



Pork Belly Technology that's Made to Measure

By Geoff Geddes, for Swine Innovation Porc

If you've ever seen a "work of art" that looked like a paint can exploded, yet it sold for a million dollars, you know that measuring quality is a tricky thing. That's especially true in the pork industry, where in spite of pork belly prices rising over the last few years due to high consumer demand, belly quality is still measured using subjective and time-consuming manual methods. As it turns out, it may be a hard problem with a soft solution.

"Based on years of research and the latest findings in pork belly softness, we sought to develop an instrument that could lead to an automated system for belly classification," said Dr. Bethany Uttaro, Research Scientist, Meat Quality - Applied Bioinstrumentation with Agriculture and Agri-Food Canada (AAFC).

The current approach in the plant is for staff to pick up the ribless or rib-free belly and assess its firmness or softness. If that can be changed to an objective method, it would save wear and tear on the people lifting those bellies repeatedly, reduce mistakes and possibly save on labour costs.

Two minutes is too long

Prior to this project, research on alternative approaches involved testing belly firmness by bending it over a bar, skin-side down, letting it drop for two minutes and then measuring how much it dropped. While this may have worked as a research tool, it was impractical for a plant environment because, as Uttaro put it, "you don't have two minutes to figure things out".

As is often the case in research, the road to a solution began with a simple statement: There has to



Assessing pork belly quality. Photo: AAFC

be a better way. Thus began a series of tests by Uttaro and her team - using cameras and a short conveyor that could be adjusted to different angles - to determine the optimal angle for the plant conveyor belt.

“It came down to a combination of the ability to manage the belly on the conveyor and what the bend was telling us about firmness of the fat and lean.”

Another common theme for research is that answers often come when you least expect them, and this project was no exception.

Let the bellies fall where they may

“I was presenting our findings at a project meeting and someone said maybe we should just use the bar at the end of the belt for sorting bellies. The really soft ones would fall between the end of the conveyor and the bar, while the firm ones would go over the bar. Instead of employing cameras and electric eyes, why don't we just use gravity?”

Following this “a-ha” moment (or what Uttaro called her “duh” moment), researchers had the existing equipment modified so it would lie flat. This allowed them to evaluate its potential use for classifying pork rib-in bellies based on objective softness traits. Different settings for accuracy and speed were tested using 400 bellies from commercial pigs, and another 450-500 bellies will be used to test the accuracy of the prototype.

“With this new system, firm bellies will traverse the gap between two conveyors to go for further sorting. Meanwhile, the soft ones will drop to a third conveyor below and be taken off there.”

No separation anxiety

In this way, the plant can easily separate bellies that are unsuitable for bacon production and send them elsewhere. Those deemed “bacon worthy” can be further sorted for their fit with certain markets.

Preliminary tests have shown potential for the development of an automated commercial system.

“It would be very useful for the plant to be able to sort bellies early on, consistently and with little effort, freeing up another person further down the line. If there are some bellies that are suitable for the Japanese market and thus more valuable to the plant, they can be pulled out of the line as they must be ribbed differently than those bound for North American markets.”

If all goes well, perhaps a future project could examine why people spend millions of dollars for “exploding paint can art”. Then again, some things just defy explanation. 🤖

For more information....

For more information about the work described in this article, please contact Dr. Bethany Uttaro at bethany.uttaro@canada.ca.

This research was part a larger national project titled *Use of novel technologies to optimize pig performance, welfare and carcass value*.

You may find additional resources related to the project by consulting our website:

www.swineinnovationporc.ca

The work presented in this article was part of Swine Innovation Porc's Swine Cluster 2: Driving Results Through Innovation research program. Funding was provided by Agriculture and Agri-Food Canada's AgriInnovation Program, provincial producer organizations and industry partners.