

FIRE DISASTER RECOVERY: PRODUCER AND VETERINARY PERSPECTIVES

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SUMMARY

A barn fire destroyed the farrowing barns in a large farrow-part finish operation. Daily events are reported and actions taken and measures to mitigate future losses described. The swine industry needs some basic, flexible protocols to deal with disasters.

INTRODUCTION

We never think it could happen to us and we assume insurance will take care of it if it does. Disasters occur but we are never ready. Each one is different, be it fire, flood, tornado or hurricane. Different sections of the barn could be affected, each with their own ramifications if they get wiped out. You cannot predict how an emergency situation will unfold.

Other industries have post-disaster priorities that could be used as model for swine operations. For example during the 2007 wildfires in Southern California, the IT industry was concerned about balancing the preservation of an information infrastructure while considering the personal and professional needs of displaced workers. A reverse 911 system where residents and personnel in the field are notified of emergencies by email and phone calls was particularly useful. This may be preferred as people did not have time to log onto their corporate websites or voice mail. In addition, crisis task forces consisting of heads of various departments in a company were assembled. These consisted of managers from IT, operations, HR, finance and legal.

In contrast, in swine production the welfare of animals and people are paramount. Animals need constant care with a daily source of feed and water. Depending on the time of year, the environment can be a critical factor in animal well-being (winter vs. summer disasters).

This presentation reports the effect of a fire on well-isolated 1800 sow farrow to part finish operation. There were seven staff working in the barns. The buildings were constructed in different stages between 1982 and 2004. The dry sow barns (consisting of pens and stalls) was naturally ventilated with the remainder of the facility being power ventilated.

Producer comments will be shown in italics.

Monday August 20/07 (Day 1)

At 12:45 a.m. on the morning of August 20/07, a fire broke out. This fire would destroy all of the farrowing facility as well as the nursery, breeding and parts of the gestation barn. Phone calls were made to the staff who came in at 3-4 a.m. to help out.

I received an email sent at 4 a.m. from the owner:

Hi

Wow...is all i can say..how do u think that the universe is all giving to what u need???? tonight i heard the fire sirens at 12:45ami came out to see my entire pig barn completely engulfed in fire....all my pigs in these front barns are dead.....i sit here and ask why.....how.....who.....and what reason.....is there one.....i am trying to believe that it is a bad nightmare and i am waking up now and all my pigs are fine.... i don't know what to say....i am at a loss.....what is the lessons what is the reasons.....

The office area was also destroyed. No water or electricity service was available. Only a day's worth of feed was present in the overhead feed canisters of the drop system.

There were several burned sows that survived the fire but the captive bolt gun was destroyed. Euthanasia of these animals was required and neighbours had to destroy about 20 of these.

The Fire Marshal's office, police and insurance company all wanted answers. Other people and equipment needed to be mobilized. Debris had to be cleared so animals could be rescued. A hi-hoe with a grasping "thumb bucket" had to be hired for removal of much of the debris. Some animals were trapped and had to be freed and also pockets of burning material had to be exposed and extinguished.

Unfortunately, an emergency contact list for OMAFRA personnel was not readily available because the office was destroyed. Priorities had to be quickly established to ensure the ongoing safety of people and animals and the environment.

1. People

- a. Emergency personnel were on site initially (fire, police) to extinguish the fire and investigate the origin of the blaze. Fortunately there were no human injuries as a direct result of the fire. A listing of chemicals stored on the farm had to be provided to the fire department.
- b. Equipment operators (hi-hoe, back hoe, skid-steer, dump truck, livestock trucks)
- c. Barn staff were on hand to attend to animals if possible and accessible.
- d. Veterinarian, OMAFRA welfare staff, Ontario Pork, Ministry of Environment, engineer were needed.
- e. Hydro One had to cut off power. (Electricians needed to install new lines and panel boxes to serve the dry sow barn).
- f. OFAC needed to be contacted to deal with the media.

2. Animals

- a. If any survivors could be moved to one of the other barns for feeding and holding pending a decision on their health. Feed carts had to be assembled since there was no power for the remaining intact feed system.
- b. Animals that could not find spaces for were shipped. Since the load-outs were destroyed, a makeshift chute consisting of barriers and people were used to guide the animals. There were about 80 sows from the front barn adjacent to the burned area that were shipped later that day but 20 died in transport. Also, 70/400 gilts survived the fire but 5/70 of these died in transport. (Originally, it was thought that all of the gilts perished, but it was still too hot later that day with fires still burning to fully assess the survivors). The question arose as to when should animals be shipped after a blaze or can they be shipped if there is any danger of inhalation of toxic fumes and smoke. Waiting 2 days before making marketing decisions if possible is suggested.
- c. A decision had to be made what to do with animals approaching their due dates as there was no farrowing facility.

3. Environment

- a. Disposal of casualties had to be arranged, trying to respect the “48 hour” rule for disposal if possible. A permit was required for mass burial but took 3 days to acquire as the site required inspection to avoid leeching and run-off. Again, a hi-hoe with a “thumb bucket” to grasp the carcasses with an experienced operator was important to have. (It took 7 days to clean up the deads. Staff were becoming overcome from the work, sight and smells).

There were no coveralls and boots for personnel initially and these had to be replaced. It was August, hot and humid with danger of heat exhaustion and stress overcoming both animal and human. Gutters were flooded with water and plugged with glass and insulation.

Scheduled feed deliveries had to be cancelled. The SEW customer also had to be notified that no pigs would be available.

There was an amazing out-pouring of support from the community and beyond. The local Great Lakes New Holland dealer (Ken Monteith) made a Pay-Loader available for scraping up debris and also a tracked skid-steer for going up and down the alleyways and smaller pits. Also, Stan's Total Tire was out to repair flats caused by nails and rods. Tim Horton's provided coffee urns and friends brought donuts. The herd veterinarian provided additional large Styrofoam coolers and extra ice packs (used for vaccine shipments) to keep food and drinks cold. The farm family prepared food and served sandwiches daily to all present.

August 21/07 (Day 2)

Now 24 hours without sleep. As time progressed, it became apparent that the staff was traumatized and some other equipment and comforts were needed. These included:

- *all meals were cooked and water and snacks were served*
- *ice packs in coolers with cold drinks*

- *an eating area was set up in the drive shed, out of the sun*
- *frequent rest breaks*
- *portable toilets were set up as well as washing facilities*
- *masks, shoulder length rubber gloves (Longos Kitchen Supply), boots, coveralls and possibly hard hats*
- *a dumpster was secured for debris and trailers were brought in for scrap steel*

Fortunately, phone calls to the barn were forwarded to the owner's cell phone before the fire, so a mobile office was already in effect. (For 30 days after the fire, 720 calls were answered).

Long days were required, starting at 6 a.m. ending at dark (8:30 p.m.).

The insurance company required inventory records. Fortunately, computerized records were backed up online weekly to orbit.com.

August 22/07 (Day 3)

This was the start of meetings with external people. Salvage of material was organized. Zubik's provided trailers for scrap metal. Concrete was to be crushed instead of buried and could be used for future roadway material. (The insurance company originally wanted the deadstock to go to landfill and the rubble buried. There were also discussions on what constituted income loss, i.e. just the farrowing and/or due to farrow). The accountant was to meet with the owner and insurance company, with the owner becoming overwhelmed.

August 23/07 (Day 4)

Another meeting on farm with Ontario Pork representatives (Ron Douglas and Doug Richards), OMAFRA Welfare (Mike Draper and Penny Lawlis) and herd veterinarian Dr. Paul Morris to establish and maintain animal welfare parameters and come up with solutions to pending farrowings and a game plan to address the reality that the herd will need to be liquidated. Efforts were to be made to salvage as many litters as possible.

There was no time, energy or resources to build new farrowing facilities using used farrowing crates. Labor was stretched too thin as it was. A plan was established where sows would be moved around to take advantage of both stalls and pens for housing sows. A total of 272 sows were shipped over the next few days to make room. Every other stall would house a nursing sow and piglets would be allowed to come in. The fronts and backs of the stalls would need to be boarded to prevent escapes. Slats in the "creep" area would need to be covered to prevent piglets getting their legs caught and so oral iron could be administered. Heat lamps would need to be wired in. Cordless power tools were essential as no power was established yet in the barn.

A second fire broke out in some old sandwich wall at the end of the day when most had gone home. The hi-hoe had to be called back and return again in 4 hours to make sure the fire was out.

All sows due to farrow after mid-October were to be shipped as soon as possible. This amounted to animals upto and including mid-gestation at about 2 months. Regulations state that animals are not to be shipped if there is danger of farrowing during transport. The attempt here was to salvage as many litters as possible but recognizing that cold weather was on its way. We set the last weaning to be the week of Thanksgiving October 8, as cold weather follows shortly. (In effect the last farrowing occurred October 22).

In retrospect, we should have shipped the first 3 months of gestation. We had 8 weeks of farrowings with about 50%PWM as weaning age was brought down to about 14 days as only 136 stalls were available compared to the original 252 crates lost in the farrowing rooms. Dollars were lost on feed, cull sows, labor and mortality.

August 24/07 (Day 5)

Shipping was coordinated so feed tanks could be emptied. The feed system was in discrete bins and loops separate from other portions of the barns that had not been destroyed.

Another veterinary visit was made to help document welfare and recommend modifications. With the number of visitors, it was now becoming a public facility with a lot of scrutiny.

August 25/07 (Day 6)

More sows were shipped and clean-up proceeding. Priorities continued to involve removal of deadstock.

Made use of a Koolmees dump trailer (www.koolmees.ca) suggested and located by Walter Gross, Husky dealer in the area. This sealed trailer is pulled behind a tractor and hold liquids, body parts and liquid manure for dumping. It is manufactured in Norwich Ontario.

August 26/07 (Day 7)

No visitors, a quiet Sunday. The police are still cruising the road at random times.

August 27/07 (Day 8)

The hi-hoe is still working at clean-up.

August 28/07 (Day 9)

Another veterinary visit, more pictures taken to document welfare. *Shipped the herd boar "Gus".*

At times it felt like there were individuals attempting to poach staff away, equipment that survived the fire seems to have disappeared, especially cordless tools. Unknown if others burned or disappeared. Storage of parts, tools and equipment were in disarray.

September and October/07

Separation and recovery of steel, concrete and plastics, with the burning of wood proceeded. A machine recycles the concrete by crushing and removing the rebar making crushed gravel and sand for roadways.

The metal recycler complains of body parts adhering to the steel (somewhat like a roasting pan).

Meetings with builders, supplier accounts payable and other companies. The owner's job function became more of a project manager.

There were a lot of unknowns entering the fall, with no cash flow except from the culls to meet the payroll.

November 10/07

The last shipping (originally was to be Thanksgiving). With temperatures falling, growth slowed. Staff adjustments made with 2 quitting, 1 laid off and 2 remaining).

Most of staff injuries were bruising.

Certainly, the outcome would have been much worse if the fire had occurred in winter or if it was a wet summer. Animals could have froze or removal of debris hindered by snow and ice.

Recovery, Healing and Rebuilding

In spite of the fire and clean-up, a routine of getting up early and finding distractions and keeping busy continued. These included cleaning the house and doing renovations such as painting. It seemed that building or creating something would offset the destruction that occurred. It was a part of healing and recovery. Could not sit still and watch a movie for example. There became a great reliance on a network of positive people (not just in the family) who you could connect with and help you move forward.

The mutual insurance company (small) did not want to re-insure due to the high loss. The owner felt isolated. Other farmers who have had fires were contacted for their perspective in dealing with insurers.

The rest of the fall was spent emptying pits, washing the barns, disinfecting, eliminating rodents and determining measures to reduce risk of fire in the future. The use of an infrared heat gun to identify sources of heat is one technique. Consider using an outdoor furnace, no heat lamps, diesel power washer.

WHAT IF....

- The fire occurred in winter?
- The entire operation was power ventilated?
- The fire occurred on a Saturday evening?
- The barns were much further from an urban area?

IF IT HAPPENED AGAIN, I WOULD.....

- Ship sows up to 3 months gestation instead of shipping at mid-gestation
- *Consider buying a used hi-hoe since rentals can be expensive*
- *Keep up to date quotes (appraisals) on desired facilities*
 - *have replacement cost in the insurance policy only*
 - *anything greater than 10 years should have new replacement vs “like” replacement*
- *Be sure to get lots of rest*
- *Make sure morale is maintained, keeping everyone looking forward to homemade meals: the family took care of the family plus the employees*
- Maintain a call list for emergencies and keep in farm office and house:
 - OMAFRA personnel (Penny Lawlis and Mike Draper, 1-888-466-2372)
 - Ontario Pork (Doug Richards and Ron Douglas, 1-877-ONT-PORK)
 - Herd Veterinarian
 - Ministry of Environment (Glen Ross, Environmental Officer)
 - 1-800-268-6060
 - Hydro One (1-800-434-1235)
 - Contractor for hi-hoe and thumb bucket
 - Metal Recycler
 - Concrete crusher
 - OFAC (Crystal McKay, 1-905-821-3880)
 - Electrical Safety Association (Tony Titus) 1-877-372-7233 (www.esasafe.ca)
 - Electrician
 - Portable toilets
 - Local equipment dealers
- Have lots of cordless tools
- Have a list of chemicals stored on the farm
- *Make sure all farm data (inventory, production and financial) is stored off site, possibly scan documents so they are all digitized*

MECHANISM OF SMOKE INHALATION INJURY

In humans, smoke inhalation is the primary cause of death in about 60% to 80% of the 8,000 victims of burn injuries each year in the United States. Airway injury occurs in up to one third of those with major burns, and the risk of concurrent pulmonary damage is directly related to the extent of surface burns present. Inhalation injury greatly increases the incidence of

respiratory failure and acute respiratory distress syndrome. It is also the cause of most early deaths in burn victims. The mortality rate following smoke inhalation ranges from 45% to 78%. One study estimated that the burn-related death rate is 20% higher in people with combined inhalation injury and cutaneous burns than in those with cutaneous burns alone. (references cited by Lee-Chiong, 1999).

Lung damage occurs in two phases with the first phase characterized by the influx of cells and fluids and the release of inflammatory agents followed by repair and scarring.

The constituents of smoke can cause collapse of lung tissue resulting in fluid accumulation (edema) and burns in the neck area can result in upper airway scarring and reduction in airway diameter. Clearance of debris via the hair-like cilia is impaired and the risk of pneumonia is increased (Lee-Chiong, 1999).

Wood smoke is a very potent deactivator of surfactant, the material lining the air sacs (alveoli) that keeps them inflated. Loss of surfactant can result in the alveoli in areas of lung collapse to be adjacent to healthy areas of lung. The shear-stress of lung tissue movement with each breath causes further trauma to lung tissue with the release of inflammatory agents that cause further damage (Steinberg et al 2005). Therefore mortality can occur several days or longer following the insult (Sakano et al, 1993).

Carbon monoxide per se is not the primary origin of smoke inhalation injury (Shimazu et al, 1990). Multiple organ failure has been noted in dog studies (Nie et al, 2005). The mortality rate of human smoke inhalation victims without a burn is <10% but with a burn, the mortality rate is 30-50%, suggesting that thermal injury or its treatment is responsible for further lung damage (Clark, 1992). However, in burn patients, smoke inhalation resulting from a single domestic fire does not necessarily imply long-term respiratory health consequences (Bourbeau et al.1996).

Treatment

From a practical stand-point, provide fresh air as soon as possible. Try and humidify the air (try using a pressure washer for example). If animals are retained, there is a possibility of acute lung damage from the fire and smoke developing into pneumonia and airway disease days or weeks after the fire. This means that insurance adjusters will need to address post-fire claims. Anti-inflammatories are not effective in human victims.

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