



Tina Sørensen

**2. Deep litter:** Using a bale opener and a straw chopper drum, the system distributes straw in deep litter stables, saving labour and up to 30 per cent of straw usage while making the animals more comfortable.

**3. Floor feeding:** The system provides maize silage, soybeans or minerals through a vertical mixer. The automatic distribution aids in saturation, which reduces sow stress, as well as enrichment.

**4. Combination:** If the goal is automatic floor feeding as well as straw distribution, it can be accomplished by means of a robot, feed mixer, minerals, straw, silage and multiple filling stations.

## II. JH Automatic Slurry Handling System

As Sorensen so delicately put it, this moves the discussion from what goes into a pig to what comes out of him. And here, the real culprit is ammonia. Sorensen said that while we need ammonia in slurry, too much of it is lost through evaporation from slurry storage, barns and fields. If we can lower the pH level in slurry to around six, we'll reduce ammonia evaporation by 70 per cent.

This system accomplishes that by treating slurry with sulfuric acid every day in a process tank outside the barn. The fully automatic process allows for continuous, computer-controlled monitoring while ensuring complete documentation of the operation with data logging.

By stopping the evaporation of ammonia at the source, this system boosts employee and animal health with reduced ammonia in stable air and also benefits nature thanks to less ammonia in the atmosphere. Finally, since the

acidified slurry can easily be pumped into storage, the user will realize labour savings in the process.

Next on the development table for JH AGRO is Smellfighter. It may sound like a really lame superhero, but it's actually a system that separates out the solid parts of the slurry, resulting in a 50 per cent smell reduction on initial testing.

These systems won't be for everyone. Those who adopt them, though, may experience greater efficiency, more environmental benefits and, who knows, maybe even a better night's sleep.

## Part two: Infrared Thermography in the Swine Barn

**In the always-competitive pork industry, new technology is the best thing to come along since, well, old technology. A perfect example is the use of infrared thermography (IT) in the swine barn. It's something that Dr. Nigel Cook, a research scientist with the Livestock Research and Extension Branch of Alberta Agriculture and Forestry, loves to talk about. And with over 100 peer-reviewed publications to his credit, he knows of what he speaks.**

### What is Infrared Thermography?

Dr. Cook explained that this technology has three main components:

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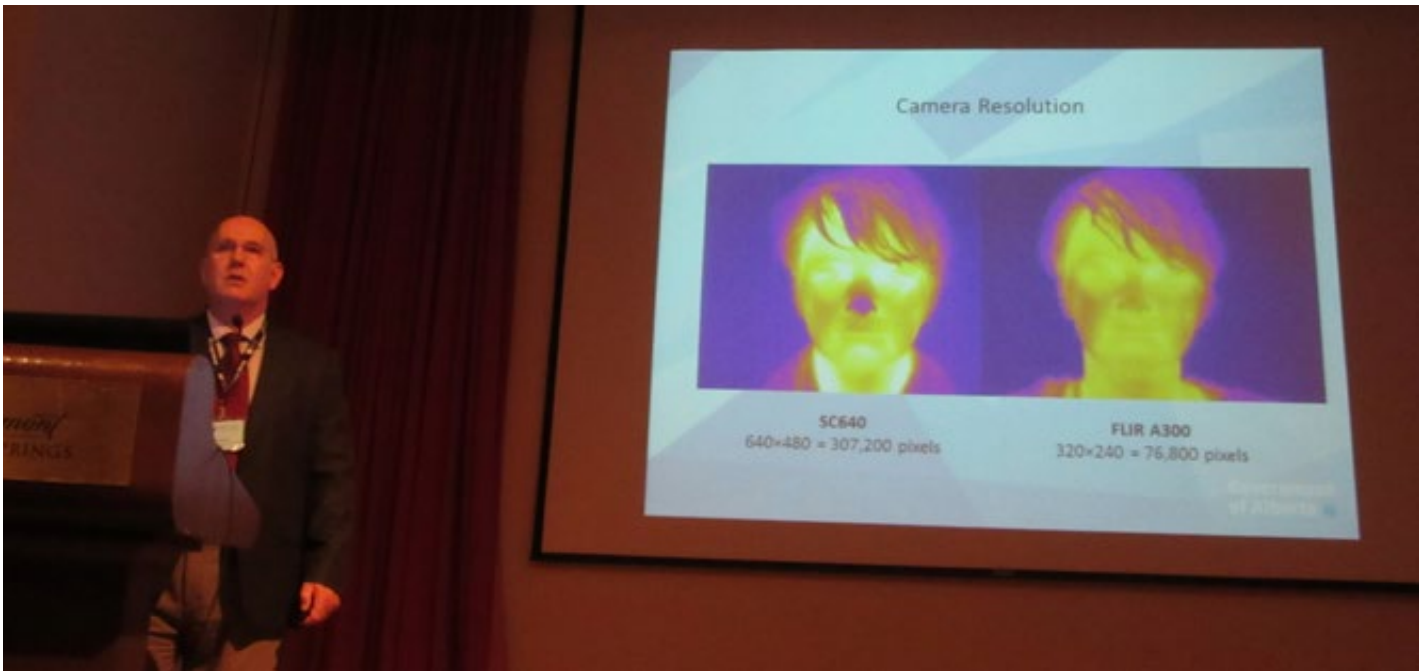
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Nigel Cook

1. Detection of infrared radiation emitted by an object
2. Conversion of infrared radiation to temperature
3. Display of temperature distribution as an image

All objects with a temperature above absolute zero (-273.15°C or -459.67°F) emit radiation in the infrared wavelengths.

### Why measure heat losses by Infrared Thermography?

Mammals and birds maintain a constant body temperature through homeostasis. Heat can be lost, however, through

induction, convection, evaporation and radiation (the most common method in pigs).

Cook cited several reasons for using IT to measure heat loss:

- Non-contact
- Automatable
- Non-invasive
- Sensitive to change
- Reflects metabolic activity
- Detects febrile responses
- Behavior can be measured from infrared images

## Cleaning

### Let the foam work for you!

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### Pick a camera, any camera

Measuring heat loss by IT requires a thermal camera. There are several to choose from, each with its own pros and cons:

1. **FLIR SC640:** It has the best range, accuracy and resolution, but at \$65,000 the cost may be hard to justify.
2. **FLIR A300:** The price tag of \$10,000 is less prohibitive than the SC640, but its lack of portability means it needs to be hard wired, limiting its flexibility.
3. **FLIR E40bx, FLIR i3 and FLIR AX8:** These all give you portability at a more reasonable price of between \$1,300 and \$3,200. With the lower price, though, comes lower resolution.

### Infrared thermography and disease

On average, there are between one and three emerging zoonotic pathogens per year. The most efficient way to counteract novel pathogens is to discover them early, which requires sound preparation and excellent surveillance. When incorporating IT as part of this counteraction, keep in mind that a number of factors can affect IT temperature:

- Reflected environmental infrared radiation
- Imprinted body heat

- Spatial distribution: The more animals that cluster together, the higher the ambient temperature recorded.

In a vaccination trial by Cook and his associates, they reached several conclusions about temperature:

- Setting a threshold temperature eliminates miscellaneous background
- Background temperature had no significant effect on pig temperature
- Spatial distribution affects temperature
- Vaccination affects spatial distribution
- Vaccination induces an increase in radiated temperature
- Increase in radiated temperature detected at 10 per cent prevalence
- In theory, only one pig needs to exhibit a febrile response to increase the maximum temperature recorded

There's still a lot to learn about the emerging field of infrared thermography. Whether you dive in now or choose a wait-and-see approach will depend on your needs and resources. Just be sure that if you do take the plunge, you know how to make the best use of the technology. The potential is exciting, but \$65,000 is a lot to drop on a hi-res selfie. ■







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