

**DAIRY FARM  
MANAGEMENT  
BASICS**

A Farm Management Course by  
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**Air Quality - Article 19**

The next several articles will focus on cow-friendly environments for the purpose of:

- Providing cows with a comfortable, healthy environment.
- Building and remodeling facilities with cow comfort and future expandability in mind.

Cows that are comfortable and healthy generally are more productive and more profitable. Thus, it is important to keep cow comfort and cow health in mind when remodeling or building new facilities. Dream of what your future dairy facilities should look like. Then, spend your money wisely by building "it" right the first time. In other words, be sure your plans have provisions for proper ventilation, for proper stall design, for proper pen layout, and for the efficient handling of cattle in a non stressful manner. It's easier to incorporate these concepts into your building and remodeling plans at the time of construction, rather than trying to fit them in sometime later, after the construction has been completed. It helps you spend your capital more wisely and it increases the chance that you will end up with a more workable and a more cow-friendly setup in the future.

Some areas to focus on are air quality, shelters, rest areas, heat stress and social stresses. Let's begin with air quality.

Our goal is to provide fresh air to the lungs without causing a cold draft. This helps to prevent respiratory problems and lung damage, it enhances cows' appetites and milk production, and it boosts their immune systems. The emphasis is on getting stale air out of the barn and replacing it with fresh air, not just circulating the stale air.

Remember, cattle are cold weather animals. Fresh air is more important to them than warm temperatures! As you design your ventilation systems, seek expert advice.

Get good cross flow of air. Open up the south sides of barns, as well as the side walls of pole structures. Pole barns should be constructed with 12-14 foot high eaves. In addition to improving the cross flow of air, this height will also keep heat higher off the cows' backs. Opening the ridge will allow trapped heat, moisture, odors and gasses to escape out the top. Ridge vents should be 2 inches wide for every 10 feet of building width, with the minimum width being 6 inches.

If necessary, install fans to help exchange air. One fan should run continuously in order to exchange about 50 cfm of air per 1000 lb. of body weight. This will help prevent air from getting stale on cold days when there is minimal need to move air. As temperatures increase, you will need additional thermostatically controlled fans, set at around 50 degrees, to exhaust about 200 cfm per 1000 lb. of body weight. For these exhaust systems to work properly, you need a fairly tight barn. To provide fresh air to all areas of the stable, air inlets should be scattered uniformly around the perimeter of the barn. It is highly desirable to locate some air inlets in the calf section of the barn so they are exposed to some fresh air (without drafts) rather than pulling the warm, stale, moisture-laden air from the older cattle over them.

In summer time and on hot days, you need to move much more air. Tunnel ventilation works well for ventilating tie-stall barns in summer. For typical tie-stall barns of average width and height, two 48-inch fans are needed for each row of stalls. That should move air through the barn at about 3-4 mph (about walking speed). The fans are located in one end of the barn, and all side wall inlets are kept closed so all of the air is drawn in through large inlets at the opposite end of the barn. You will need a lot of air inlet space -- about 1 foot of clear opening from wall to wall, or its equivalent, for each 48 inch fan! Controlling the direction of air flow in a tunnel system is very important. Otherwise, dead air spots can develop. Avoid side wall openings, as they tend to shoot air to one side of the barn and create dead air spaces on the opposite side. If end wall openings are insufficient, try lifting floor boards from hay mows and barn floors at the inlet end of the barn. Prevailing winds can also alter air flow in the barn, properly-sized inlets can help reduce this problem by increasing air velocity and "straightening" out the flow of air.

Tunnel ventilation systems are hot weather systems, not year-round systems! When temperatures drop, be careful not to pull too much cool air over cows; you could chill them and set them up for pneumonia. In hot weather, with all of the tunnel fans running, we may be exchanging air every 20 to 60 seconds, depending upon the length of the barn and the number and size of fans. However, in cold weather we would need to run fewer fans, and the air exchange is much less. It takes longer for the air to move from one end of the barn to the other. Thus, it has more time to pick up moisture, germs and odors, and the cows at the exhaust end of the barn are constantly breathing fowl air -- not a healthy situation.



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RICHARD HOOVER	PIONEER	33G26	191.3	19.5	57.0	\$365.30
	NOVARTIS	MAX496	190.9	19.8	55.5	\$363.48
	PIONEER	33A14	204.4	19.7	56.5	\$389.49
COATESVILLE, PA CHESTER COUNTY	NOVARTIS	N6800BT	191.0	19.7	55.5	\$364.05
	PIONEER	33Y09	191.4	18.8	57.0	\$368.23
	NOVARTIS	MAX607	192.2	21.3	55.0	\$380.15
PLANTED 4/30/98 HARVESTED 10/23/98	PIONEER	32K61	190.9	19.3	58.0	\$365.46
	NOVARTIS	N7639BT	203.4	20.2	55.0	\$385.68
	PIONEER	3335	212.7	19.5	57.0	\$406.25
GROFF VALLEY FARM LANCASTER, PA LANCASTER COUNTY	PIONEER	3384	160.9	21.6	56.0	\$300.57
	DOEBLER'S	82XP	138.7	30.3	52.0	\$234.97
	PLANTED 5/14/98	HARVESTED NOT ENTERED				
SAMUEL TAYLOR	PIONEER	3335	173.7	28.5	56.0	\$307.41
	FLD CHOICE	8115	152.8	24.8	54.0	\$275.64
	PIONEER	33Y09	155.5	28.1	56.0	\$270.29
AIRVILLE, PA YORK COUNTY	FLD CHOICE	8111	149.1	28.1	53.5	\$259.10
	PLANTED 5/18/98	HARVESTED 9/10/98				
MARK BRANDT	PIONEER	3293	99.7	28.6	55.0	\$172.32
	FLD CHOICE	9313	106.6	31.1	55.0	\$178.62
	PIONEER	33Y09	117.1	28.1	56.0	\$203.51
SHIPPENSBURG, PA CUMBERLAND COUNTY	FLD CHOICE	9114	103.1	31.2	53.0	\$172.78
	PIONEER	3260	106.0	32.5	55.0	\$174.89
	FLD CHOICE	8415	101.9	31.6	55.0	\$169.95
PLANTED 5/1/98 HARVESTED 9/23/98	PIONEER	3173	105.3	32.6	55.0	\$173.48
	FLD CHOICE	8116	96.8	33.7	53.0	\$157.47
JOHN BURRIER	PIONEER	33G26	141.3	19.6	59.0	\$289.55
	DOEBLER'S	75XP	122.7	19.2	59.5	\$235.06
	PLANTED 4/24/98	HARVESTED 9/25/98				
J TREGO ZIMMERMAN	NOVARTIS	MAX607	133.0	21.5	57.5	\$248.80
	PIONEER	33Y09	142.1	19.8	59.0	\$270.63
	PLANTED 4/28/98	HARVESTED 9/29/98				

COOPERATOR	BRAND	HYBRID	YIELD	MST.	TEST WT.	INCOME/ACRE
KEVIN L DUDROW	DOEBLER'S	679XP	157.3	22.8		\$289.97
	PIONEER	34K77	167.2	20.4		\$316.43
ADAMSTOWN, MD FREDERICK COUNTY	PLANTED 4/25/98	HARVESTED 9/16/98				
EASTALCO CO	PIONEER	33Y09	138.0	17.4	63.0	\$269.29
	PIONEER	33V08	121.9	17.1	61.0	\$238.73
	NOVARTIS	N75-T2	125.0	22.9	59.0	\$230.23
FREDERICK, MD FREDERICK COUNTY	PLANTED 5/1/98	HARVESTED 10/1/98				
EGYPT FARMS	NOVARTIS	MAX607	103.4	19.7	57.0	\$197.00
	PIONEER	33Y18	111.8	17.2	60.0	\$218.62
	GARST	8481	108.2	19.2	58.0	\$203.47
BURKITTSTOWN, MD FREDERICK COUNTY	PIONEER	33G26	101.0	17.7	59.0	\$196.48
	GARST	8342	100.3	20.5	55.0	\$189.52
	PLANTED 4/28/98	HARVESTED 9/26/98				
DAVID TOMS	PIONEER	32K61	98.8	29.0		\$169.86
	HOFFMAN	4625	90.5	37.0		\$141.24
	PLANTED 4/24/98	HARVESTED 9/1/98				
JOHN WRIGHT	PIONEER	33Y18	130.0	19.7		\$247.77
	DOEBLER'S	75X2	121.2	25.6		\$216.78
	HOFFMAN	MAX607	121.9	23.0		\$224.22
MIDDLETOWN, MD FREDERICK COUNTY	PIONEER	33Y09	128.3	22.0		\$238.68
	DEKALB	DK626	112.3	18.8		\$216.06
	PIONEER	33Y09	125.1	19.1		\$239.95
PLANTED 4/23/98	HARVESTED 9/18/98					
ERIC SPATES	DYNA GRO	5566	109.5	21.2	56.0	\$205.49
	PIONEER	3140	122.5	19.2	56.0	\$234.83
	PIONEER	32K61	115.2	18.6	59.0	\$222.05
POOLESVILLE, MD MONTGOMERY COUNTY	DYNA GRO	5566	103.3	21.6	55.0	\$192.87
PLANTED 4/30/98	HARVESTED 9/22/98					

Adjusted Gross Income calculated with the price of corn at \$2.00 per bushel and drying costs of \$.02 per point of moisture. Yield is represented in bushels/acre at 15% moisture.

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