

Reducing Wastewater from a Swine Operation

Reducing wastewater from a swine operation can save time and money and create a healthier living environment for swine. Here are six areas where wastewater reduction can have a positive impact on the farm.

Using less water

Use as little wash-down water as possible. This reduces the amount of wastewater that must be stored, disposed and utilized. To measure the amount of water that a farm uses to wash down the pens, you will need a watch with a second hand and a bucket of a known volume (e.g., 19 liters or 5 gallons). It is important that you do everything just as in a normal wash-down. Use the same nozzle and get the hose flowing at the usual rate. Then, measure how long it takes for the bucket to fill.

For example: you wash down for 60 minutes, every day except Sunday. To calculate the amount of water used, record the time it takes to fill a 19 liter (5 gallon) bucket. If it takes 2 minutes to fill it, the amount of water used is 19 liters / 2 minutes = 9½ liters per minute (5 gallons / 2 minutes = 2½ gallons per minute, or 2½ gpm). Here are some numbers to consider:

- Every day, you use 60 minutes x 9½ liters per minute = 570 liters of fresh water (60 minutes x 2½ gallons per minute = 150 gallons of fresh water).
- Every week, you use 6 days x 570 liters per day = 3,420 liters (6 days x 150 gallons per day = 900 gallons).

To reduce the amount of washwater, try different nozzles. A smaller opening will have less flow and faster velocity.

Woven wire floors and farrowing crates

When you install woven wire floors and farrowing and/or nursery crates over a concrete surface, the benefits include the following:

- Solids can be scraped from underneath the wire with a hoe without moving the pigs.
- Crates can reduce disease, especially scours.
- Small pigs are cleaner and drier.
- Wire floors can reduce water use because daily washings are not needed.

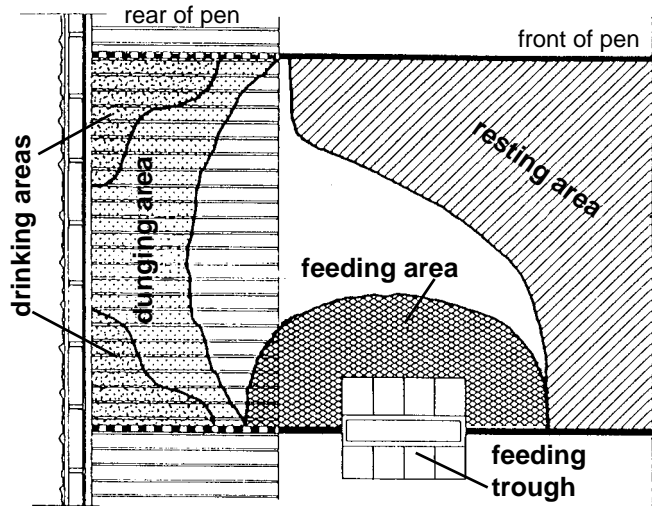
More information on woven wire floors is available in ADAP fact sheet 2003-6 on *New Construction Ideas for Healthier Pigs-Farrowing and Nursery*.

Designated dunging area

Encourage swine to use one corner or end of a pen as a dunging area rather than excreting wastes anywhere in the pen. By doing so, you will only need to wash this corner of the pen on a regular basis. To encourage pigs to dung in the designated area, you can incorporate the following practical methods:

- Slope the pen floor approximately 2½ cm drop on a 3 m run (1 inch / 8–10 ft) to allow liquid waste to flow easily to the dunging area.
- Make group pens at least 1.8 m (6 ft) wide to assure sleeping pigs don't block access to the dunging area.
- Design feeding and watering troughs to slope toward the dunging area.
- Locate wall-mounted drinking water pans or waterers in the dunging area of the pen.

- Use pens that allow air flow (such as pipe walls or concrete blocks with holes) around the dunging area.



Dunging area at back of pen allows for easier cleaning

VIDO Swine Technical Group. Farrowing Barn Design and Management Bulletin: Number 1. Veterinary Infectious Disease Organization (VIDO). 1986.

Watering systems

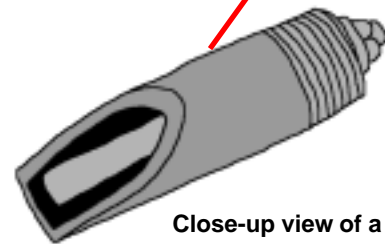
Water nipples or automatic watering bowls may be used to reduce water usage. Benefits include the following:

- Water is available 24 hours daily.
- Troughs cannot be tipped over and spilled.
- Water is cleaner.
- Feed intake and growth rate are improved.
- Sows produce more milk.

Water is often neglected as a critical part of the pig's survival and must be supplied in unlimited amounts for optimal growth and performance. Even with free access to automatic watering devices, make sure low flow rates do not restrict water pig's need.



Water nipples provide a constant water supply with no mess.



Close-up view of a water nipple

Keep rainwater out: install eaves

Keep rainwater away from animal pens and manure handling systems by putting eaves on pen roofs. Rainwater in the Pacific is very clean and can be used for drinking water depending on the catchment system. Without enough roof area, however, several things can go wrong.

- Rain falling into the dunging area increases the wastewater volume.
- Rain falling into the feeding area reduces the feed quality and can wash away valuable prepared feed.



Extend eaves beyond the back wall to keep rain water out of waste trough.

Keep rainwater out: install berms

Building up berms around a piggery and waste collection area helps to:

- Keep rainwater runoff and seepage clean so it can flow to streams.
- Reduce the amount of water getting into the waste system.
- Protect pigs in the event of a storm.

For additional resources and publications, refer to ADAP fact sheet 2003-11 on *Additional Information for Swine Waste Management*.

This series of fact sheets was developed by: Halina M. Zaleski* (University of Hawaii-UHM), Manuel Duguies (University of Guam), Engly Ioanis (College of Micronesia-FSM), Gordon Cleveland (formerly with UHM), Daniel Paquin (UHM), Bradley LeaMaster (formerly with UHM), Luisa Castro** (UHM), and James Hollyer (UHM).

* Send correspondence to 1955 East-West Road, Agricultural Science 216, College of Tropical Agriculture and Human Resources, University of Hawaii at Manoa, Honolulu, Hawaii USA 96822.

** Provided content research and technical editing. Thanks to Kristie Tsuda for her work in the assembly and layout of earlier versions of this work and to Dale Evans for editing. Thanks also to Shirley Nakamura and James Lum of Natural Resources Conservation Service-Hawaii for their helpful advice.

Disclaimer: The information contained on this publication is to be used at your own risk. As always, follow your local regulations.

For Further Information:

American Samoa Community College (684) 699-1575 - fax (684) 699-5011
 College of Micronesia (691) 320-2728 - fax (691) 320-2726
 College of Micronesia (FSM) (691) 320-8181 - fax (691) 320-2972
 College of the Marshall Islands (692) 625-3236 - fax (692) 625-4699
 Palau Community College (680) 488-2746 - fax (680) 488-3307
 Northern Marianas College (670) 234-3690 - fax (670) 234-0054
 University of Guam (671) 735-2002 - fax (671) 734-6842
 University of Hawaii (808) 956-8140 - fax (808) 956-6967

Funded by the United States Department of Agriculture Cooperative State Research, Education and Extension Service Grant 99-38826-7854
 ADAP Home Office - College of Tropical Agriculture and Human Resources
 3050 Maile Way, Gilmore Hall 112, University of Hawaii at Manoa
 Honolulu, HI 96822 USA www.adap.hawaii.edu/adap - adap@hawaii.edu
 The Pacific Land Grants and the U.S.D.A. are Equal Opportunity/Affirmative Action Institutions.

