Kentucky Poultry Federation

Cheeps & Chirps

.... Points for Poultry Profitability

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INSIDE THIS ISSUE:

ADDING MORE FANS? CHECK YOUR ELECTRIC SUPPLY

So, you need to add two additional tunnel fans in each broiler house to meet new air speed requirements. Obviously, operating more fans will require more power for each house. Do you know if you have enough electrical capacity to supply the additional load?

A typical broiler house in Kentucky has a maximum electrical load between 50 and 70 amps at 230 volts. The corresponding maximum power demand is between 10 and 15 kilowatts per house. Houses with incandescent lighting are likely to have loads near the upper half of that range while houses with fluorescent lighting are more likely to have loads in the lower half of the range.

Expect two additional tunnel fans (1 or 1.5 hp each) to add between 10 and 16 amps of additional load to each house, which equals about 20 to 25% of the existing load. Thus, adding 2 tunnel fans per house is nearly equivalent to adding the peak power requirement of one additional broiler house to the overall electrical system on a 4-house farm.

Back issues of Cheeps and Chirps, as well as other information, are available at www.poultryenergy.com

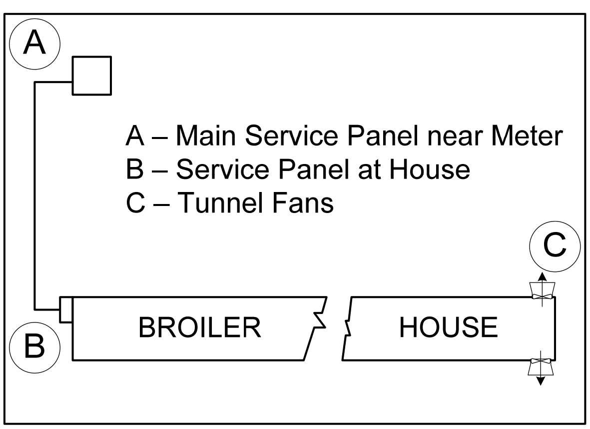


Figure 1. Measurement points for a full load voltage test on a broiler farm

A "full load" voltage test is one way to determine if the existing system has enough capacity for the additional fans. Figure 1 shows a schematic layout of typical electrical distribution on a broiler farm. Points A, B, and C are critical locations where voltage measurements should be made.

Point A is at the main disconnect near the power supplier's meter. Point B is at the breaker panel in a broiler house, usually in the control room which could be at the end of the house. If the same size wire is used to feed all houses from the metering location, point B will be at the house where the breaker panel is the farthest distance from the meter. If different wire sizes are used to feed different houses, there will be two or more locations for point B. Always select the house that is the farthest distance from the meter for each different feeder wire size. Point C will be at the tunnel fans in the same house(s) that is used for point B.

Begin by turning off all power to all houses and measure voltage at point A. This is a "no load" condition. Next, restore power to all houses and power up the equipment in all houses that would be operating under maximum load conditions. Maximum load is usually in the summer with all tunnel fans, lights, evaporative cooling pumps, and feed systems operating. It may not be practical to operate the cooling pumps and feed systems at the time a test is conducted, so use at least two (preferably four) of the 36-inch exhaust fans as substitutes for pumps and feed lines. Adjust air inlets so the static pressure is similar to operating conditions during summertime tunnel ventilation. The objective is to simulate an actual "full load" operating condition as nearly as possible.

Once the full load operating condition is established, measure voltage at points A, B,

(Continued on page 2)

DEPARTMENT OF LABOR DROPS YOUTH LABOR RULE

The Department of Labor originally proposed a rule that would regulate agricultural work by children under the age of 16. The proposed rule received thousands of comments expressing concerns about the effect of the proposed rules on small, family-owned farms.. As a result, April 26 the Department of Labor withdrew the proposed rule.

Instead, the Departments of Labor and Agriculture will work with rural stakeholders to develop an educational program to reduce accidents to young workers and to promote safer agricultural working practices.

ADDING MORE FANS? CHECK YOUR ELECTRIC SUPPLY *continued*

(Continued from page 1)

and C and record the measurements. Under full load, voltage drop (or difference) should not be greater than 7 volts (3%) between points A and B. It should not be more than and 5 volts (2%) between points B and C. Some example results for two different farms are given in columns 3 and 5 of Table 1.

The measurements from Farm X show a 6 volt drop in the feeder circuit from the meter to the house (A to B) and a 4 volt drop from the breaker panel to the fans (B to C) under full load. Both parts of the circuit are within acceptable limits. This farm has some reserve capacity to accommodate more fans.

In column 4, an estimate is given for the voltage that would occur when 2 tunnel fans are added. The estimate is calculated by adding 25% to the existing voltage drops from transformer to meter and meter to house (A to B). With 2 more fans, the voltage drop from the meter to the house (A to B) increases by about 2 volts. Since new fans would be wired on new circuits in the house, the voltage drop between points B and C should be near the same as it is for existing fans, about 4 volts. The new total voltage drop between points A and C is now 11.5 volts (7.5 plus 4) and is still within acceptable limits.

Farm Y presents a different picture. Compared to Farm X, the no load voltage at the meter is actually slightly higher, but the full load voltage at all points in the system is lower. The system at Farm Y has a 12 volt (5%) drop between the meter and the fans (A to C) under full load conditions. It is already fully loaded! If 2 more fans are added to each house, the estimated voltage (column 6) at point C will decrease to about 221 volts.

Fan motors are rated to operate at 230 volts. Although they will operate at lower voltages, they will draw extra current (amps) and their internal temperature will increase. The motor's thermal overload will stop the motor periodically if it overheats, and repeated occurrences will likely shorten the life of the motor. A thermal overload condition is most likely to occur at a critical time when the need for maximum ventilation is greatest. Thus, the electrical system should be

(Continued on page 4)

Table 1. Example voltage measurements from a full load test at two farms.

		Farm X		Farm Y	
Load	**Location**	**Existing**	**+ 2 fans**	**Existing**	**+ 2 fans**
No Load	Meter (A)	245	245	247	247
Full Load	Meter (A)	240	239	237	235
Full Load	House (B)	234	232	230	226
Full Load	Fans (C)	230	228	225	221

LOWER ENERGY PRICES

There is some good news on the energy cost front. Propane prices have gone down – way down.

The spot price of propane at Mont Belvieu, TX recently dropped under $0.80 per gallon, and August futures have also been under $0.80 per gallon. Mont Belvieu is the location of a major pipeline that supplies propane to Kentucky. Farm contract prices here are typically 20 to 40 cents per gallon above the Mont Belvieu price.

Prices are now about 50% lower than at this same time last year. Not since the summer of 2009, which was immediately after the current economic recession began, have prices been lower. Before 2009, the spot price had not been below $1.00 per gallon for any significant length of time since 2005. The accompanying graph shows a recent history of the Mont Belvieu spot price.

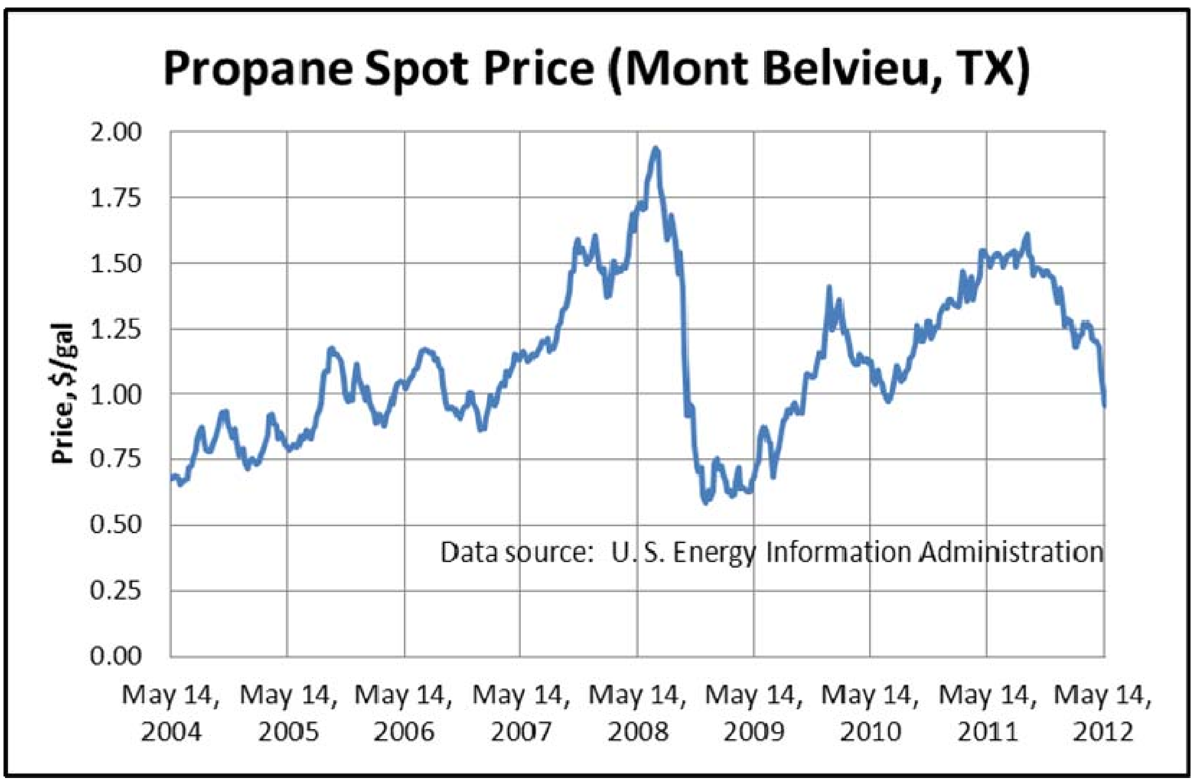
Propane is a by-product of refining oil and processing natural gas. The price of propane usually follows the price of oil but it also varies seasonally. Prices are typically highest in the winter and lowest in the summer.

This year, a combination of factors caused propane prices to decline from winter highs much more dramatically than usual. Mild temperatures last winter significantly reduced propane demand for heating. Natural gas production and processing has increased substantially, which has produced more propane by-product as well as reducing the cost of natural gas fuel. Also, some propane users have switched their fuel source to natural gas in order to reduce their energy costs. As a result, current stocks of propane are about 60% higher than at this time last year and about 30% above the previous 5-year average. The unusually large amount of propane in storage is pushing the current price much lower than it has been in the past few years.

At this time, the futures price through August indicates some potential for additional price declines. It is possible that growers may be able to secure their winter propane supply for a price near $1.00 per gallon sometime this summer. If that scenario develops, it will be one of the lowest prices in the past several years and could give growers some welcome relief from their recent high fuel costs.

Poultry growers should stay in close contact with their propane supplier and keep a sharp eye on the propane price this summer. It appears that growers may have some favorable pricing opportunities for their winter fuel supply over the next few months.

By Doug Overhults, University of Kentucky Department of Biosystems and Agricultural Engineering



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ADDING MORE FANS? CHECK YOUR ELECTRIC SUPPLY *continued*

(Continued from page 2)

designed to keep voltage at the fan as close to 230 volts as possible.

Solutions – Excessive voltage drop is a function of both wire size and the length of the circuit. Many voltage drop problems on broiler farms can be traced to undersized wiring from the meter to the house (A to B). Sometimes, there can be a similar problem with the wiring between the transformer and the meter. There is not much remedy for those problems except to reduce the load or increase the size of the feeder wires in the problem locations. Remember that the problem is likely to be more severe at the houses most distant from the meter. All houses may not require modifications.

Changing from incandescent to fluorescent lighting usually reduces the electrical load by about 15 amps per house. That load reduction is about the same as the load added by two tunnel fans. If your houses still have incandescent lighting and you need to add more fans, now might be a good time to make the change to a different lighting source.

Boosting voltage at the transformer may look like a quick fix but that is not necessarily a good solution. Remember that the system does not operate at full load most of the time. If transformer voltage is increased to meet full load conditions, then the voltage may be too high when the load is moderate or small. The power supplier's target is to supply 240 volts at the meter. If full load voltage at the meter is near that target, then it is probably best to forego any adjustments at the transformer.

Work Safely – A full load voltage test is best done by a qualified electrician. The measurements described above must be made on a live, line voltage system, and it is usually necessary to remove protective covers from some service or disconnect panels when making the measurements. Thus, there is exposure to numerous electrical hazards. It is absolutely essential for the operator to use proper equipment, exercise appropriate caution, and follow good safety practices throughout the test procedure.

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