

Farm Mechanization FACTSHEET



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Hot Water Floor and Space Heating



HOT WATER FLOOR AND SPACE HEATING

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Hot water heating (sometimes called hydronic heating) is a popular and effective method of heating agricultural buildings. This plan gives design and installation guidelines for both floor and space heating systems.

Hot water can be used for a number of heating situations in farm structures, including:

- Space heating of livestock buildings, usually with black steel pipe, finned-tube convectors or hot water unit heaters. Hog, dairy and poultry buildings lend themselves well to this.
- Floor heating of shops, which may supply all of the heating needs.
- Localized floor heat in hog barns, such as in baby pig creeps, sleeping areas of finishing pens, etc.
- Heated-floor broiler chicken houses.
- Other specialized floor heating, such as in honey houses or processing rooms.
- Greenhouse heating, usually with finned-tube convectors or unit heaters to give the greater heating capacity these buildings require.

Hot water is the obvious choice for floor heating. In addition, hot water space heating offers several advantages for confinement livestock buildings:

- It is easy to heat several areas from one central boiler, with zone control of each.
- It is safer, because dust problems, clogged air filters, and the fire hazard of dust in air ducts and furnaces are eliminated.
- It is compatible with ventilation systems; desirable air flow patterns can be reinforced by correct location of the heating units, and furnace backdrafting due to ventilation fan suction is easily avoided by putting the boiler in a separate room.
- It is usually more efficient and has a lower operating cost than forced air.
- It is easy to clean and maintain.

The initial cost of a hot water system is often higher than that of other types, particularly when used for smaller one-room buildings. For large buildings with several heating zones, hot water is usually more economical. The system should be designed for each building, and alternatives evaluated to make an objective comparison.

HEATING SYSTEMS

The basic hot water heating system, as illustrated in Figure 1, consists of the following components:

- hot water heater or boiler;
- circulating pump;
- expansion tank;
- distribution piping;
- radiators in the space to be heated — black iron or steel pipe, finned-tube convectors, unit heaters or under-floor pipes;
- controls, valves, temperature and pressure gauges, air bleeding valve, pressure relief valve, and pressure regulator.

HEATING UNITS

Several types of heater can be used, ranging from a small residential heater to a large commercial boiler. Domestic hot water heaters will satisfy requirements up to 12 kW. They are cheap to install but are not likely to last as long as boilers. A circulating pump, expansion tank and controls must be added.

Commercial water boilers are recommended for larger systems. These are designed for high output and higher flow rates, and will probably give better long-term performance. The new high-efficiency "pulse-type" or condensing heaters are also suitable.

Coal or wood-fired water heaters are also available. Though less convenient, these may be more economical in some situations. Be sure that such boilers are fully equipped with safety and functional controls (see the section on controls).

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BRITISH COLUMBIA MINISTRY OF AGRICULTURE, FOOD AND FISHERIES

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