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Steps in Evaluating Power Ventilation Needs in Utah Turkey Facilities

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Understanding the concept and application of power ventilation in turkey buildings is an important element in achieving efficient year round production of turkeys in Utah. This fact sheet provides a step-by-step guideline for applying power ventilation principles in turkey production.

STEP 1. Determine the age and number of turkeys to be placed in the building.

STEP 2. Calculate the fan capacity that must be available by estimating air needs of the flock raised under Utah conditions. (See Table 1)

Table 1. Cubic feet of air (cfm) recommendation per turkey (Utah).

Gender	Age (weeks)	Minimum cfm
Toms and Hens	0 to 2	0.2
Toms and Hens	2 to 5	0.2 to 0.5
Toms and Hens	5 to 8	0.5 to 1.5
Toms and Hens	10 to 14	1.5 to 3.0
Hens	14 to 17	3.0 to 5.0
Toms	14 to 17	5.0 to 15.0*
Toms	17 to 19	5.0 to 15.0*
Toms	19+	15.0 to 25.0*

* Varies according to moisture, ammonia and temperature conditions.
May need more ventilation during hot weather

STEP 3. Plan adequate fan capacity to accommodate the maximum imagined air needs that might occur under the worst conditions that might be encountered in that building (e.g., extremely humid or hot weather, slight unplanned overcrowding, etc.). Table 2 lists the approximate output range of fan sizes commonly used in Utah turkey buildings. Keep in mind

that specific makes and models of fans may vary considerably according to blade pitch and other structural factors.

Table 2. Approximate output range of fans commonly used in turkey buildings.

Fan diameter	Range of cfm production
18”	1,500 to 2,000
24”	3,000 to 5,000
36”	8,000 to 10,000
48”	18,000 to 20,000

STEP 4. Seal extraneous structural cracks and crevices in the building so *you* control where fresh air will enter. Controlling direction and speed of incoming air is best achieved by mounting rectangular vent boxes along the upper part of sidewalls that automatically adjust to variations in negative pressure (Figure 1). Proper installation of vent boxes will direct the incoming air slightly upwards where it will mix with warmer air and gently fall to bird level. As a rule of thumb, a typical 2.41 to 2.44 ft^2 vent box will accommodate 1500 cfm of fan capacity.

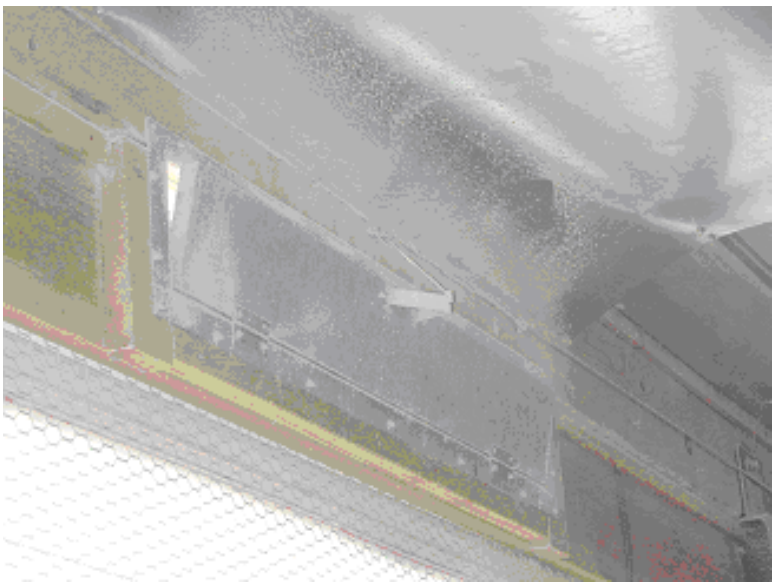

Figure 1. Typical vent box used for regulation of static pressure in turkey buildings.

STEP 5. Measure the static pressure in the building. Static pressure is the slight negative pressure produced in the building when exhaust fans are turned on. It is measured in inches of water column (wc). An inexpensive wall-mounted manometer can be purchased that will measure wc within ranges found in turkey buildings. The USU Turkey Research Center has found the Dwyer® MARK II[1] manometer very acceptable (Figure 2).

[1] Dwyer Instruments, Inc., P.O. Box 373, Michigan City, Indiana 46360 USA

Figure 2. Manometer used for measuring static pressure in turkey buildings.

STEP 6. Adjust air inlets until a static pressure of 0.05" to 0.08" wc is achieved.

STEP 7. Place two or three high/low thermometers in different locations within the building. Check daily to evaluate consistency and degree of temperature control that is present. Day/night temperature variation should be no more than 3º to 5º F in the brooder; in the growout it should not exceed 10º to 15º F.

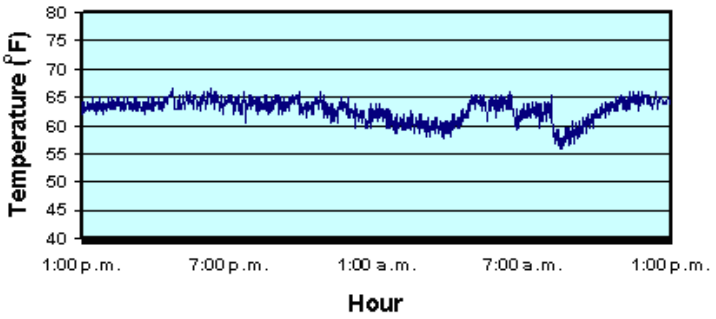

Figure 3. Example of achievable day/night temperature control in a Utah turkey growout.

STEP 8. Stage fan cycles as desired to avoid heat buildup, a stress factor, especially for heavy tom growout houses.

STEP 9. Monitor humidity. This can be accomplished in a number of ways. Small stand-alone humidistats are commercially available that can be mounted to a wall or post. Commercially manufactured computerized poultry building environmental maintenance systems are available that include relative humidity monitoring as at least an optional part of the package.

Litter moisture (in the absence of water spills, disease, or other obvious reasons for an excessively wet litter) may give a rough estimate of the humidity level in a building. To check moisture content of litter, simply grab a handful and squeeze it. Slowly open your hand and observe the physical condition of the compressed ball. If the litter remains compressed in a tight wet ball and/or oozes liquid, it contains excess moisture. If the ball breaks apart slowly and crumbles slightly, litter moisture is optimal. A handful of litter that immediately crumbles into fine particle and does not hold its shape is too dry. Optimal relative humidity in the growout is 40% to 60%.

STEP 10. Periodically adjust fan cycles and environmental control equipment as needed according to moisture level, temperature, and increasing bird growth.

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