Pig and pork zoonoses in Uganda

Presented at a training course for pig farmers organized by Pig Production and Marketing Uganda Ltd

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Part of two research projects by the International Livestock Research Institute (ILRI)

• Smallholder pig value chain development project (IFAD-EU)
• Safe Food, Fair Food (BMZ/GIZ)

with local partners (Makerere University, MAAIF, district government, NGOs) in Masaka, Kamuli and Mukono districts.
Outline

- A brief introduction to zoonoses
- I am just a farmer, why care about zoonoses?
- Selected pig zoonoses identified in Uganda, transmission and management
What are zoonoses?

“Diseases that can be transmitted between animals and people and vice versa”

7 billion world population: 55 million die each year

18 million from infections: 60% shared with animals

1.2 million from road traffic accidents

170,000 from fatal agricultural accidents
20,000 from extreme weather conditions
Prevent Rabies
Protect yourself and your family

Take all your dogs and cats for vaccination to the nearest Veterinary staff

Strange disease kills family of 12 in Kibaale

Health experts say residents should not panic as investigations are ongoing.
Transmitted by contact: worms

- Very common
- Whipworm, roundworm
- Enormous economic losses
- Stunted growth and malnutrition in piglets but also in children
- Good management: regular deworming (albendazole/ivermectine) and biosecurity

Littermate Hampshire pigs: control 91kg – infected 41kg
(Photo courtesy of Louisiana State University, US)
Diamond skin disease

- Reported by farmers in Kamuli
- Bacterial disease (*Erysipelothrix rhusiopathiae*)
- In pigs from 3 months to 1 year, 3 forms of the disease:
  - 1: sudden death without any signs
  - 2: diamond skin, fever, abort
  - 3: fever, joint pain, heart failure
- In people (mostly butchers, vets, pork handlers): like form 3 starting with painful skin infection
- Easy treatment with Penicillin

Photo courtesy of Richard Jakowski, DVM, PhD, DACVP
Many are transmitted by food

- At least 2 billion cases of diarrhoea worldwide per year (up to 90% attributed to food)
- 1.5 million children under 5 die because of diarrhoeal diseases (80% in South Asia and Africa)
- In sub-Saharan Africa, 80% of the food from animals is marketed informally
- Animal-source foods are single most important source of foodborne disease
I am just a farmer, why care about zoonoses?

- „Majority of pork in Kampala contaminated“ ➔ with what?
- „Increasingly risky for human consumption“ ➔ consequences?
- „Loyal pork consumers face running mad“ ➔ per se?

Daily Monitor, 6 June 2012
I am just a farmer, why care about zoonoses?

- „**ALL** pork supplied in Kampala for human consumption is contaminated“
  - defamation, severely damaging a sector’s reputation

- „Threatening to close all pork joints around the city“
  - risk of unemployment

Red Pepper, 13 June 2012
Did you feel any impact on your business after this publicity?
It’s because you are part of a system:
Pigs and pork in Uganda

- Highest per capita consumption in SSA (3.4 kg)
- Explosion in pig numbers over the past 30 years (0.19-2.3 million pigs, FAO)
- Mostly in hands of small holders, especially women’s activity
- Live asset, “piggy bank”
- “Pork joint” phenomenon
- Small formal sector with processed pork products (i.e. ham, bacon, salami)
Pork consumption in Kampala

ILRI/BMZ Safe Food, Fair Food
# Pig zoonoses in Uganda

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<td>Enterovirus</td>
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<td><em>Staphylococcus aureus</em></td>
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<td><em>Yersinia</em> spp.</td>
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Cysticercosis

- What do you see here?
- Could eating this meat make people sick?
- What would be the symptoms of the sickness?
- What signs did the live pig show?
- What can you do to manage this disease?

Photo courtesy of Dr. A. Lee Willingham III, WHO/FAO Collaborating Center for Parasitic Zoonoses, Denmark
Cysts in the human brain causing epilepsy. If people ingest eggs of the pig tapeworm (e.g. when not washing their hands before eating), these may develop in the brain, the eye or other parts of the body: http://www.cdc.gov/parasites/cysticercosis/biology.html
LET'S BREAK THE PORK TAPEWORM CYCLE

with these 6 easy steps

1. Always use a toilet.
   Use a toilet to stop worm eggs infecting pigs and other people.

2. Wash your hands.
   Tapeworm eggs are too small to see and spread easily. So wash your hands well with soap and clean water after using the toilet and before touching food.

3. Go to the clinic.
   If you think you have tapeworm, go to the clinic and get treatment as soon as possible. Deworming medicine will kill the tapeworm and stop you from infecting pigs and other people.

4. Stop pigs from roaming.
   Keep your pigs in a kraal or tied to a stake, so that they can't eat human faeces containing tapeworm eggs.

5. Check meat is safe.
   Check meat carefully to make sure there are no cysts. Meat with cysts should not be eaten or sold.

6. Cook meat well.
   It is better to be safe than sorry. Pork must be cooked thoroughly so that there is no pink meat and no blood running out. This will kill any tapeworm cysts and prevent infection.

THE PORK TAPEWORM CYCLE

- The tapeworm (Taenia solium) lives inside the small intestine. It absorbs food and can grow up to 3 metres long.
- Pork infected with cysts. The eggs grow into cysts and can be found in infected meat.
- People get tapeworms when they eat the cysts in undercooked meat.
- Thousands of tapeworm eggs come out with the faeces. Tapeworm segments can be seen in the faeces. They release thousands of eggs into the environment.
- The eggs spread easily. Worm eggs can contaminate the soil and water supply. They also get on our hands, food and drinking water.
- Swallowing tapeworm eggs is dangerous. Tapeworm eggs grow into cysts in the brain, eyes and muscles causing epilepsy (fits), blindness, paralysis, severe headaches, insanity and even death.
- The tapeworm cysts in the brain, eyes or muscles cause epilepsy (fits), blindness, paralysis, severe headaches, insanity and even death.

Pigs get infected.
Free-range pigs get infected by eating human faeces containing tapeworm eggs.

This child has a tapeworm growing inside him.
Managing cysticercosis on farm

- Detection in live pigs is very difficult; treatment possible in theory (Oxfendazole) but not feasible

- Better to observe good management practices:
  - Use toilets
  - Wash your hands with soap after the toilet, before eating and after touching the soil
  - If you think you have a worm infection, go and see a doctor who can easily treat worm infection (praziquantel)
  - Observe good biosecurity for your pigs (confinement, limited outside visitors)
  - Cook pork thoroughly, boil drinking water
Trichinellosis in people

- Parasitic disease
- 2 days after the ingestion: Nausea, Diarrhoea, Vomiting, Abdominal pain
- 2-8 weeks after the infection: flu-like symptoms muscle pain, fever, swelling of the face (particular the eyes), weakness/fatigue, headache, chills, itching, cough, diarrhoea, constipation
- Normally, recovery after few months but sometimes breathing and heart problems until death

Photo courtesy of Emory U/Dr. Thomas F. Sellers Creation Date: 1963
Trichinellosis

Challenges:

- Larvae in meat not visible with bear eyes
- Pigs not sick
- Symptoms in people flu-or malaria-like
- Trichinellosis not commonly known in Uganda, so doctors may not think of it
Trichinellosis
Managing trichinellosis on farm

- Detection in live pigs is very difficult; treatment possible in theory (Albendazole) but not feasible
- Better to observe good management practices:
  - Confinement (no interaction with wildlife)
  - Don’t allow your pigs to eat meat scraps, lizards, snakes, birds and rodents
  - Cook your meat thoroughly
Toxoplasmosis in people

- Parasitic disease; >60% infected worldwide but no signs of sickness

At risk are:

- People with HIV or other chronic conditions
- Pregnant women and their unborn children*
- The infection can be re-activated if a person was infected while healthy but is immuno-compromised at a later time
- Eye pain, tearing of the eyes, sensitivity to light, blurred vision – can lead to blindness
- Fever, confusion, headache, seizures, nausea, and poor coordination because of brain infection
Managing toxoplasmosis on farm

- Detection in live pigs is very difficult; treatment possible in theory (Sulph, Trim) but not feasible
- Better to observe good management practices:
  - Confinement
  - Keep cats out of the piggery and the feed store
  - Rodent control
  - Cook your meat thoroughly
Environmental contamination and cross-contamination of fruits and raw vegetables!
Trypanosoma spp.

- Pigs can die suddenly or
- Don’t show any signs
- Pigs can be carriers of human sleeping sickness
Brucellosis in people

- Bacterial disease: *Brucella*
- Eating undercooked meat
- Consuming unpasteurized/ raw milk or dairy
- Breathing in the bacteria
- Skin wounds (vets, slaughter staff, meat handlers, hunters)
- Symptoms: recurrent fever and joint pain (often falsely confused with *malaria*!), abortions

Courtesy of Dr Joseph Erume
DAAD post doc fellow at ILRI
Brucellosis in pigs

- Transmitted between pigs through contact/copulation
- In boars often inflammation of one testicle
- Lameness, sometimes paralysis
- Infertility, abortion at any stage of gestation, birth of dead or weak piglets
- Related to *Brucella* in cattle, sheep and goats; can grow on cows udder and contaminate milk

- Management: culling; vaccination not common in pigs
- In Masaka, Mukono and Kamuli districts it occurs very rarely
Salmonellosis in people

- Bacterial disease: *Salmonella*
- More than 2000 strains, it is everywhere, some strains cause sickness in people
- Acute onset of fever, abdominal pain, diarrhoea, nausea and sometimes vomiting; sickness starts 6-72 hours (usually 12-36 hours) after ingestion, and illness lasts 2-7 days
- In otherwise healthy people no treatment necessary but children and elderly must be re-hydrated or they could die
- Can be transmitted through consumption of eggs, meat, poultry and milk), green vegetables contaminated by manure, or from sick people; 20% attributed to pork consumption
Salmonellosis in pigs

- Affects mostly weaners and growers, especially when stressed (weaning, re-grouping, transport)
- Diarrhoea but more often respiratory disease and fever, shivering, reddening of ears, nose and under-belly, death can also occur
- Piglets and older pigs may not show signs but are carriers
- 100 meat and faecal samples from Masaka, Mukono and Kamuli districts at Kampala city slaughterhouse
- *Salmonella* spp. isolates from 50% samples
- Resistant to antibiotics: Sulfameth > Ampic > Tetracycline > Penic

Courtesy of George Tinega, MSc fellow at ILRI
How Antibiotic Misuse on Factory Farms Can Make You Sick

1. Factory farms use feed that’s pre-mixed with antibiotics to promote faster animal growth and prevent infections.

2. Giving low doses of antibiotics to groups of animals over extended time periods fuels the development of antibiotic-resistant (AR) bacteria.

3. The digestive tract contains many bacteria. Low doses of antibiotics kill some bacteria. AR bacteria survive and reproduce, passing along the resistance genes. AR bacteria also share resistance genes with other bacteria through "horizontal gene transfer."

4. AR bacteria in livestock can spread to farmers, farmworkers, meat plant workers, and the general population.

5. Consumers encounter AR bacteria while handling raw meat and eating undercooked meat.

6. Waste is stored in lagoons and used as fertilizer. AR bacteria in the waste continue to reproduce and share genes with other bacteria in soil, streams, ponds and groundwater, creating “reservoirs of resistance.”

AR bacterial infections have become increasingly common. Doctors are concerned that some antibiotics no longer work to treat sick people.

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