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Swine Teaching and Research Center Partners With Swiss Village Farm

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The world’s population, currently a staggering 7.1 billion, is estimated to reach 10.5 billion by 2050. Why should we care? Hasn’t the world’s population been steadily increasing since the Great Famine and the decimations of the Black Death in the 14th Century? Indeed it has, and since the end of World War II, that growth rate has been phenomenal. Elsewhere in the world, populations continue to grow, and burgeoning middle classes in countries like China and India, as well as the African continent, are using their new found wealth to change their dietary habits, consuming more animal protein than ever. Thus, concerns voiced by experts such as the United Nation’s Food and Agriculture Organization that the world may not be able to meet its demands for meat, milk and eggs in coming years are well founded.
What does that have to do with veterinary medicine? A lot, actually. The veterinary profession is critical to animal agriculture. Modern western production methods have led to a significant diminution in the variety of animal breeds being raised for consumption. According to the National Pork Board, in the US alone, there are only eight major swine breeds in the pork production pipeline. Pork accounts for 40 percent of the protein consumed worldwide, so veterinary oversight of pork production is crucial to ensure a safe, high-quality meat, especially since pigs are raised in high volume (between 100 and 120 million each year in the US alone) and in close quarters on most large scale farms.

This reduction in the variety of breeds being raised is problematic, as it reduces genetic variability and our herds’ ability to adapt to change and makes the food supply vulnerable to catastrophic pandemics. Part of the research being done at Penn Vet’s Swine Teaching and Research Center addresses what behavioral traits may be advantageous for the future and which breeds are the repository of these critical traits.

This is where a very special and unique collaboration comes into play. Since 2010, Penn Vet has been working with the SVF Foundation at Swiss Village Farm in Rhode Island. The Foundation was established in 2000 by Mrs. Dorrance Hamilton, and its mission is “to preserve genetic material from rare and endangered breeds that could be used to respond to any future catastrophic loss of animal populations and also restore the loss of variety in species that contribute to current food animal vulnerabilities.” Until the Foundation’s involvement with Penn Vet, its principal focus had been on cattle, goats and sheep.

Mrs. Hamilton’s vision to preserve rare breeds is compelling and shows her keen understanding of the dangers of lack of diversity in the food animal population. For example, according to the Holstein Association USA, the Holstein accounts for almost all dairy cows in the US as nine out of ten dairy farmers milk Holsteins. The breed is renowned for its superior milk production, genetic merit and adaptability to a wide range of environmental conditions. But what if a catastrophic new disease decimated the Holstein population? As the dominant dairy breed in this country, the effect would be devastating both for the dairy industry and the consumer. The same is true for swine, given the relatively limited genetic pool with which pig farmers currently work.

The collaboration between the SVF Foundation and Penn Vet's Swine Teaching and Research Center is therefore tremendously important to both organizations’ work. Dubbed “on-hoof conservation,” Sarah Bowley of SVF has been locating rare or heritage breed swine for study by Dr. Tom Parsons and his colleagues at the Swine Center’s Behavioral Unit. Pregnant mother sows are transported from breeders across the country to the Widener Large Animal Clinic at Penn Vet’s New Bolton Center. To prevent the introduction of unwanted diseases to New Bolton’s swine herd, an elective Caesarian section is performed by the department of surgery to aseptically remove the piglets from their mothers. The piglets are then transferred to the Swine Center and adopted by awaiting surrogate mothers from the existing herd. These animals will be raised and bred in the Swine Center to build a bio-secure founder population of rare breed animals.

For nearly 40 years, commercial sows have been selected to perform in the predominant type of sow housing called the gestation stall. Growing consumer concern about the stall has resulted in over 50 nationally branded food companies promising to remove gestation stalls from their supply chains during the next decade (see side bar). The heritage breed animals have not been subjected to the same intensive selection pressure as their commercial counterparts,
The following companies have committed to eliminating gestation stalls from their supply over the next decade. Several of these companies have visited the Swine Teaching and Research Center to learn more about the challenges and solutions that their suppliers will face during this transition.

Applebee’s and IHOP (owned by DineEquity)
ARAMARK
Arby’s
Atlantic Premium Brands
Au Bon Pain
Bob Evans
Bon Appétit Management Company
Bruegger’s Bagels
Burger King
Campbell Soup Co.
Carnival Cruise Lines
CKE Restaurants, owner of the Carl’s Jr. and Hardee’s chains
Compass Group
ConAgra Foods
Co-op Atlantic
Costco
Costco Canada
Cracker Barrel
Denny’s
Dunkin’ Brands
Einstein Noah Restaurant Group, owner of Einstein Bros. Bagels, Noah’s New York Bagels, and Manhattan Bagels
Federated Co-operatives
Fresh Enterprises
General Mills
Harris Teeter Supermarkets

The longer-term goals for heritage breed animals would be to collect semen, embryos, and stem cell progenitors to be archived with the other genetic material SVF has been preserving. New Bolton Center also plans to become a source of rare breed animals for pig breeders and restaurateurs alike. Finally, the New Bolton Center work will help existing heritage breeders increase genetic diversity in their current herds through reproductive technologies associated with semen collection, handling and artificial insemination – all the expertise of Dr. Gary Althouse, Chair of New Bolton Center’s Clinical Studies and an expert in this field.

Penn Vet and its extraordinarily gifted researchers are constantly working to answer questions that are crucial to everyone’s future. One of the most critical outcomes of this collaboration is the opportunity to work on joint education efforts to share information on the importance of bio-diversity relative to food security.

Dr. Parsons’ partnership with the SVF Foundation to proactively work towards preserving rare breeds and to identify traits that might make them relevant to farms of the future is just one significant example of the School’s leadership role in areas that affect each and every one of us.

Piglets nurse from their foster mother.

and thus, the Swine Unit’s immediate goal is to see if heritage breed animals can provide behavioral traits lost from commercial animals that might be helpful in the stall-free housing systems of the future. If so, then the heritage breeds could become more mainstream and no longer be at risk of progressing from rare to endangered.

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