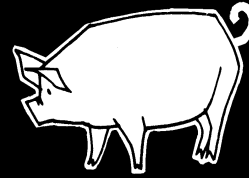




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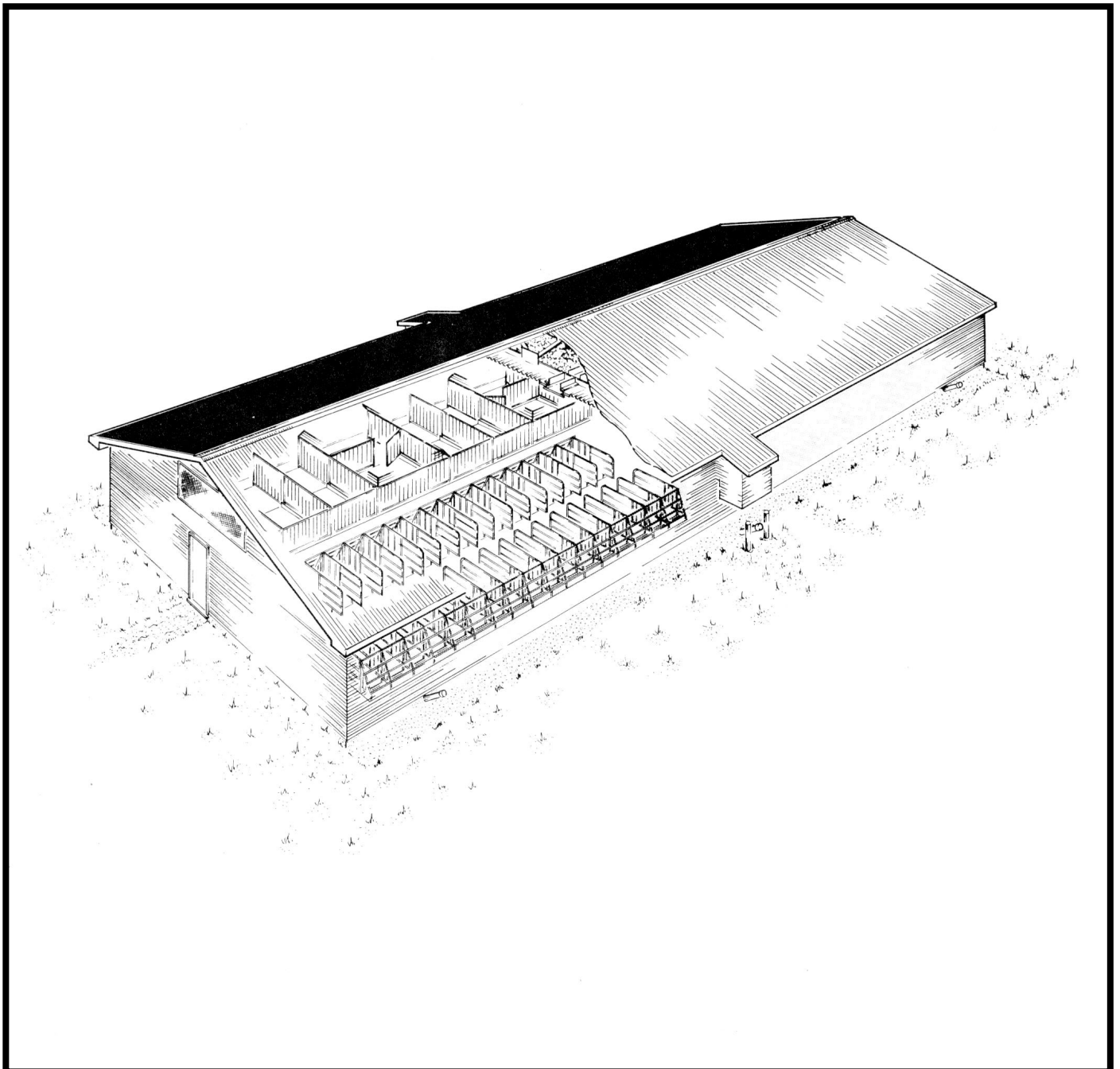
Agricultural Building Systems Handbook



PLAN

362-21

BREEDING - GESTATION UNIT, PEN STALLS AND GROUP PENS



DEVELOPED BY CANADA PLAN SERVICE

BREEDING-GESTATION UNIT, PEN STALLS AND GROUP PENS

CPS

PLAN 3236 NEW 84:04

This plan set gives details of a swine breeding-gestation unit suitable for the 'nominal' 100-sow herd. The plan is intended to be coupled with other components of a swine housing system, having the same 10.8 m clear span construction as other CPS units such as (Plan 362-51) Grower-Finisher Unit. Full housing capacity is 68 dry sows in individual pen stalls (Plan 362-61), 32 gilts or sows in group pens (8 pens x 4/pen), and 5 boars. This makes a total capacity of 105 breeder pigs, not counting 20 to 30 sows in farrowing housing at any given time.

The building length (and the corresponding numbers of group pens and pen stalls) could be adjusted to accommodate more or fewer breeder pigs, with appropriate adjustments to ventilation and manure-handling systems as well.

PEN STALLS Gestation pen stalls eliminate fighting and competition between sows, ensuring that the boss sows don't get too fat or injure the more timid sows. Limit-feeding the dry sow herd thus becomes a practical possibility, controlling overweight sows and dramatically improving the number of piglets weaned from each sow.

The pen stalls can be one of several types shown in Plan 362-61. Most of these pen stalls are made 600 mm wide, with 12 stalls made 650 mm wide for the comfort of some bigger-than-average sows.

Two arrangements of the pen stalls are possible (face-out or face-in). The face-out stall rows shown in the plan share a common slotted-floor manure gutter at the rear of the stalls. If you prefer face-in stall rows, they share a single raised feed alley between rows, and could have cantilever slotted floors at the rear of the stalls. Both arrangements have their advantages; better face-to-face communication between sows is claimed for face-in, whereas with face-out the manure collecting system tends to be simpler to build and easier to maintain clean. With cantilever slotted-floors and face-in stalls, the building span should be increased to 11.1 or 11.4 m overall.

FEEDING Sows in pen stalls are usually fed in a continuous concrete feed trough shared by a row of stalls. Or, each stall can be provided with its own steel hopper (a less-popular alternative, available from stall hardware manufacturers). Sows in stalls are usually individually hand-fed, using a calibrated or weighing

feed scoop to dip from a rubber-tired feed cart. Automatic feed-dispensing equipment is commercially available for the very large producers, but most good herdsmen in Canada seem to prefer the forced opportunity to check on each sow individually at feeding-time. With either feed auger or cart feeding there is much less squealing and stress if all sows can be fed at the same moment. This can be done with feed hoppers over each feeder, all dumped simultaneously by a single cable-release.

WATERING Sows in pen stalls may be watered by providing a drinker nozzle for each sow, centered over the steel feed hopper to catch the dribbles. With the continuous concrete feed trough, a less expensive alternative is to run a water line of galvanized steel pipe along the stall fronts. A hole, drilled in the bottom of this pipe at each stall, trickles water into the feed trough whenever the supply tap is opened. Each drop pipe and supply tap can serve a row of up to 20 stalls where the drop pipe is located mid-length in the row.

Where the stall fronts are used as exit gates, this water line must of course be raised to clear the sow's back; one alternate location is the foremost top pipe of the stall row. With this, a pipe (with valve) is dropped to the midpoint of each 10 stalls, and the valves are 'balanced' to supply enough water to all stall groups whenever a main supply valve is opened. Once the balancing valves are adjusted, remove the handles to prevent tampering.

GROUP PENS Gilts frequently do not adapt happily to the confinement of an individual pen stall, so they are housed in a row of 1.5 x 3.9 m group pens (pen capacity 4 sows, or 4 to 5 gilts) along one side of the barn. These pens are paired and alternated with single boar pens to provide maximum breeding stimulation.

Remember that the older boars tend to produce greater amounts of stimulating pheromones (sex odors), so the older boars should (if possible) be housed in pens alternating with young boars along the barn. Each 2.4 x 1.5 m boar pen is located over the slotted floor, and combined with a breeding pen 2.4 m square in front. Swine breeders have learned the wisdom of providing a breeding pen with suitable non-slip flooring. One choice is rough-textured concrete sloping slightly for drainage to the slotted floor area in the boar pen. Another choice is a flat clay floor, separated from the slotted-floor boar pen by a steel

fence partition bedded in a concrete curb at the bottom.

Sows and gilts at breeding stage are often unsettled and cantankerous, and the group pen floors are usually messy. Under these conditions floor feeding is not too practical, so feed hoppers are frequently hung on the front access gates or clamped to the pen partitions, near the front gates. Pairs of nozzle drinkers or water bowls are clamped to the pen partition over the slotted floor to provide drinking water to pairs of boar or gilt pens.

VENTILATION AND HEATING Fresh air for ventilation may be supplied directly from outside (with side air inlets, plan 305-15), or from the attic (with center air inlets, plan 305-11). In either case, precisely-adjustable baffles of rigid polystyrene foam board are easily controlled from one convenient point by a boat winch and cable system. This feature is most important to handle the wide range of slot openings required from summer maximum (40 mm) to winter minimum (1.4 mm, estimated).

A system of exhaust fans power the ventilation; these are step-controlled by a group of four thermostats, all mounted on a board suspended at eye-level in the center of the room. The smallest, continuous-running 2-speed fan is located to draw air from the manure gutter in the group pen area, an idea that provides some benefit to pens located closest to the exhaust fan. The outside hood on this same fan can be adjusted to push part of the warm exhaust air down into the pipe leading to long-term manure storage, to prevent freezing in the pipe.

In extremely cold weather (below -18°C) some supplementary heating will be required to prevent excessive dampness. This heating should be electrically interlocked with the Step 2 ventilation so that heating is **ON** only when Step 2 ventilation is switched **OFF**.

In summer, continuous eave flap doors and big gable end doors are opened to the attic, increasing natural ventilation in the attic and minimizing its temperature rise.

LIGHTING Good lighting extended to about 14 h each day also helps stimulate estrus behavior in the unbred sows and gilts. A time-clock wired to control the lighting circuits is better than relying on the herdsman to always remember to switch the lights on and off. A

clean white or near-white finish on walls and ceilings is more important than the number and wattage of lights used. Recommended light intensity is about 80 lux (7.5 foot candles), measured in the center passage and in the group pen area.

MANURE SYSTEMS This plan shows slotted floors and a liquid manure system designed to minimize the manure storage time inside the barn. The pen-stall area can use one of several alternatives for manure removal. The **face-out stall arrangement** shows a **concrete slotted floor** area between the stall rows, with a shallow stop-and-flow gutter system under the slotted floor. The gutters collect liquid manure for up to a week, then plug valves made from matched plastic pails are pulled open, flushing the accumulated liquid manure into a sewer pipe leading to long-term storage outside. This is the simplest possible liquid manure removal system, but must be carefully watched to make sure that settled manure solids do not accumulate. Vacuum-tanker pipe connections are provided (at the dead ends of the gutters farthest from the outlet) for emergency flushing in case the gutters accumulate solids.

Another idea to improve flushing action in the paired gutter at the pen-stall area is to open alternate valves at each flushing. This reverses the direction of flow with each flush.

Another system (shown in Plan 362-61, but not in this plan) shows stalls with a **cantilever slotted floor** at the rear of each stall row. This arrangement of elevated slotted floors allows for daily manure cleaning, using a special pusher-blade pivoted on an offset pipe-handle (see Plan 362-61). With this, manure is pushed into a small concrete sump under the center alley. Manure is flushed from this sump by pulling open a plug-valve connecting to the sewer pipe. This manual cleaning system takes a little more time, but it minimizes odor from accumulated manure in the barn, and is very reliable.

In the group pen area, concrete slotted floors are located over a shallow stop-and-flow gutter at the rear of the pens. Here too, the idea is to minimize in-barn manure storage time to reduce odors. This system depends on having a long-term, manure-tight liquid manure storage separate from the barn. A storage big enough to handle at least 6 months of manure production (9 months is better) allows you to avoid spreading manure in winter when the ground is frozen or in summer when crops are growing.