

Summertime Ventilation Checklist

Hot weather will be here soon and you need to have your poultry houses ready. Dr. Michael Czarick from the University of Georgia provided the following check list for poultry house ventilation systems.

- 1) Replace worn fan belts. Fan belts do not stretch. A fan belt rides in the motor and prop pulleys on its sides. Over time, the sides of the belt wear and as a result it becomes thinner. The thinner a belt becomes the lower it will ride in the motor and prop pulleys and the slower the fan blades will rotate. The slower the fans spins the lower amount of air the fan will move. It is not uncommon for a worn belt to result in a loss of fan capacity of 25%. Since the relationship between air speed and wind chill is exponential, a 25% loss of wind speed can reduce wind chill of possibly 50%! Keep in mind that thought automatic belt tensioners reduce belt slippage and therefore increase belt life, but they do not eliminate the need to replace belts on a regular basis. At a minimum, fan belts should be replaced once a year to insure maximum air moving capacity and therefore bird cooling.
- 2) Replace worn pulleys. If a producer does not replace loose belts the slipping of the belt over the motor pulley will cause excessive wear on the pulley. As a result the motor pulley becomes more “U” shaped rather than “V” shaped. When this happens even a new belt will not ride in the pulleys properly resulting in reduced air moving capacity. This problem can only be solved by replacing the motor pulley.
- 3) Conduct a static pressure test. In houses with evaporative cooling pads it is essential that all the air enters the house through the evaporative cooling pads and not through cracks in the sidewall and ceiling. With one 48” fan operating and the tunnel curtain closed measure the static pressure. Ideally, the pressure will be above a 0.10” pressure. The lower the pressure the more air you have entering through the cracks in the house and not the pads. A static pressure of 0.04” or lower indicates that at least one, possibly two fans are pulling air through the cracks in the house and not the pads. In a study conducted a couple of years ago this amount of leakage was found to increase the temperature of the air at the fan end of the house by as much as five degrees.
- 4) Patch holes in dropped dealings. The temperature of the air in the attic of a dropped ceiling house during the summer can exceed 130° F. If this hot air is allowed to enter a house through holes and gaps in the ceiling vapor barrier the temperature difference between the fan and pad end of a house will rise. Keep in mind that it is three to four times easier for air to enter through a hole in the ceiling vapor barrier than through the evaporative cooling pad.
- 5) Check the speed of the air entering evaporative cooling pads. To maximize cooling it is very important that evaporative cooling pads are kept clean. Clogged pads can result in large temperature differences between the pad and fan ends of a house, reduced wind chill effect as well as increased electricity usage. An inexpensive air velocity meter is one of the best methods of evaluating the cleanliness of evaporative

cooling pads. Standing inside the poultry house place the air velocity meter one to two inches from the center of the evaporative cooling pad. For a six inch pad you should find that the air is moving through the pad at a speed of approximately 350 to 400 ft/min (2" and 4" pads the air velocity should be approximately 250 and 325 ft/min respectively). The lower the air speed the lower the amount of air entering the house. For instance, for a six-inch pad if the air is only moving through the pad at a speed of 300 ft/min, instead of 400 ft/min it indicates that you are bringing in 25% less air than you should be. It is very important that the fans are cleaned, belts/pulley replaced and the house made tight before this test is conducted, because low air speeds through evaporative cooling pads can also be caused by poorly maintained fans or excessive air leakage.

6) Clean evaporative cooling pad distribution system. Make sure the holes in the water distribution pipe are clean to insure that maximum water flow over the surface of the pad can be achieved. Water flowing over the surface of the pad helps to keep the pad clean, eliminates streaking, minimizes mineral buildup, and therefore maximizes cooling. Keep in mind that water flowing over the surface of a pad has a negligible effect on static pressure and therefore does not affect the air moving capacity of your fans.

7) Clean evaporative cooling pad sumps. Dirt in the bottom of evaporative cooling pad sumps provides food for algae and therefore encourages its growth. To minimize algae growth sumps should be dumped weekly.

8) Clean fan shutters. Dirty shutters make it harder for the fans to move air and can therefore decrease their air moving capacity by 20% or more.

9) Check temperature of breakers when tunnel fans are operating with an infrared thermometer. Generally, the temperature of a circuit breaker should not exceed 140° F. If it does, it means the circuit breaker is in danger of "tripping out" due to overloading or maintenance related problems.

10) Make sure that you have spare fan belts, motors, fogging nozzles, PVC pipe fittings, water filters, and circuit breakers.