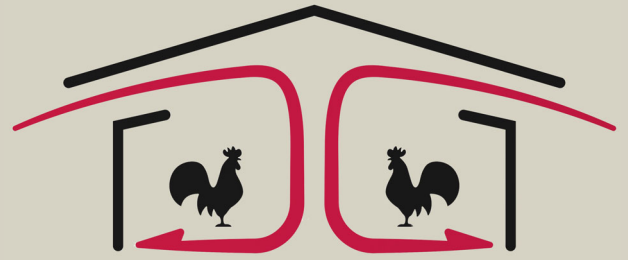




Poultry Housing Tips

Best Performing Tunnel Fans 2023

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When building a new house or retrofitting an older one, tunnel fan selection is one of the most, if not the most important decision a producer has to make. A house's fans are essentially the engine of the ventilation system and as a result have a significant effect on a producer's ability to maintain the proper environmental conditions throughout the year. Furthermore, with rising electricity prices, selecting the right energy-efficient fan can save a producer thousands of dollars a year. As a result, when selecting fans it is crucial that a producer compares fans not just on initial cost, but on fan performance and operating costs as well.

The University of Illinois BESS Laboratory website is the leading source for agricultural fan performance data (www.bess.uiuc.edu). Along with a fan's air-moving capacity at various static pressures, BESS Laboratory provides producers information on a fan's energy-efficiency rating (cfm/watt), air-flow ratio (an indicator of how well the fan holds up under high static pressures), shutter location/type, motor model number, fan speed, and a variety of other potentially valuable details.

Air speed	Design Static Pressure
500 ft/min	0.09" - 0.12"
600 ft/min	0.12" - 0.15"
700 ft/min	0.15" - 0.18"
800 ft/min	0.18" - 0.21"

Table 1. Air velocity and corresponding design static pressure for a traditional tunnel-ventilated broiler house.

When selecting a tunnel fan it is crucial to know the maximum static pressure the fans will be operating under. For broiler houses, the maximum static pressure typically ranges between 0.10" and 0.20". Though factors such as pad area/maintenance, deflector-curtain installation, and tunnel door installation/operation will have an effect on the maximum operating static pressure, the primary

factor which determines the maximum expected static pressure is air speed. Table 1 illustrates the typical pressure range the tunnel fans will experience under various design air velocities. The actual maximum pressure experienced can vary significantly with the aforementioned variables as well as house length, fan maintenance, and house tightness.

A fan's energy efficiency rating is similar to a car's mileage rating. Instead of speaking in terms of miles per gallon, when comparing fans we look at how many cubic feet per minute the fan can move with a single watt of power (cfm/watt). As with a car's mileage rating, the higher the cfm/watt the more energy efficient the fan.

A fan's air-flow ratio is another important factor to consider when purchasing a fan. A fan's air-flow ratio is an indicator of how well the fan will hold up as static pressure increases due to factors such as dirty shutters, dirty pads, or the presence of baffle curtains. A fan's air-flow ratio is determined by dividing how much air it moves at 0.05" by how much air it moves at a static pressure of 0.20". The higher the rating the less the fan is affected by high static pressure.

Table 2 lists the top performing tunnel fans (48" to 61", fixed speed, 230V/Single phase, 60 hz) based on the published test results produced by the BESS Laboratory through July, 2024. The fans in Table 2 have an energy-efficiency rating of at least 20.8 cfm/watt @ 0.10" static pressure and have an air-flow ratio of at least 0.76, representing approximately the top 10% of all tunnel fans tested by the BESS Laboratory.

Though fan performance is of course very important, it is equally important to keep in mind that there are other factors to consider when purchasing a fan, such as quality of construction, local dealer reputation, warranty, and type of shutter.

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Manufacturer	Test #	Model	Diameter	Cone	Shutter	Cfm (0.10")	Cfm/W (0.10")	AFR
Acme	07204	BDR54J	54"	Y	A	23,500	24.5	0.76
Acme	07206	BDR54J1	54"	Y	A	25,900	22.7	0.81
Acme	02207	BDRV54J2-C2	54"	Y	A	25,800	22.5	0.79
Acme	02210	BDRV54J-C2	54"	Y	A	24,400	22.4	0.77
Acme	02214	BDRV54J-C3	54"	Y	A	24,200	22.2	0.76
Acme	02217	BDRV54J2-C3	54"	Y	A	25,400	22.2	0.79
Acme	04274	DDPSV54J-C	54"	Y	A	23,800	22.1	0.77
Acme	04278	DDPGV54J-C	54"	Y	A	24,700	21.8	0.76
Acme	18193	BDR54K-C3	54"	Y	A	24,600	21.7	0.79
Acme	00245	BDR54J-C	54"	Y	A	24,500	21.4	0.79
Acme	00207	DDPS48J-C	48"	Y	A	19,100	21.3	0.77
Acme	17354	BDR54J-6	54"	Y	A	26,200	21.3	0.81
Acme	02209	BDRV54J1-C2	54"	Y	A	25,500	21.1	0.77
Acme	17336	BDR54J-1	54"	Y	A	26,500	21.1	0.82
Acme	17355	BDR54J-7	54"	Y	A	26,400	20.8	0.81
American Coolair	10238	MNBCC54L	55"	Y	A	25,600	23	0.77
American Coolair	10236	MNBCE54M	55"	Y	A	28,100	21.5	0.81
American Coolair	10255	MNEFCE54M	55"	Y	A	26,000	21.5	0.80
American Coolair	16346	FGXM54M	54"	Y	B	28,300	21	0.79
AP-Cumberland	08154	6603-7082	54"	Y	A	25,800	23.8	0.81
AP-Cumberland	08155	6603-7090	54"	Y	A	26,700	23.4	0.83
AP-Cumberland	17304	77-0183, 77-0183-K	58"	Y	B	26,700	22.6	0.78
AP-Cumberland	14183	77-0149-IB, 77-0161-IB	54"	Y	B	25,800	21.6	0.77
AP-Cumberland	14158	77-0148-IB, 77-0160-IB	54"	Y	B	26,100	21.2	0.78
AP-Cumberland	15334	77-0173	54"	Y	B	26,000	21.2	0.80
AP-Cumberland	15336	77-0175	54"	Y	B	26,500	21	0.81
AP-Cumberland	04343	6603-0606	52"	Y	A	25,300	20.8	0.78
Choretime	21076	53464-22	57"	Y	B	27,000	22.9	0.78
Choretime	21082	54659-22	57"	Y	B	26,200	21.2	0.78
Choretime	12614	53464-22	57"	Y	B	27,100	23	0.78
Choretime	09081	52157-22	54"	Y	B	25,800	22	0.78
Choretime	13591	54659-22	57"	Y	B	26,400	21.7	0.77
Choretime	04336	49451-22	48"	Y	B	19,700	21.6	0.76
Choretime	04326	49515-22	48"	Y	B	19,600	21.3	0.77
Choretime	05192	49511-22	52"	Y	B	24,600	21.2	0.76
Choretime	05186	49519-22	52"	Y	B	24,500	20.8	0.76
Grower Select	24059	AS-57EBPGA-PRO	56"	Y	B	30,000	21.2	0.77
Multifan	16837	C4E14P5	54"	Y	A	27,800	25.5	0.78
Multifan	16840	C4E14P2	54"	Y	P	29,100	23.1	0.82
Multifan	16162	C4E14K1	54"	Y	A	26,700	22.8	0.79
Multifan	16835	C4E14P4	54"	Y	A	32,000	21.6	0.86
Multifan	16832	C4E14P1	54"	Y	P	31,300	21.3	0.85
Multifan	16860	C4E14K2	54"	Y	P	29,000	21.1	0.81
Multifan	19389	C4E13K2 / ALU	50"	Y	A	21,800	21.1	0.77
Multifan	16683	S4E14K0	54"	Y	P	26,100	21	0.79
Multifan	16682	S4E14K0	54"	Y	A	26,000	20.9	0.80
Multifan	17403	G4E14K2-cone	54"	Y	G	22,200	20.9	0.76
Multifan	16190	C4E14K2	54"	Y	A	30,100	20.8	0.82
Munters Aerotech	06141	WF541T1CEJ	54"	Y	A	26,000	22.3	0.77
Munters Aerotech	15181	WM541F1CB	54"	Y	B	27,200	22.3	0.77
Munters Aerotech	06139	WF541T1CEP	54"	Y	P	25,600	21.7	0.76
Munters Aerotech	07390	WF541V1CD	54"	Y	B	25,900	21.7	0.77
Munters Aerotech	15003	WM541G1CD	54"	Y	B	27,000	21.1	0.80
Munters Aerotech	06115	WF541T1CJ	54"	Y	A	25,400	20.9	0.77
Pro Terra Systems	09081p	A52157-22	54"	Y	B	25,800	22	0.78
Pro Terra Systems	04336p	A49451-22	48"	Y	B	19,700	21.6	0.76
Pro Terra Systems	04326p	A49515-22	48"	Y	B	19,600	21.3	0.77
Pro Terra Systems	05192p	A49511-22	52"	Y	B	24,600	21.2	0.76
Pro Terra Systems	05186p	A49519-22	52"	Y	B	24,500	20.8	0.76
Val-Co	15646	954205	54"	Y	A	27,100	22.3	0.79
Val-Co	17057	954725	54"	Y	A	27,300	22.1	0.76
Val-Co	15647	954200	54"	Y	A	27,000	21.9	0.76
Val-Co	15664	954206	54"	Y	A	26,600	21.8	0.80
Val-Co	16539	954710	54"	Y	A	27,000	21.6	0.78
Val-Co	16521	954605	54"	Y	A	27,200	21.4	0.81
Val-Co	16556	954606	54"	Y	A	27,200	21.3	0.81
Val-Co	16534	954290	54"	Y	A	26,500	20.8	0.79
Val-Co	24067	957595	57"	Y	B	29,900	21.6	0.77
Val-Co	24077	957555	57"	Y	B	29,400	22.5	0.77

Table 2. Alphabetical listing of top performing tunnel fans as tested by BESS Labs as of July, 2024 (A=Aluminum Shutter, G=Galvanized Shutter, P=Plastic Shutter, R=Roll Seal Shutter, B=Butterfly Shutter, D=Door)