

Lauren Christian Swine Research and Demonstration Farm: An Update

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Background

In December 1995, the Walnut Grove Research Farm near Atlantic was donated by Cargill, Inc., to the Wallace Foundation for Rural Research and Development, a grassroots organization in southwestern Iowa interested in agriculture. The Wallace Foundation and Iowa State University (ISU) agreed to develop the farm for swine research and demonstration activities. The farm was named the Southwest Swine Research and Demonstration Farm. The donation included 70 acres of land, several livestock buildings, three silos, a residence, farm equipment, and the swine breeding stock. The existing swine breeding herd was sold. The farm is operated in conjunction with the Armstrong Research and Demonstration Farm, which is about 7 miles west. On September 17, 1998, the farm was renamed the Lauren Christian Swine Research and Demonstration Farm in honor of Lauren L. Christian, a distinguished professor in the ISU Animal Science Department. Christian is a well-known swine geneticist who has helped many Iowa pork producers for over 30 years.

Mission and Objectives

The Wallace Foundation, the Iowa Pork Industry Center, and ISU staff interested in swine developed plans for the farm. The mission statement for the farm is as follows:

The Lauren Christian Research and Demonstration Swine Farm is a place where people can see, learn, and practice modern pork production systems. The farm is a site for instruction and research in swine management that helps position Iowa to have competitive and sustainable pork production systems.

The objectives of the farm are to:

- Evaluate and demonstrate innovative pork production techniques for Iowa producers.

- Teach ISU and community college students, as well as, pork producers and pork agricultural business people, modern pork production skills.
- Acquaint individuals not associated with the pork industry about modern pork production.

Plans

Because of trends in the swine industry for multisite production and segregated rearing, the farm was developed as a breed-to-wean operation (i.e., breeding, gestating, and farrowing of sows is emphasized). The pigs are weaned at approximately 18 days of age. Pig nursery buildings will be located on the farm but separated from the sow buildings. Three herds of approximately 135–150 sows each are housed in different gestation housing systems. The three gestation housing systems are (1) confinement with individual sow crates and environmental control, (2) partial slat confinement with group pens and curtain-sided, and (3) bedded hoop structures with group pens. The sows housed in group pens (confinement and hoops) are fed individually. Individual feeding is accomplished using individual feeding stalls or electronic, computerized sow feeders. Farrowing will occur weekly. There are four farrowing rooms each with space for 16 or 18 sows. Half the farrowing spaces are farrowing crates and half are farrowing pens.

Developments

Major construction and renovation occurred at the farm during 1996 and 1997. Activities included:

- Demolishing old concrete cattle lots and unusable buildings.
- Remodeling the feed building into a farm shop.
- Planting a windbreak and installing a farm sign.
- Pumping and closing two earthen manure-storage lagoons.
- Constructing a 500,000-gallon concrete manure storage tank.
- Remodeling the grower barn into a centralized breeding unit with crates and pens. This project included removal of 18 inches of sludge and installation of a manure scraper in the pit.
- Installing a new water system, manure transfer system, ventilation systems, and feeding systems.

- Converting the two nursery rooms into farrowing rooms.
- Converting the open-front partially slatted finishing unit to a confinement gestation unit with pens. Half of the sows are fed in individual feeding stalls and half are fed with an electronic feeder. Sixty-five sows are housed in each half of the unit.
- Constructing two 30 ft × 108 ft hoop structures for gestating sows. Each hoop contains 65 sows. One hoop has individual feeding stalls. The other hoop has an electronic feeder.
- Stocking the farm with purebred terminal Duroc boars and maternal-line gilts. Half the gilts are Yorkshire-Landrace cross and the remaining gilts are 1/4 Hampshire and 3/4 Yorkshire and Landrace cross.
- All facilities are equipped with signage and viewing areas to accommodate visitors.

Two Major Comparisons

One major comparison at the farm is the three gestation housing systems. The sows are moved to the breeding barn from the farrowing rooms at weaning. Currently, all matings are hand-mated. Artificial insemination is planned in the future. Sows are moved to the gestation housing system 3–8 days post-breeding. Each sow returns to the same gestation system throughout her reproductive life. Sow weight and backfat measurements are taken at weaning and when the sows are moved to the gestation housing. Reproductive performance and behavior of the sows is monitored for each system. The three gestation housing systems are (1) confinement with individual sow crates and environmental control, (2) partial slat confinement with group pens and curtain-sided, and (3) bedded hoop structures with group pens.

The second major comparison is the four manure storage and handling systems. (1) The crated gestation unit has a partially slatted floor with flush gutters. Recycled water from an outside aerobic storage tank is used to flush. The tank is aerated with a floating pump/aerator. (2) A deep pit is under the group gestation unit. (3) The breeding barn has total slats with a shallow pit and scraper. All farrowing rooms have raised decks with pans and augers. Manure from the farrowing rooms and breeding unit is transferred to the large anaerobic storage tank. (4) The hoop buildings are bedded with large round bales of cornstalks and generate solid manure. The solid manure is composted.

Additional studies and comparisons will be conducted at the farm, including sow environment

documentation, flooring and feeder evaluations, farrowing crate vs. pen comparisons, floating manure tank covers, manure nutrient tests, sow genetic line comparisons, manure odor evaluations, and others. The farm also will be the site of hands-on workshops in swine technologies.

Staff

Currently, the farm has three full-time staff members and several part-time employees. The staff works closely with the ISU Armstrong Research and Demonstration Farm staff about 7 miles away.

Production

Weekly farrowing started May 1998. The first groups of pigs weaned were transported to the ISU Rhodes Farm and finished as part of a research project. Growth rates were excellent. The pigs will be marketed in October and November 1998.

Future Plans

Future plans call for adding pig nurseries with viewing rooms. The nurseries will be built south of the sow units and at some distance to achieve multisite health advantages. Pigs will be reared from weaning (12 lb) to feeder pig size (40 lb). Also a headquarters building is planned with offices, classroom, restrooms, showers, and breakroom.

Conclusions

The ISU Lauren Christian Swine Research and Demonstration Farm represents a promising combination of local ownership and input, university and extension leadership, community college participation, research projects, hands-on outreach programs, and student internships. As the swine industry changes, the Christian Farm will be active in assisting pork producers learn and explore applied technologies to help them be competitive and sustainable.