Alabama Cooperative Extension System
Auburn University

Poultry Ventilation Pointers

Answers to Your Questions About:

Selecting Poultry House Fans

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1. When choosing a ventilation fan, how should I compare different brands of fans?

Compare cfm and cfm/watt at 0.05 static pressure

Answer: A fan is in simple terms an air pump. The numbers to compare are for cubic feet per minute (cfm), which is how much air is pumped; and then the efficiency number, cfm per watt, which tells you how much (or how little) electric power it takes to pump that many cfm. Both of these rating numbers will vary according to house static pressure, so you want to compare fan ratings (cfm and cfm/watt) at the same static pressure, usually 0.05 inches of water. For both cfm and cfm per watt, the higher the number the better.

It is important also to realize that while manufacturers' literature can be useful, you need to compare fans by using test data supplied by an independent testing laboratory. This insures that the conditions under which the fans are tested will be the same, so you get a true comparison and aren't matching apples with oranges. Fan test conditions, including static pressure, guards, shutters, cones, etc., will be specified in test results.

Get fan comparison data from independent lab tests

Two well-known independent testing labs are the Bioenvironmental and Structural Systems Laboratory at the University of Illinois (known as the BESS Lab) and the Air Movement and Control Association, Inc. (AMCA). Addresses are:

BESS Lab
Agricultural Engineering Department, University of Illinois
332 Agricultural Engineering Sciences Building
1304 West Pennsylvania Avenue
Urbana, Illinois 61801
Phone (217) 333-7964

Air Movement and Control Association
30 West University Drive
Arlington Heights, Illinois 60004
Phone (847) 394-0150

2. Some ventilation fans have cones on them and others don't. What is the advantage of a cone, and how much more do they cost on a fan?

Cones add initial cost but give long-term air-moving and efficiency gains

Answer: Cones increase both the air-moving capacity and the efficiency of a fan. A cone can be expected to increase cfm's by about 7-8%. Fan efficiency should be expected to improve by 15% to 20% just by using a good cone. Some cones are fiber glass, some are galvanized steel. Generally, steel cones are less expensive than fiber glass. A galvanized steel cone on a 48-inch diameter fan might add $100 to $125 to the cost.

3. What is a slant wall fan and why is it different from a normal flush mounted fan?

Answer: A slant wall fan is mounted in a housing which causes the fan itself to be tilted slightly downward. This accomplishes several things. It allows you to mount the shutter on the inside of the poultry house, which makes it easier to clean the shutter, thus improving air flow. There is some increase in efficiency of slant wall fans in comparison to panel fans. This gain in efficiency is not extremely high, say approximately 2% to 3%. The real reason to buy a slant wall fan is for ease of maintenance and cleaning of the shutter. So it is important to look at the price difference in a slant wall fan in comparison to a standard panel fan when making the decision whether to buy slant wall or not.

Slant wall helps performance by making maintenance easier

4. Some companies make both belt and direct drive ventilation fans, which one is best? And what are the advantages and disadvantages of each?

Answer: Since in most poultry houses we use both 36-inch diameter fans and 48-inch diameter fans, sometimes the decision as to whether to use direct or belt drive fans should be looked at depending on fan size. For 36-inch fans the advantages and disadvantages of direct drive are generally**:**

Direct drive involves trade-off gains & losses

Advantages:
1. lower initial cost
2. less maintenance
3. less performance variance due to maintenance

Disadvantages:
1. less efficient
2. less air flow
3. louder

Drive type decision depends on fan size and how it is used

The 36-inch fan is usually used as a mixing or minimum ventilation fan, where it is most important for the fan to be rugged, low maintenance, and long life. This fan is usually not run 24 hours per day, 7 days a week, and efficiency and maximum air flow may not be the main reason for purchasing the fan. It is every grower's individual decision, but in the case of a 36-inch minimum ventilation fan, a direct drive would make much more sense than in the case of a 48-inch fan.

Belt drive pays off for 48-inch cooling fans

With a 48-inch diameter fan everything changes. The biggest use for a 48-inch fan is to move a lot of air on what is often a continuous basis. A 48-inch fan used this way should be a highly efficient fan, to keep the electric bills down. While a 48-inch direct drive fan is fairly efficient, it doesn't move as much air when compared to a belt drive version.

Maintenance makes a difference!

For 48-inch fans which are running continuously for long periods of time, the greater air flow and fan efficiency of the belt drive makes this the best choice unless there are some other reasons to choose direct drive. Of course if you are not going to keep the belts tight or check them for wear, the direct drive would be your best choice.

The "Answers to Your Questions About:" series of *Poultry Ventilation Pointers* is based on actual questions raised by poultrymen in meetings and in the field. Have a question or two of your own? Write or call Jim Donald, Agricultural Engineering Building, Auburn University AL 36849, 334-844-4181.

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