Taenia solium Cysticercosis in Western Kenya

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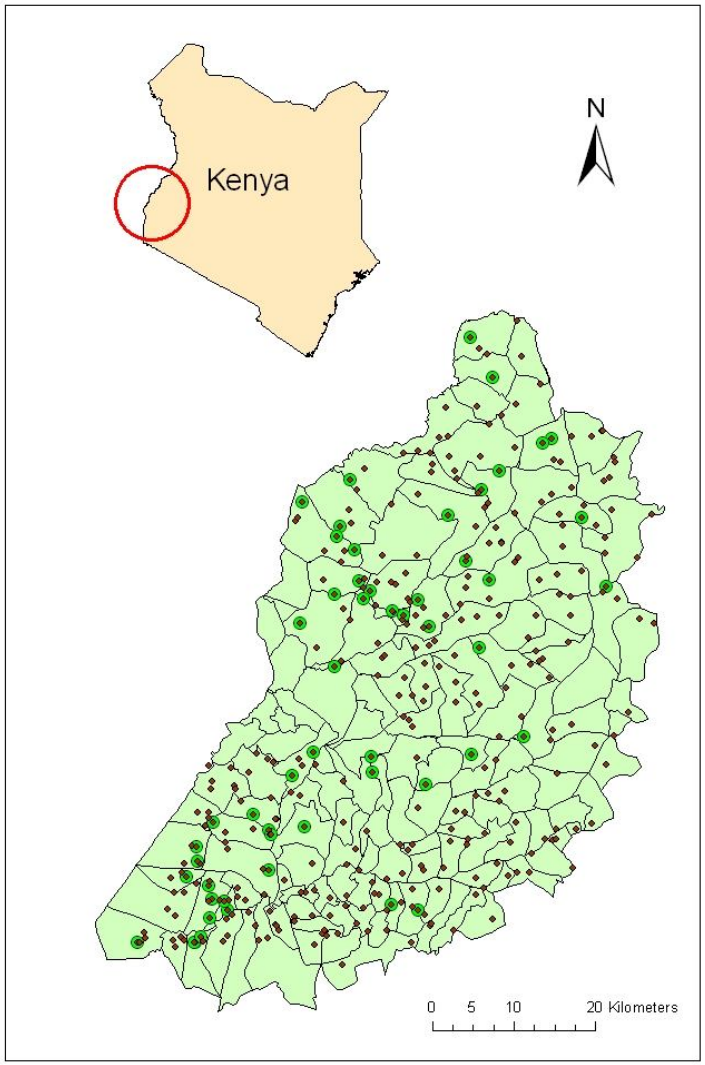
Overview

- People, Animals and their Zoonoses
- Preliminary Results
- Regional Picture
- Food Chain Risk Analysis
- Pen-side diagnostic development
- Free-range pig ecology
- Future development of this work

People, Animals & their Zoonoses

- Cross-sectional survey Western Kenya
  - Multi-species
  - Multi-pathogen
  - Inter-disciplinary
  - Collaborative
- 413 comprehensive homestead surveys
  - 370 homes visited thus far
  - 1782 people
  - 904 cattle
  - 247 goats
  - 81 pigs



Slaughter Slab Survey

- 343 pigs sampled
- March – September 2010
- Licensed slabs
- Lingual Palpation
- Serology using HP10 Ag-ELISA

Preliminary Results

- Raw data presented at meeting removed – publications to follow later this year!

Regional Collaborations (data to be published later)

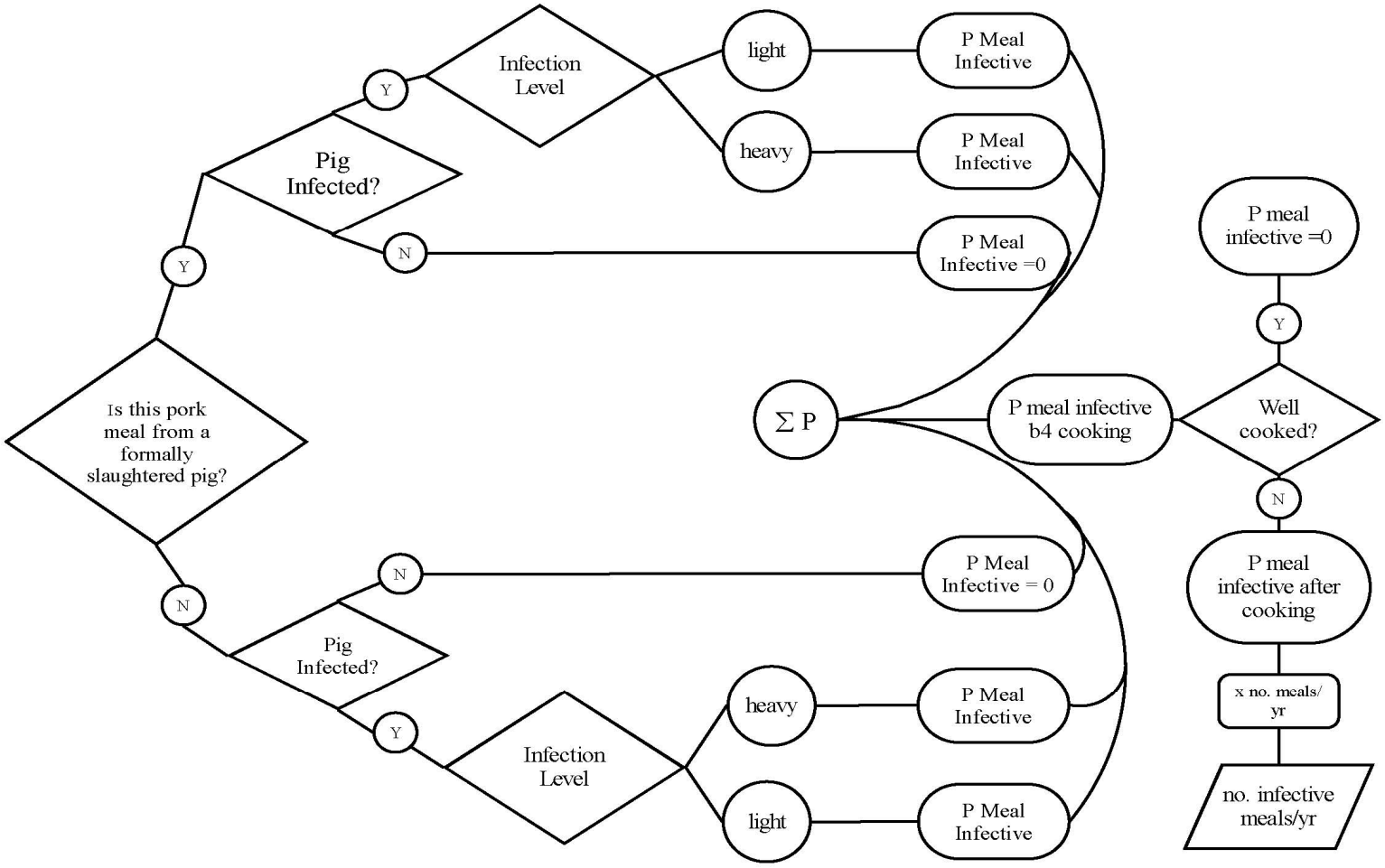
- Homa Bay (Kenya)
  - University of Nairobi
  - Farm based, multi-stage, random selection of villages
  - All pig-keeping homes within selected villages sampled
  - 232 samples tested with HP10 Ag-ELISA

- Lake Kyoga (Uganda)
  - Makerere University
  - Farm based, multi-stage random selection of sub-counties
  - House-to-house vists until minimum sample size per sub-county achieved
  - 378 samples tested with HP10 Ag-ELISA

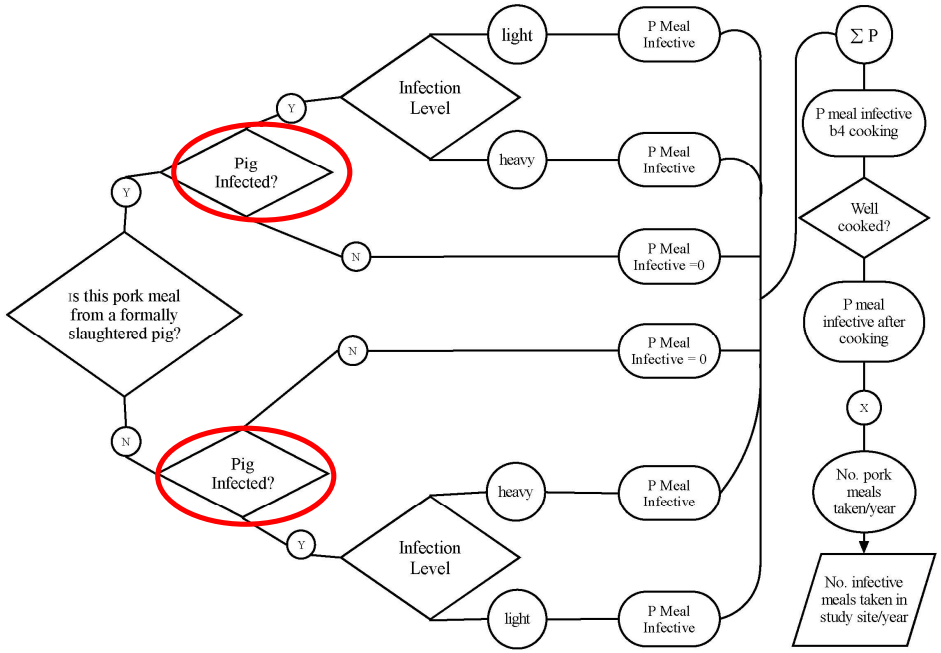
Food Chain Risk Assessment

- Determine the risk of any single pork meal eaten in Western Kenya being infectious with *T.solium*

Model Structure



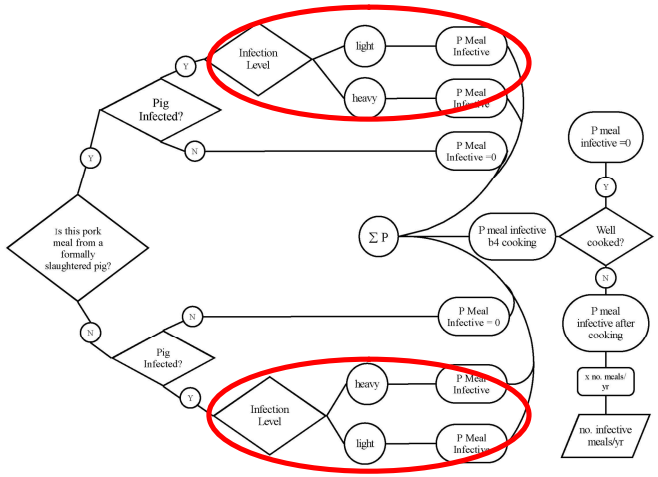
Risk pig is Infected with *T.solium*



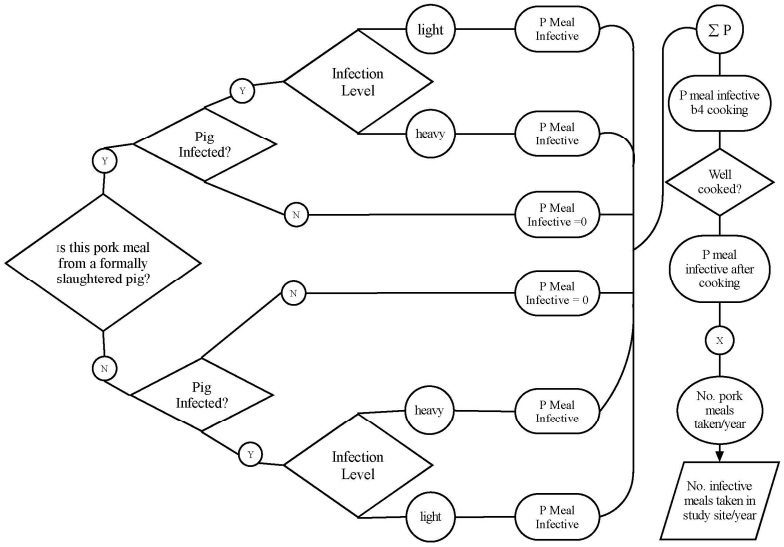
- Data from PAZ slaughter slab survey
- 48% Pigs positive on HP10 Ag-ELISA
- Indicates pigs with viable cysts
- Literature suggests no significant difference in prevalence between formal and informal slaughtered pigs

If pig is infected; what is the probability of any one meal containing cysticerci?

- Based on experimental infection data (Sciutto *et al.*, 1998 & Deckers *et al.*, 2008)
- Level of infection of pig
  - Dissection and numeration of cysts
  - Beta distribution for proportion
- Proportion of meals infected in different infection levels
  - no. cysts/ 2kg pork
  - Average meal size of 0.25kg (assumption)
  - Uniformly distributed as little prior knowledge



Is the pork well cooked?

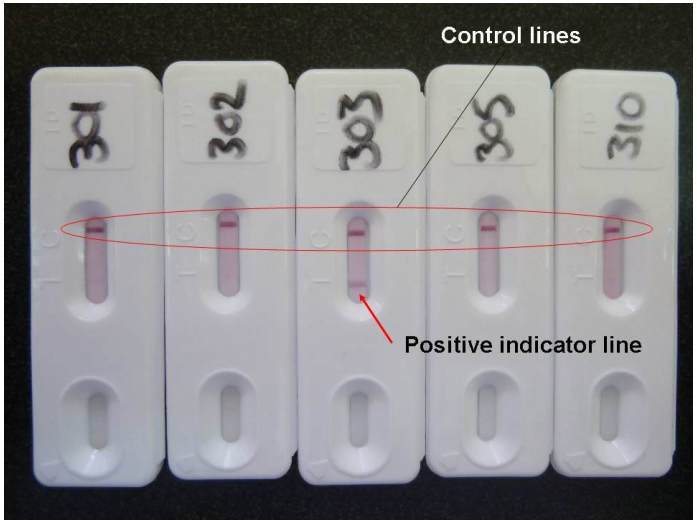


- PAZ homestead survey data
- Any response bar 'Brown throughout' or 'Fully Roasted' = potential for undercooked (17%)
- Beta distribution

Model Output:
what is the current state of affairs?

- Data removed pending publication

What can be done?



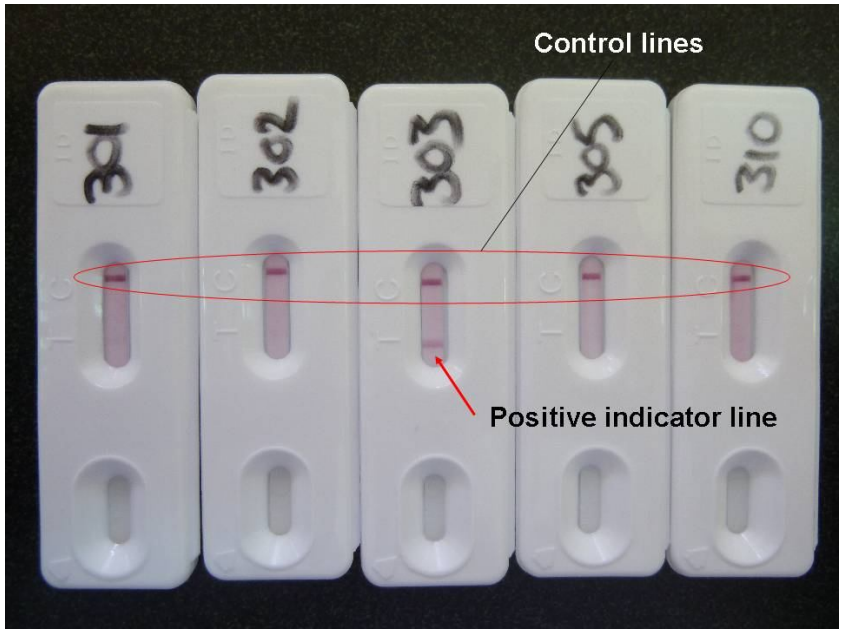
Pen-side diagnostic developments

Benefits:

- ✓ Relatively cheap & quick
- ✓ Little training needed
- ✓ Currently in development (ILRI/UoE)

Barriers:

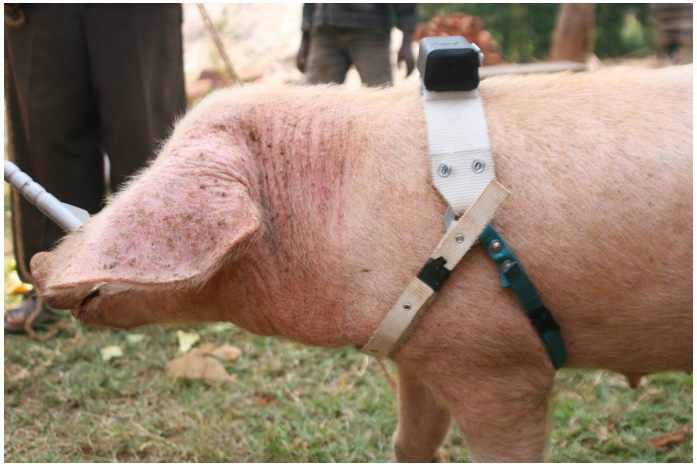
- ✘ Requires incentive for use

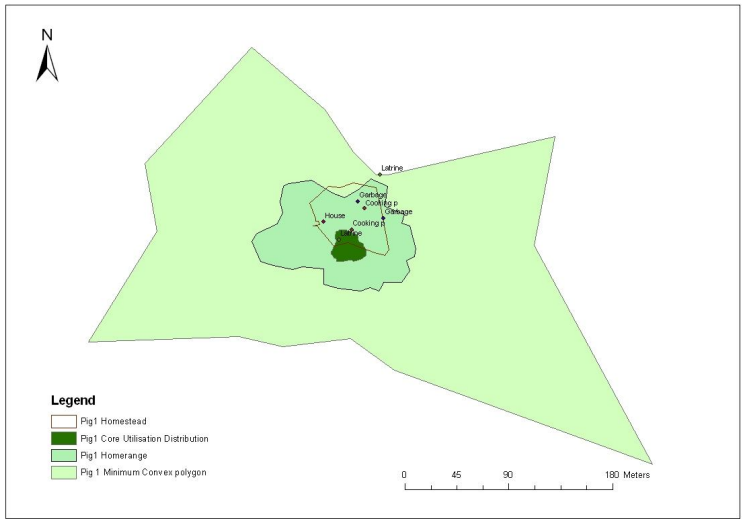


How might this tool be used in control?

Free-Ranging Pig Ecology Study

- 10 randomly selected pigs
- Data removed pending publication





Summary

- *T.solium* endemic in Western Kenya and areas of Uganda
- Very high number of infective pigs slaughtered
- Huge potential for infective meat to reach consumer
- Several interventions have potential to reduce this risk
- Exclusion of infective pigs using new diagnostic test is realistic and achievable

Which way now?

- Finish laboratory diagnostics
- Analysis of co-infection data and risk factors
- No-gold-standard analysis of pen-side test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And thank you for listening!