



## CONSIDER AIR-TO-AIR HEAT EXCHANGERS

Preheating incoming ventilation air offers the opportunity to reduce heating costs and can be accomplished by extracting heat from exhaust air through air-to-air heat exchangers, also called heat recovery ventilators (HRV). They transfer heat from exhaust air into incoming cold fresh air through exchanger plates. Heat removed from warm moist exhaust air by the exchanger is cooled and eventually reaches its dew point temperature, releasing heat and warming the incoming air. Production facilities can benefit from the use of heat exchangers as 90% of the total heat loss occurs through the minimum ventilation air exchange. Similarly, with the high cost of electrical energy, heat recovery might be a good alternative.

Heat exchangers will be most economical in nursery rooms and farrowing barns, due their higher temperatures, and drafts are a problem. While they can be expensive, energy savings should result in a 4 to 10 years payback in farrowing and nursery rooms. In Canada, heat exchangers may also be beneficial in grow-finish rooms and gestation rooms as some supplemental heat may be necessary in these facilities as well during the winter.

Heat exchangers replace minimum ventilation fans, as such should operate 24 hours a day, and should be manually controlled. It is essential that thermostatically controlled fans be on separate electrical circuits in the event of heat exchanger circuit failures. Heat exchangers require supplemental heat in certain situations, including cold weather and reduced barn capacity.

Producers should consider the advantages and disadvantages to this system and then decide whether it is right for their operation.



An air-to-air heat exchanger installed at Prairie Swine Centre

### HEAT EXCHANGER ADVANTAGES

- Less need to run heaters thanks to incoming air being pre-heated.
- Heat exchangers reduce frosting problems which can impede fan performance.
- Incoming ventilation air is preheated thereby reducing draft potential.
- Warmed inlet air won't drop as rapidly as cold inlet air from a conventional system.
- Ventilation rates can be increased when heat exchangers are used to improve air quality without an increase in heating energy costs.

### HEAT EXCHANGER DISADVANTAGES

- High initial purchase price.
- Not compatible with pit ventilation.
- Serviced or cleaned regularly to avoid clogging of exhaust air channels with moisture and dust, which restricts airflow.
- Since heat exchangers supply minimum ventilation, even a small reduction in air exchange affects the room's air quality.
- Clean heat exchangers on a daily, weekly, biweekly, or monthly schedule. Therefore, consider the ease and frequency of cleaning when selecting a heat exchanger.
- Due to the condensation happening inside the heat exchanger, there is a need to drain water from the unit and, during extreme cold temperatures, the need for a defrost cycle to remove frozen condensate.
- Older models have air discharged from a single point which limits room size unless more than one unit is used. If using a single heat exchanger, attach a distribution duct on the inlet side to provide adequate mixing of air within the ventilated room. This generally would be a rigid duct, either PVC or plywood, permanently attached to the heat exchanger with openings along the length for even distribution of air.