Xin, R.S. Gates, D.G. Overhults, J.E. Earnest, and L. Moody. 2008. Greenhouse gas (GHG) emissions from broiler houses in the southeastern United States. Paper no. 084649. ASABE International Meeting June 30—July 3. St. Joseph, MI.

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Bird Flu — Information for hunters and taxidermists .....

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found sick or dead.

- Wear rubber or latex gloves and washable clothing while handling game.
- Dispose of internal organs, feathers, bones, skin, and trimmings in a safe manner by double bagging, sealing both bags, and putting it in a the trash.
- Do not eat, drink, or use tobacco products while handling game.
- Wash hands with hot soapy water or alcohol wipes immediately after handling game.
- Clean all tools and work surfaces with hot soapy water then disinfect with 10% chlorine beach solution or other disinfectant.
- Thoroughly cooked meat is safe to eat. Poultry should reach an internal temperature of at least 165°F. Use a meat thermometer.
- Use caution around water source and roosting areas where feces from wild birds may accumulate.
- When finished hunting, clean clothing, boots, vehicle, etc. as soon as possible
- Do not bring game birds onto poultry farms.

Call the U.S. Department of Fish and Wildlife at (866) 4US-DAWS or the Kentucky Department of Fish and Wildlife at (800) 858-1549 ext. 352 to report sick or dead wild birds. Because waterfowl are the greatest risk, call to report any number of sick or dead waterfowl. For any other type of wild bird, only call to report if there are 5 or more dead birds.

For more information on bird flu check online at: http://www.ca.uky.edu/anr/avian_influenza.htm.