The Federal Environmental Protection Agency has become concerned about farmstead water systems where drugs or medication may be added to the drinking water for treatment of poultry or livestock. The big problem is the possibility of back siphon in the event of a pressure failure in the supply system. The Kentucky regulations on public and semi-public water supplies and the Plumbing Code prohibit cross connections.

A practical way to prevent back siphon is to let the water free fall at least 6" from the outlet of the supply line to the distribution system. This is sometimes called 'air gap' or 'vacuum break.'

The following diagram shows a system in which a pressure failure in the supply may result in the back siphoning of water from the drinking trough.

EXAMPLE I: NON-APPROVED SYSTEM
A well and pump system with a slow leaking foot valve and power outage loses water from the supply line. Due to the difference in height the water moves backward in the supply line into the well. Water is siphoned from the drinking trough because the outlet is below the surface. If medication is added to the trough it could wind up in the well. When the pump starts again the polluted water could enter the home supply line.

EXAMPLE II: NON-APPROVED SYSTEM

The above sketch shows another way the main water supply may be contaminated by backflow of water from a watering trough or a wash down hose. As the water flows from A to B past the tee fitting at C it is possible that a partial vacuum may form at C. This vacuum will cause contaminated water to flow towards the main supply line from D and E. With the valves at F and G completely closed this may be prevented; however, there is the possibility they are not completely closed. Disconnection of the hose at the faucet at F after each use and the provision of 6" air gap above the edge of the tank between G and E is the best way to prevent backflow to the main water supply line.

Hose connections on the supply line as shown in the diagram will not be approved.

The diagrams that follow show ways that approved systems may be installed or existing systems modified. After installation or modification have the system inspected by the local health department.
This diagram is an example of one way to install the air gap. It could serve all water troughs in a poultry house, which is the reason for calling it a central system. A storage tank can be located above the level of the watering troughs. This may be on the ceiling joists if they are strong enough. Water falls from the outlet of the supply line into the storage tank. Chemicals or drugs can be added at the tank in correct proportions.

If, for some reason, a loss of pressure results in backflow in the supply line, nothing but air can enter. The supply line cannot siphon water from the storage tank because of the air gap.

The six inch distance must be allowed above the edge of the tank and the end of the outlet pipe; it should not be measured from the float-controlled water level line. This is necessary because of the possibility of failure of the float control to limit the water level, thus submerging the outlet.

The example shown here illustrates the same principle as the central system except that the tank is smaller. This tank and float furnish the drinking water for only one plastic line feeding several cups or nipples.
There is a 6" air gap between the end of the outlet pipe and the upper edge of the tank. Medication or drugs are added in the tank, and the drinking water from the tank is prevented from being siphoned back into the supply line if a back flow ever results in the supply line.

**TANK AND TROUGH:**

![Diagram of Tank and Trough](image)

This example is very similar to the preceding one. The difference is that a trough is used instead of pipe. The level of drinking water maintained in the trough extends back into the float box.

The 6" air gap in this case is maintained between the end of the supply line and the top edge of the trough. In case of a failure of the float-controlled valve to stop the supply line flow, the water level can never be higher than the edge of the trough.

**CONTINUOUS FLOW:**

![Diagram of Continuous Flow](image)

In this example a method is shown that is popular with many poultry producers. A continuous flow of water is maintained in the trough. The trough must have only a slight slope so that the same level of drinking water exists for the entire length. The depth of the water is controlled by the amount of flow allowed from the supply line. This is controlled by the operator adjusting the valve in the supply line. There is a drain at the low end of the trough taking excess water away.

The 6" air gap is between the end of the outlet pipe and the edge of the trough. This prevents water in the trough from being siphoned back into the supply line.

It is recommended that non-threaded outlets be used to discourage the attachment of pipes or hoses to these fittings which could lead accidentally to contact between the outlet and the drinking water in the trough.