



The Ceiling's the Limit in Barn Repair Options

By Geoff Geddes, for Swine Innovation Porc

Barns and bodies have something in common: They both deteriorate, and the results are rarely pretty. For pork producers, barns are one of their biggest assets, but they can quickly become a liability. Since trading in your barn every ten years for a new one isn't an option, producers need practical solutions, and researchers are anxious to provide them.

"Some years ago, a pork producer with multiple barns in their system approached us for help in addressing the rapid deterioration of various structural components that they observed in

their barns," said Dr. Bernardo Predicala, Research Scientist – Engineering at the Prairie Swine Centre.

Barn Makeover

"They found that barn components such as walls, cladding and trusses, which were normally expected to last at least 15-20 years, needed major repairs or replacement in 5-7 years. That meant this particular producer was spending more than \$2 million every year within their system on repair and replacement costs for these components."

Based on that information, researchers did some preliminary digging to determine the extent of the problem across the industry.

Even barns hate winter

"Swine building environments, especially during harsh Canadian winters, are often very destructive to barn infrastructure like walls, eaves, ceilings and attics. Varying thermal conditions, high levels of moisture and corrosive gases such as hydrogen sulfide and ammonia, and the presence of dust and microorganisms causing decay are all possible destructive factors that make swine barns highly susceptible to accelerated deterioration."

Not surprisingly, then, producers are looking for ways to address these issues to extend the life of their barns and avoid doing costly renovations every few years to keep the barns in operation. Finding this a common problem, researchers conducted a literature review and an information survey to identify strategies for addressing the rapid decline of many Canadian pig barns.



Swine barns.
Photos: Prairie Swine Centre



Photo: Prairie Swine Centre

Solution focused

Working with collaborators in Quebec, the first task was to perform a comprehensive review of various scientific and industry publications from universities, research institutions and other online resources in North America, Europe, Asia and Australia. Rather than narrowing their focus, they took a broad approach in exploring solutions not only pertaining to livestock buildings, but including those developed for other related industries as well.

Their next step was an information survey conducted in both English and French. They made direct contact with swine producers, farm building contractors, equipment and material suppliers, and other industry stakeholders to gather information on novel building construction techniques and materials (no pigs were available for comment at this time).

Concrete results

“While we confirmed that wood, concrete and steel (metal) are the most commonly used materials in agricultural building structures, we learned that degradation of wood structures is mainly caused by either biotic agents like bacte-

ria and insects or external factors including solar radiation, precipitation, changes in relative humidity and temperature.”

As hard as the environment is on barns, humans also play a part through activities such as applying chemicals for cleaning, sanding and power washing, among others.

Using the information they gathered on common materials and their respective causes of rapid deterioration, researchers plan to generate options for addressing the issues.

By providing a list of possible solutions to barn decline, Dr. Predicala and his collaborators hope they can help producers extend the useful life of their barns and avoid costly, recurring renovations. Time and money permitting, the next step will be selecting the most promising solutions and conducting actual in-barn evaluations to determine their feasibility.

Of course, research can't fix those harsh Canadian winters that contribute to barn decline (at least not yet). In the meantime, though, studies like this can help mitigate the effects on your barn and, ultimately, on your business. 🐷

For more information....

To learn more about the work described in this article, please contact Dr. Bernardo Predicala at bernardo.predicala@usask.ca.

You may find additional resources related to the project *Investigation of strategies to mitigate accelerated deterioration of pig buildings* by consulting our website:

swineinnovationporc.ca/buildings-and-environment

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