SAFE FOOD FAIR FOOD in Uganda

Photo by Angella Musewa, in the field in Masaka district on April 9, 2013

Kristina Roesel
FUB/ ILRI
Kampala, 6 May 2013

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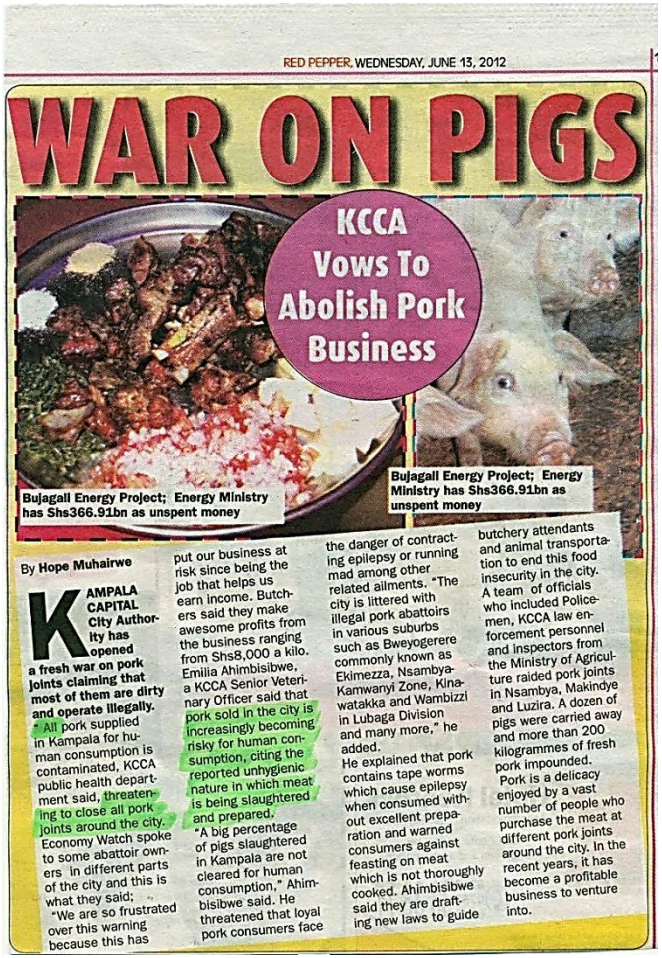
CGIAR Research Program on Nutrition and Health

ILRI
INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE

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
- Bad reputation among policy makers



RED PEPPER, WEDNESDAY, JUNE 13, 2012

WAR ON PIGS

KCCA Vows To Abolish Pork Business

Bujagali Energy Project; Energy Ministry has Shs366.91bn as unspent money

Bujagali Energy Project; Energy Ministry has Shs366.91bn as unspent money

By Hope Muhairwe

KAMPALA CAPITAL City Authority has opened a fresh war on pork joints claiming that most of them are dirty and operate illegally.

"All pork supplied in Kampala for human consumption is contaminated, KCCA public health department said, threatening to close all pork joints around the city.

Economy Watch spoke to some abattoir owners in different parts of the city and this is what they said;

"We are so frustrated over this warning because this has put our business at risk since being the job that helps us earn income. Butchers said they make awesome profits from the business ranging from Shs8,000 a kilo.

Emilia Ahimbisibwe, a KCCA Senior Veterinary Officer said that pork sold in the city is increasingly becoming risky for human consumption, citing the reported unhygienic nature in which meat is being slaughtered and prepared.

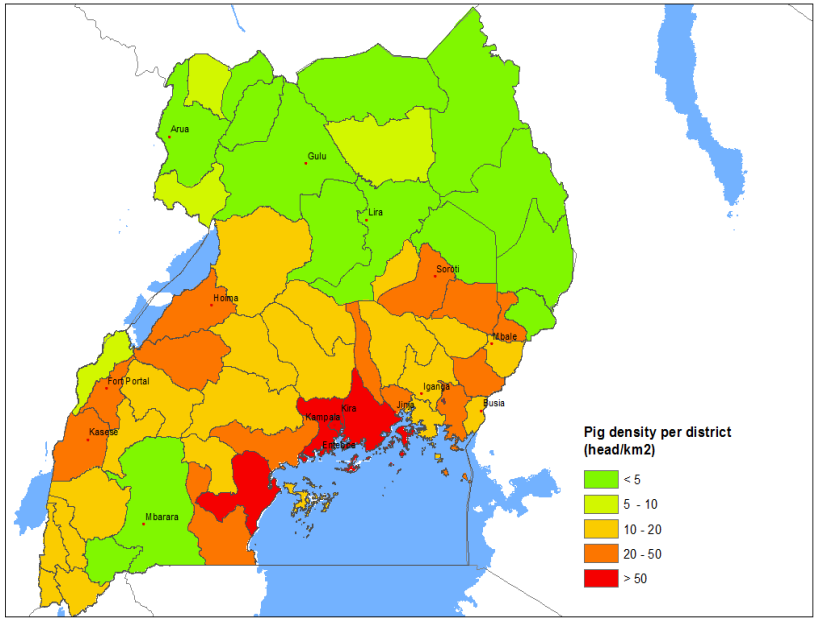
"A big percentage of pigs slaughtered in Kampala are not cleared for human consumption," Ahimbisibwe said. He threatened that loyal pork consumers face the danger of contracting epilepsy or running mad among other related ailments. "The city is littered with illegal pork abattoirs in various suburbs such as Bweyogerere commonly known as Ekimezza, Nsambya-Kamwanyi Zone, Kinawatakka and Wambizzi in Lubaga Division and many more," he added.

He explained that pork contains tape worms which cause epilepsy when consumed without excellent preparation and warned consumers against feasting on meat which is not thoroughly cooked. Ahimbisibwe said they are drafting new laws to guide butchery attendants and animal transportation to end this food insecurity in the city.

A team of officials who included Policemen, KCCA law enforcement personnel and inspectors from the Ministry of Agriculture raided pork joints in Nsambya, Makindye and Luzira. A dozen of pigs were carried away and more than 200 kilogrammes of fresh pork impounded.

Pork is a delicacy enjoyed by a vast number of people who purchase the meat at different pork joints around the city. In the recent years, it has become a profitable business to venture into.

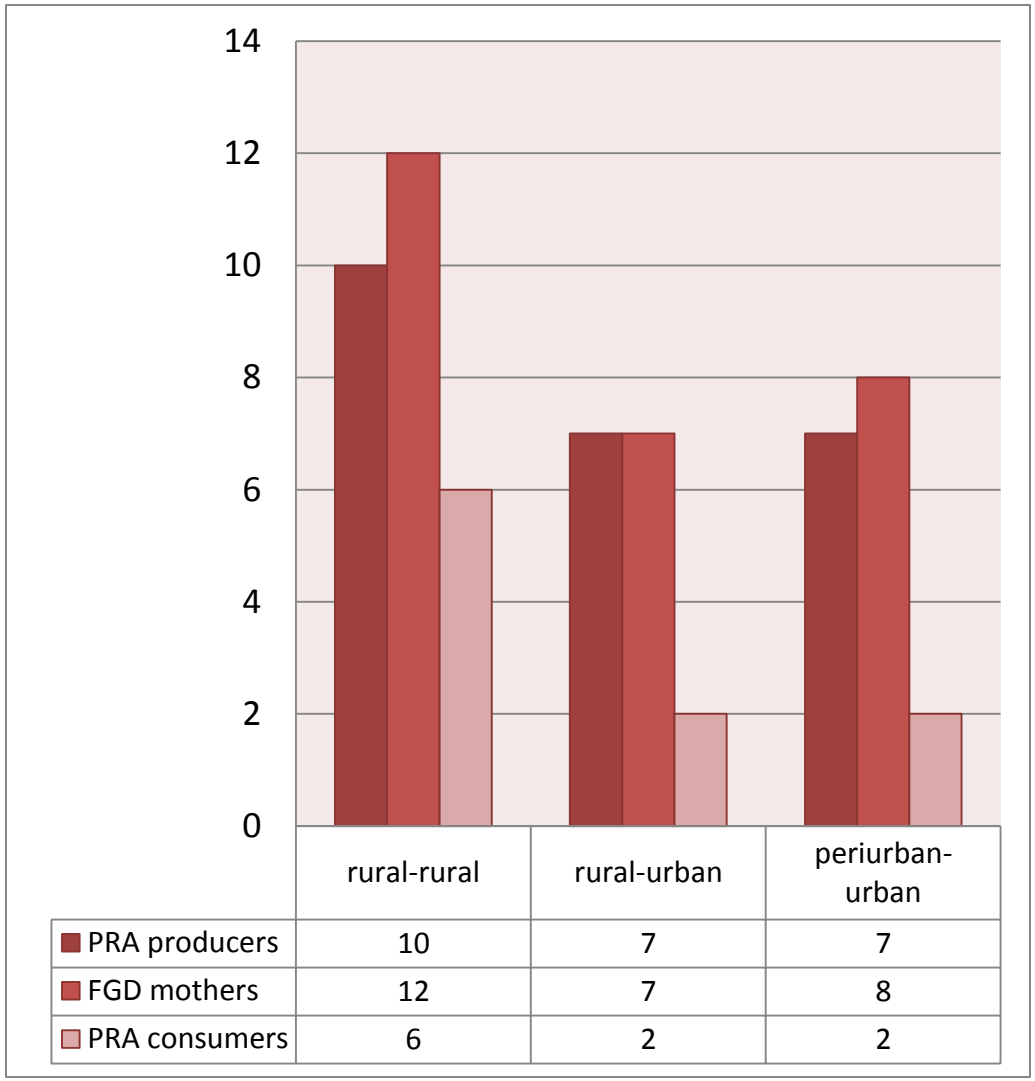
Integration



- Well integrated to ILRI Livestock & Fish value chain project (small holder pig value chain development project, SPVCD)
- Value chain assessment only started in November 2012 after sites were selected under SPVCD
- In the first year: rapid integrated assessment of food safety and nutrition in 3 districts in Uganda, 4 complementary studies, 4 postgraduate projects, 1 intern

Rapid integrated assessment of food safety (and nutrition)

- 24 participatory rural appraisals with pig producers
- 10 participatory rural appraisals with pig producers as consumers
- 27 focus group discussions with mothers of young children
- 2 female and 2 male facilitators trained in the food safety assessment tool



	rural-rural	rural-urban	periurban-urban
PRA producers	10	7	7
FGD mothers	12	7	8
PRA consumers	6	2	2

101 men, 194 women participated

Procedure of integrated VCA

- Recruitment and training of facilitators
- 2x pre-testing of tools
- Random selection of 40 pig farmers in each of the 34 villages
- Launching workshop in each district to introduce projects to all stakeholders and review tools with local veterinary, animal production and extension staff

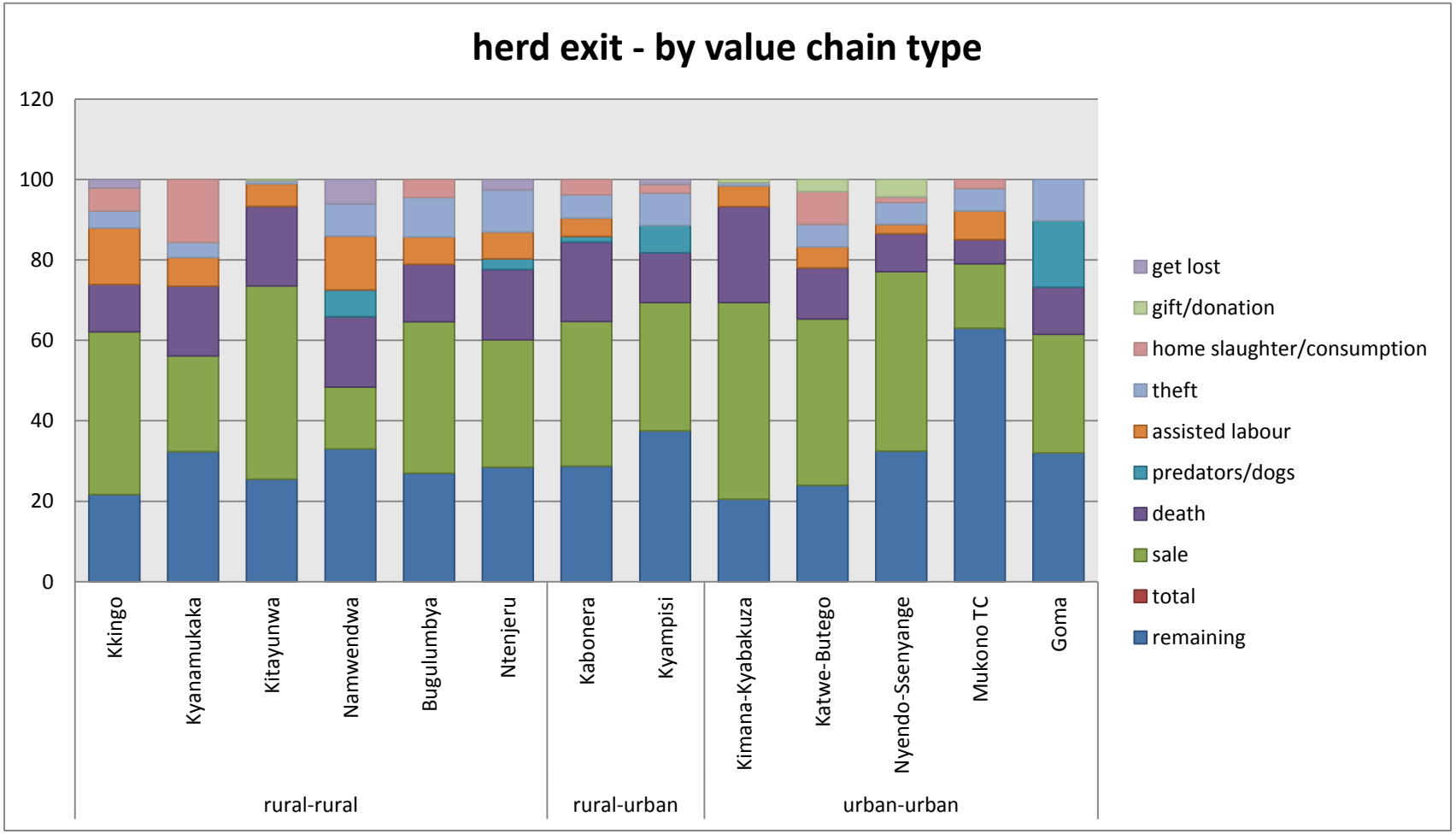
A typical VCA day in the field

- Plenary to introduce projects and obtain consent
- Participants randomly allocated into 4 groups à 10 pax plus one group of key informants
- Morning session:
  1. feeds/ breeds
  2. Value chain mapping/ markets
  3. Animal health
  4. Food safety/ nutrition
- Tea and lunch provided
- Plenary after lunch where each group presented the constraints and opportunity matrix
- Afternoon session: 2 groups of women/ 2 groups of men – decision making/ activity clock

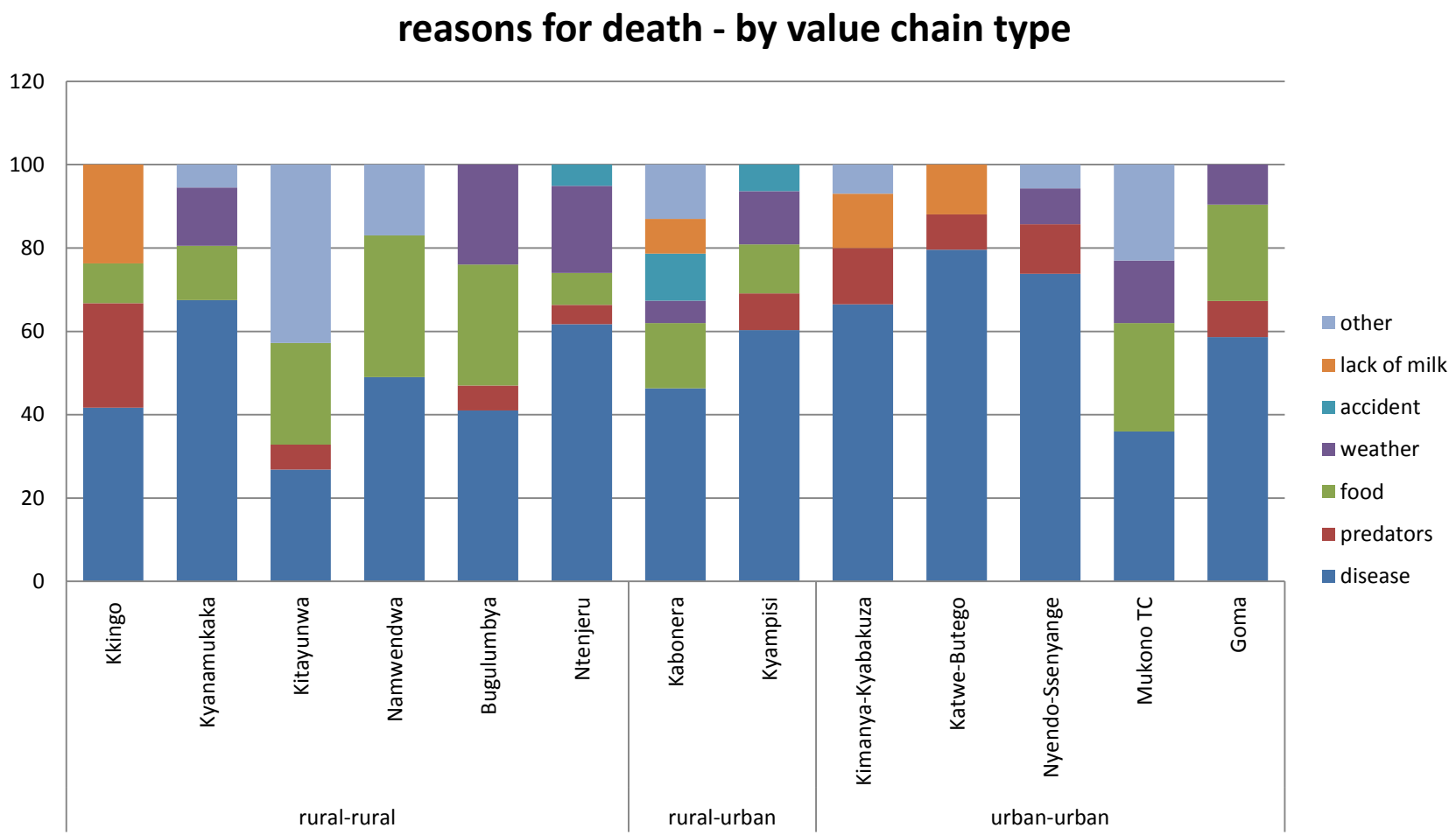
Results:
Constraints to producing more pigs

- Diseases, lack of extension service, counterfeit/ expired drugs
- Feeds: lack of fresh forage, lack of feed formulas, costly commercial feeds, water
- Housing: affordability of materials for permanent housing
- Market access: exploitation
- Breeds: lack of boars
- Others: theft, predators, lack of knowledge, lack of input capital, “malice”

Reasons for herd exit



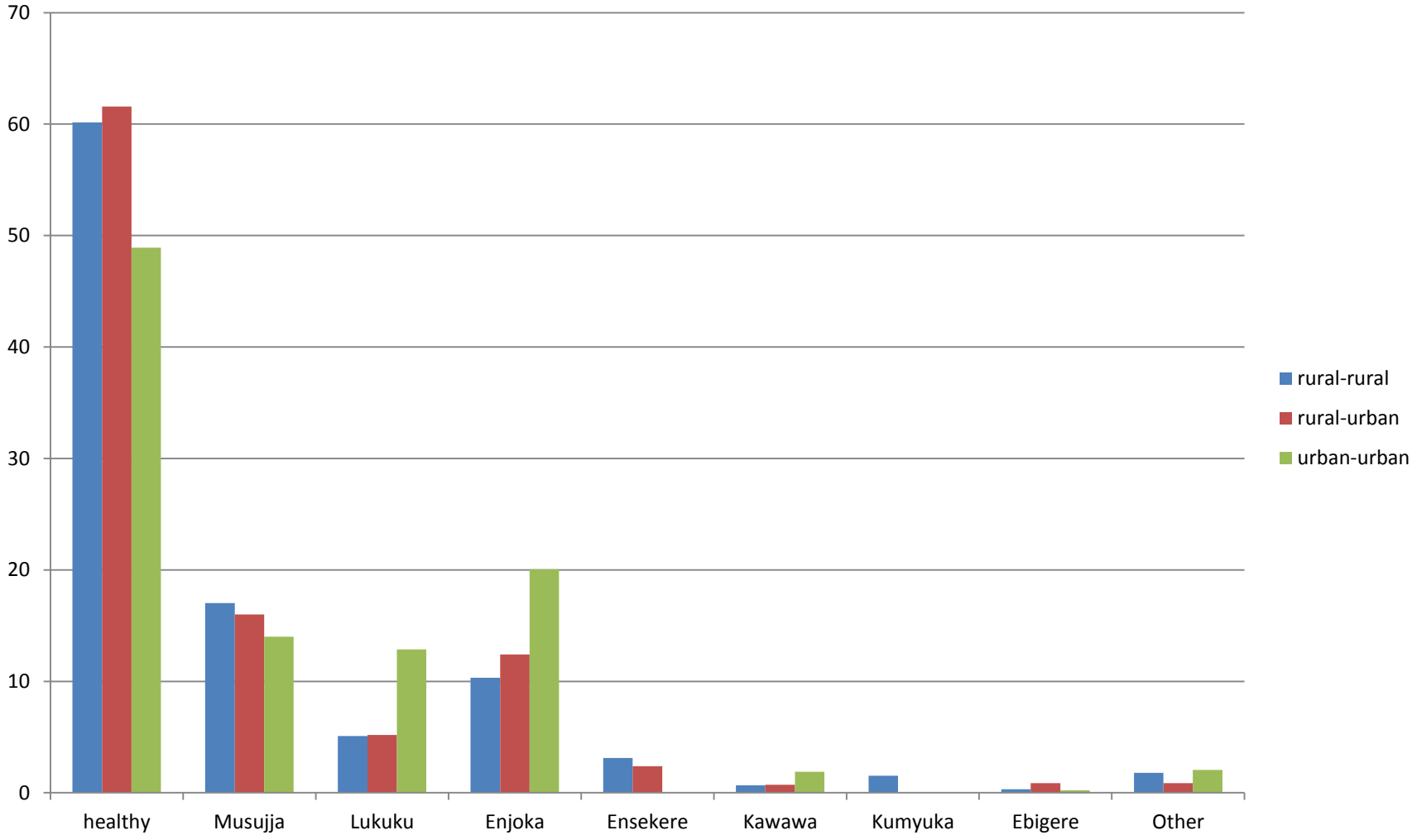
Reasons for death



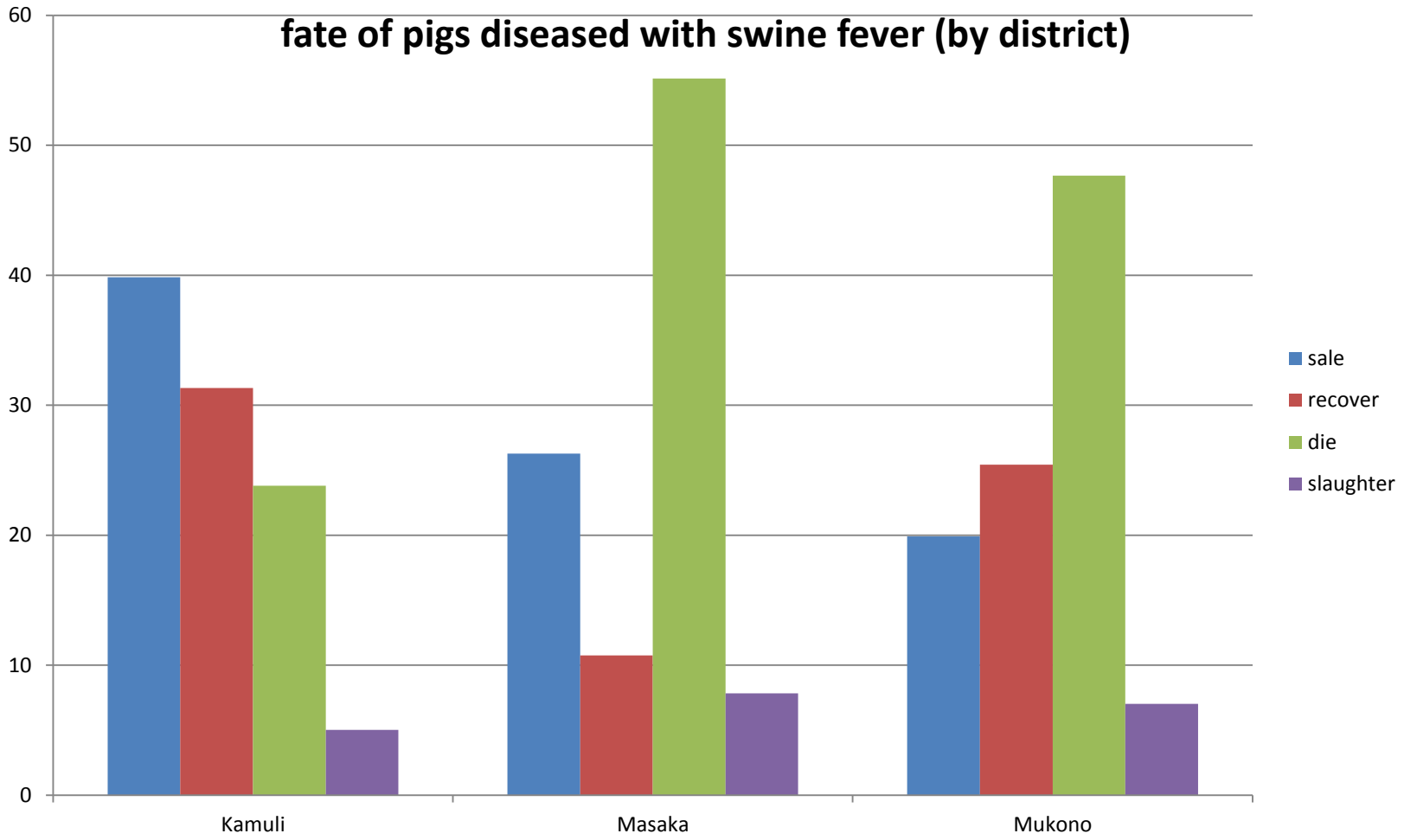
Most common diseases (n=24)

- In all villages:
  - Swine fever (Musujja)
  - Worms (Enjooka)
  - Sarcoptic mange (Lukuku)
- In 10 villages:
  - Lice (Ensekere)
- In 5 villages (Masaka only):
  - Biting flies (Kawawa)
- In 4 villages (Kamuli only):
  - Diamond skin disease (Kumyuka)
- In 4 villages (Masaka only):
  - Foot rot, rotting toe (Ebigere)

disease incidence (n=24 villages)



fate of diseased pigs (n=24)



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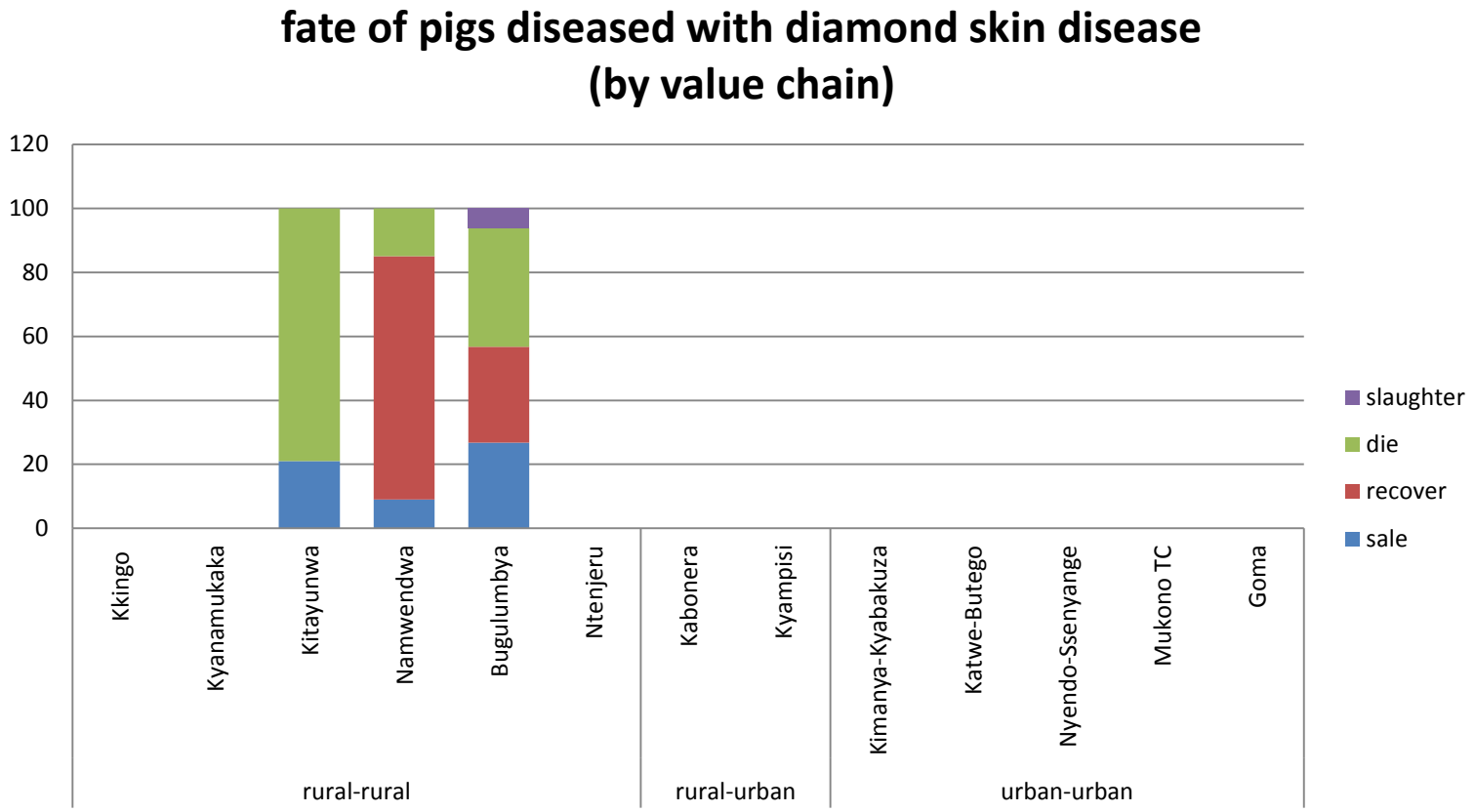
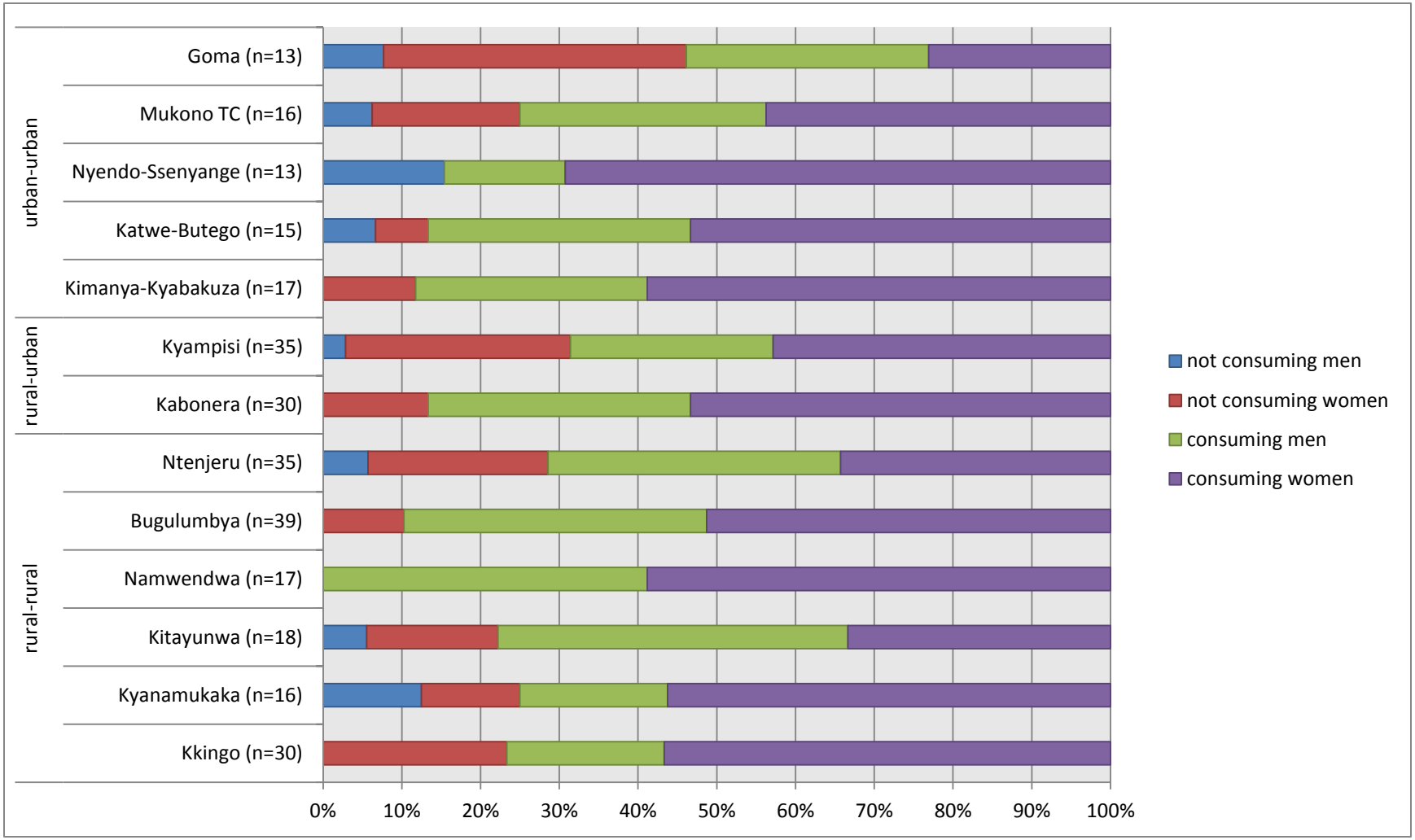
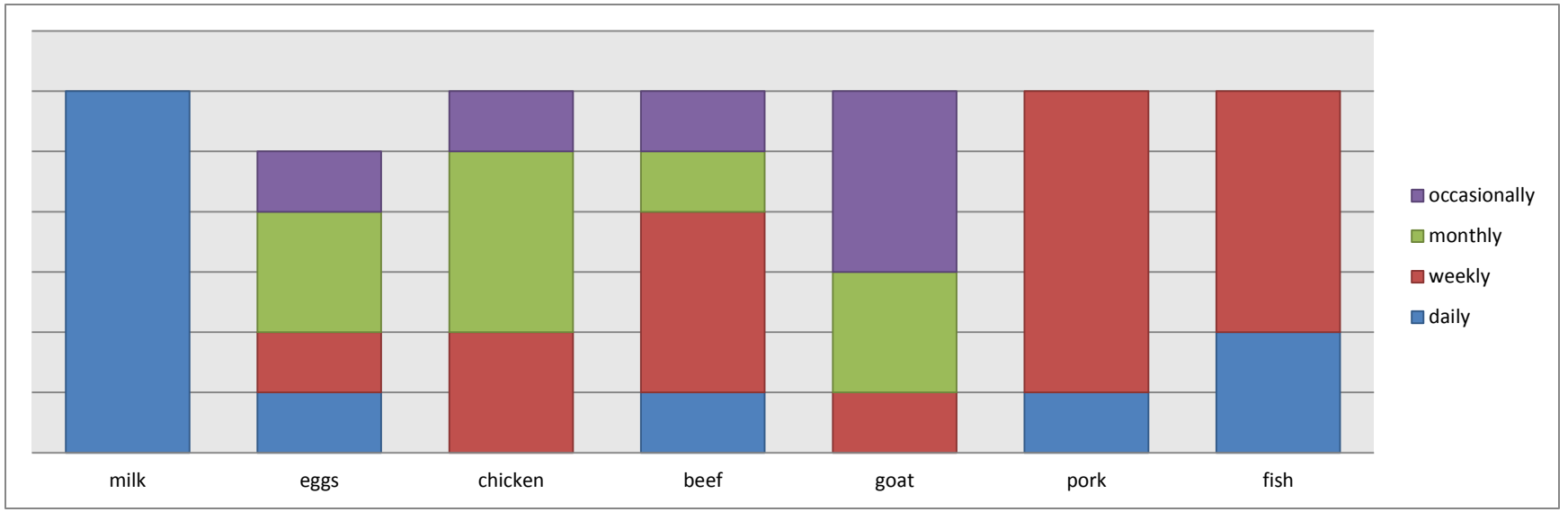
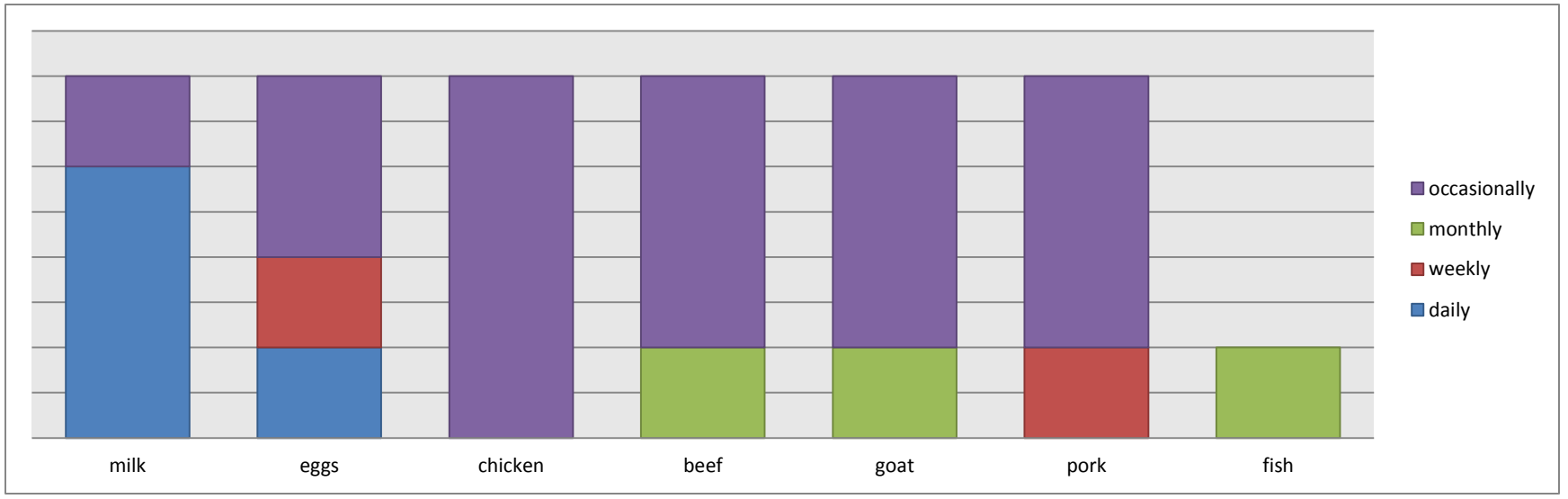


Who eats pigs?



The role of pigs in the diet quality (Mukono vs Kamuli)

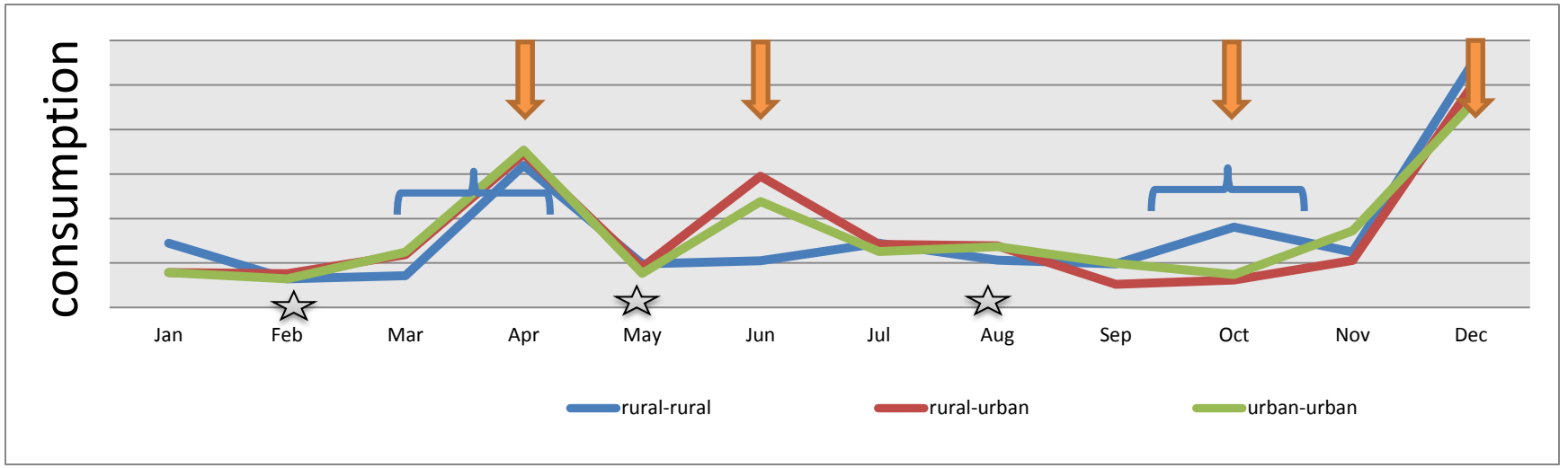


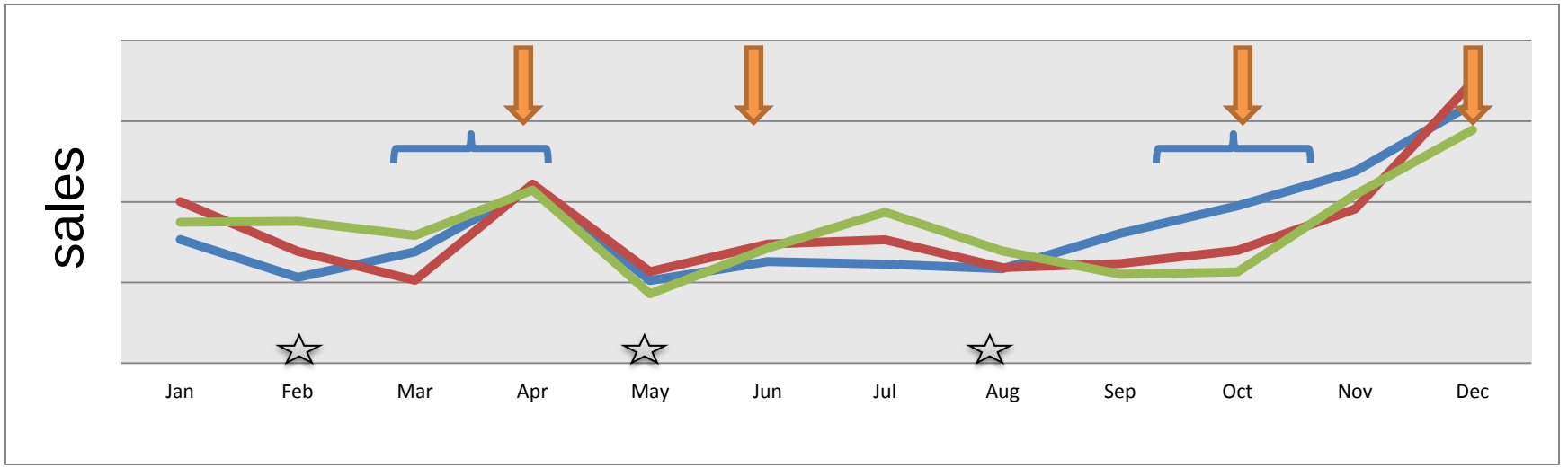


Seasonality of pig consumption?

- Yes, driven by festivals:
  - Christmas
  - Easter
  - Uganda Martyr's Day (June 3)
  - Independence Day (October 9)
- seasonal weather changes:
  - Dry season = season of swine disease outbreaks
- seasonal cash availability:
  - School fees (February, May, August)
  - Coffee/ maize harvest (June, July, November, December)

Drivers of pig consumption





Are pig feeds competing with human food?

- Not in the assessment sites, even though feeds were identified as a major constraint for producing more pigs
- Farmers try and sell stock after fattening them in “times of plenty” (during/ shortly after the rains)
    - kitchen scraps (peels from cassava or potatoes, matooke or posho leftovers)
    - Tubers (Irish potatoes, sweet potatoes, cassava)
    - Fruits (avocado, sweet bananas, jackfruit, mango, papaya)

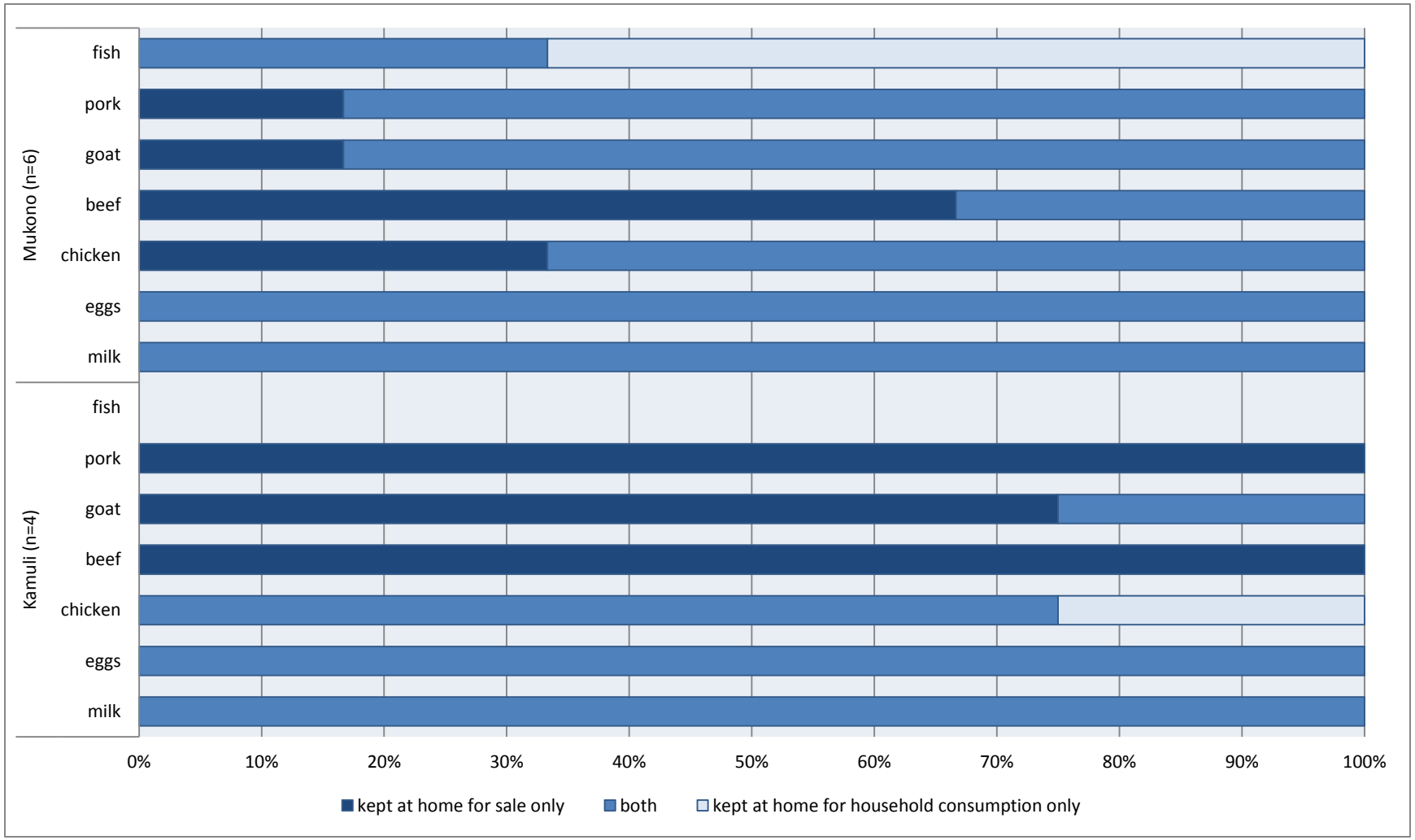
Reasons for eating (more) pig?

- Money: “The rich eat more because they can eat whatever they want whenever they want”
- “eating pork clears the skin” (Mukono)
- “eating pork (and bone marrow) makes strong bones” (Masaka)
- “eating pig cures measles in children caused by eating goats meat” (Kamuli)

Reasons for eating no pig?

- Religion:
  - Muslims; SDA; Borne Again (Masaka): “pigs are for demons”
- Traditional religions:
  - Abaswezi (Kamuli) don’t eat eggplant, fish and pork
  - Abaana Banabawanuka (Kamuli) don’t eat pork
  - Bamasiya (Kamuli) don’t eat anything that produces blood (vegetarians?)
- Beliefs:
  - Pregnant women must not eat pork or “the child might have a mouth like a pig” (Masaka)
  - If children eat meat “they might delay speaking” (Masaka)
  - If children eat offal “they might become dumb” (Masaka)

Accessibility of pig/ pork



Butchery wa Anthony:

- Clean meat and clean butcher man
- Organized place
- Not a pork joint
- Fair price (6,000 UGX per kg)

Butchery Mukono:

- Along the main way
- Clean meat and butcher man
- Organized
- Not a pork joint
- Fair price (6,000 kg UGX per kg)

5km 4 3 2 1 0.5

Butchery/ pork joint Nasuti:

- Relative clean
- Good price
- near

Butchery Mukilangila:

- Dirty meat, dirty butcher man
- Drunkards that maintain obscene words

Butchery/ pork joint industrial area:

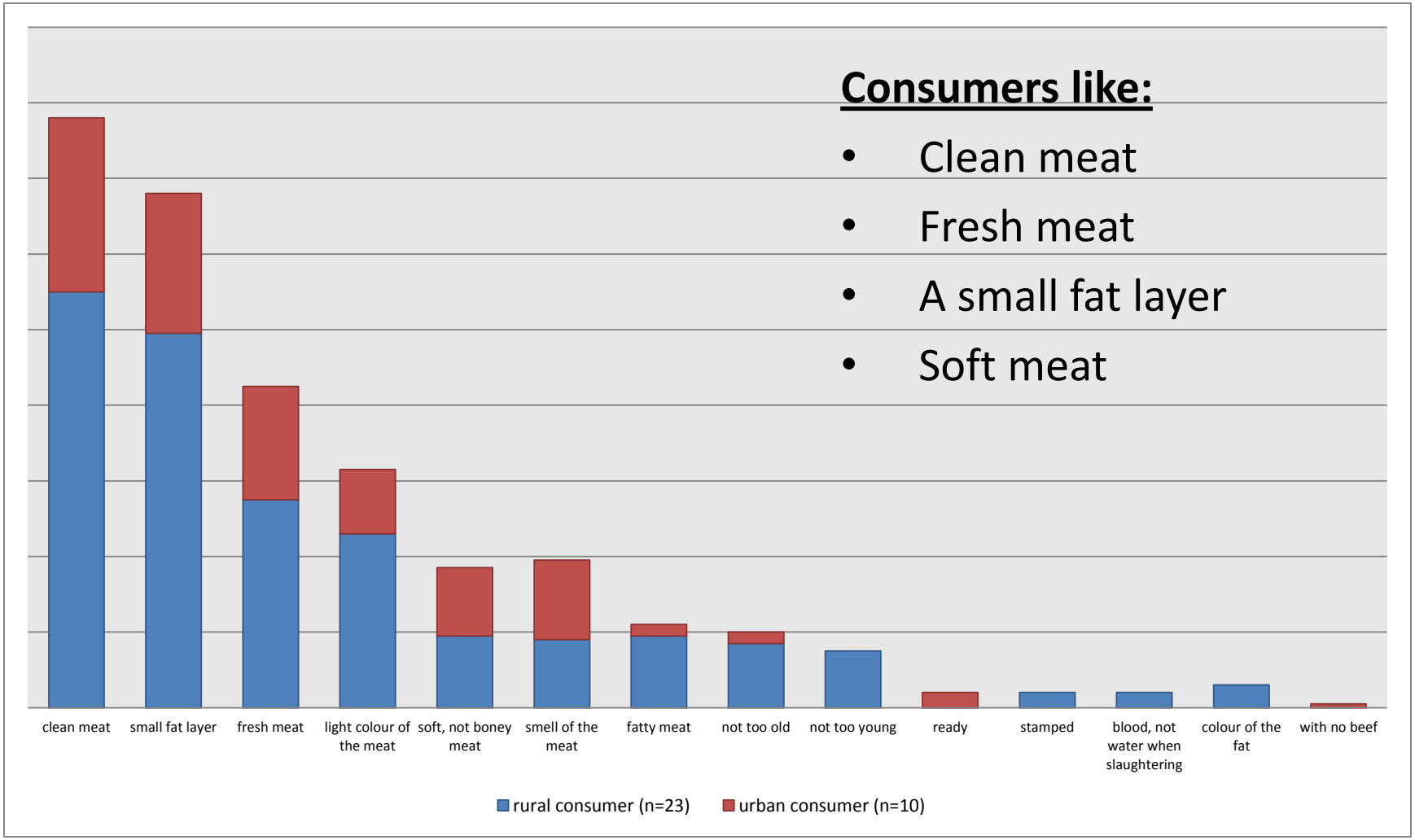
- Relative clean
- Good price
- near

Butchery/ pork joint Nakabago:

- Relative clean
- Good price
- near

Kitete, Mukono TC

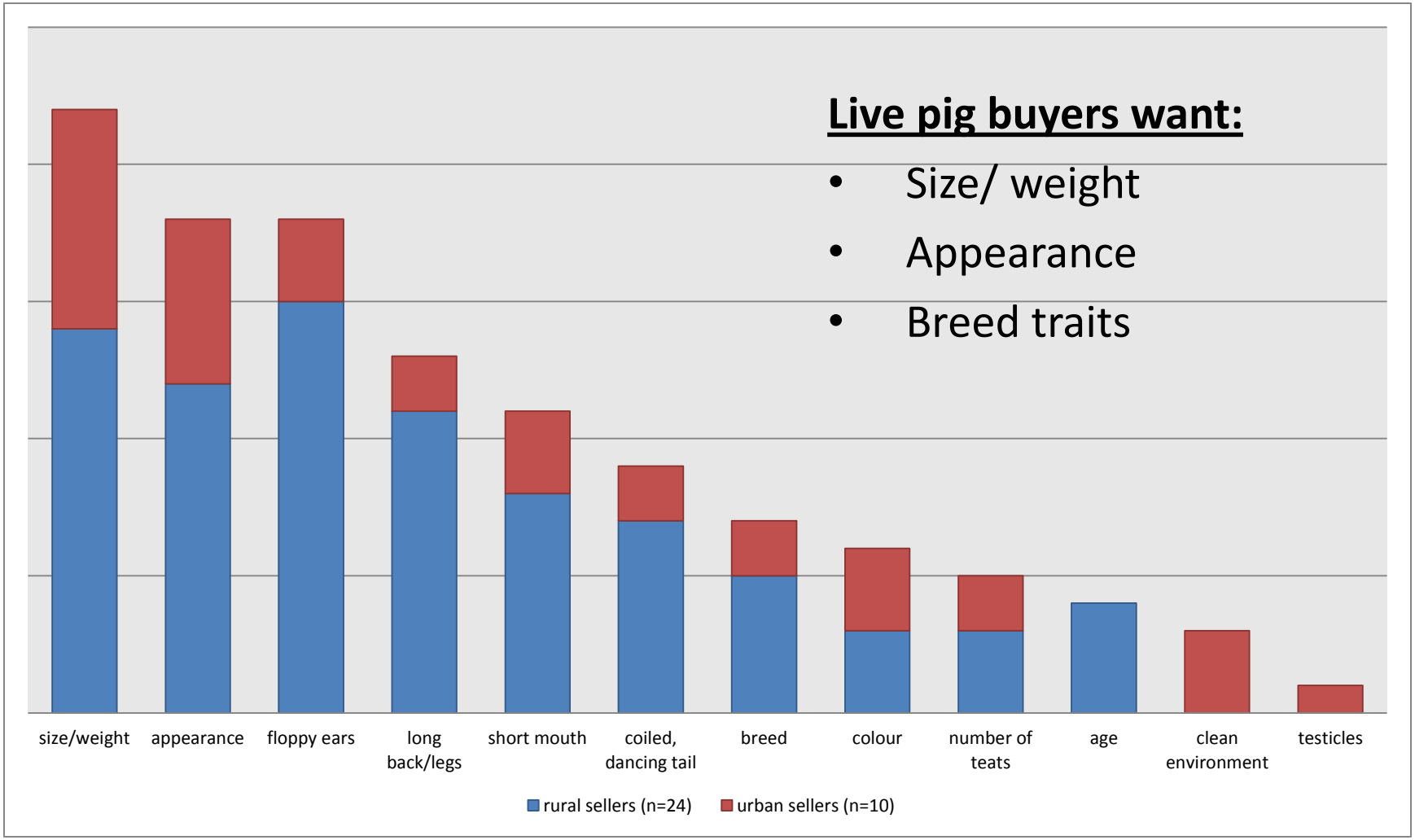
Quality attributes for pork (consumer)



Reasons not to buy pork (consumers):

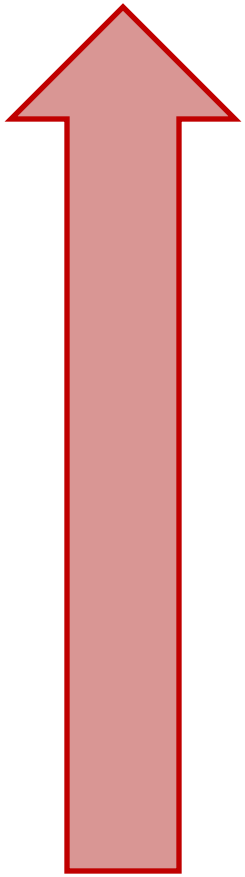
- Meat not clean
- Bad smell of meat
- Reddish/green colour
- Dirty butchers
- No fat/Too much fat
- Pig was too old/too young
- (pork was in the fridge)

Quality attributes for live pigs (traders)



summary: practices increasing the risk for zoonotic diseases

- Misinterpreting signs in live pigs
- Misbeliefs about food
- Sales of pigs in case of a local disease outbreak
- Presence of arthropod vectors
- Lack of on-farm and off-farm disease surveillance exposes slaughter staff, pork handlers including housewives to disease
- Poor feed storage might compromise pork safety
- Some traditional preservation measures
- Eating pork with raw vegetables



summary: practices mitigating risk for zoonotic diseases

- Better slaughter practices in rural sites than in urban slaughter house
- Awareness of diseases transmitted from pigs/pork to people – no raw meat consumption
- Thorough cooking, reheating

1 kg of pork is brought home

6:00 P.M.

Cut into small pieces

6:30 P.M.

Pork into sauce pan, add water, light fire and boil until the water is finished

6:35 P.M.

Fry until the meat turns brown

7:00 P.M.

add ingredients, water and keep cooking

7:20 P.M.

Serve for supper

8:00-9:00 P.M.

Cut into small pieces

6:30 P.M.

Apply salt, put in sauce pan and fry until it turns brown to release the fat

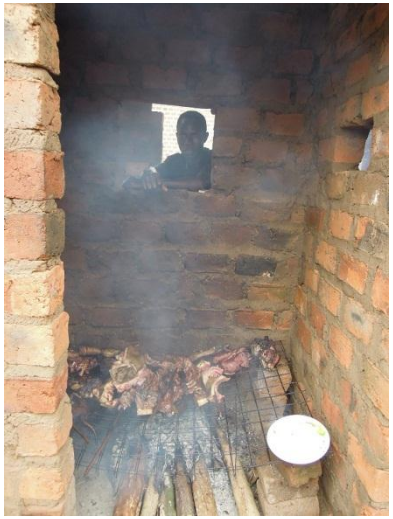
6:35 P.M.

Add ingredients and water and boil

6:55 P.M.

Serve for supper

8:00 P.M.



Some opportunities

- Training of butchers: good slaughtering practices, detection of (zoonotic) diseases for both food safety and disease surveillance
- Develop a meat inspection protocol feasible for the Ugandan context
- Explore possibilities of using traditional medicine for prevention of pig parasites

Complementary studies in Uganda:

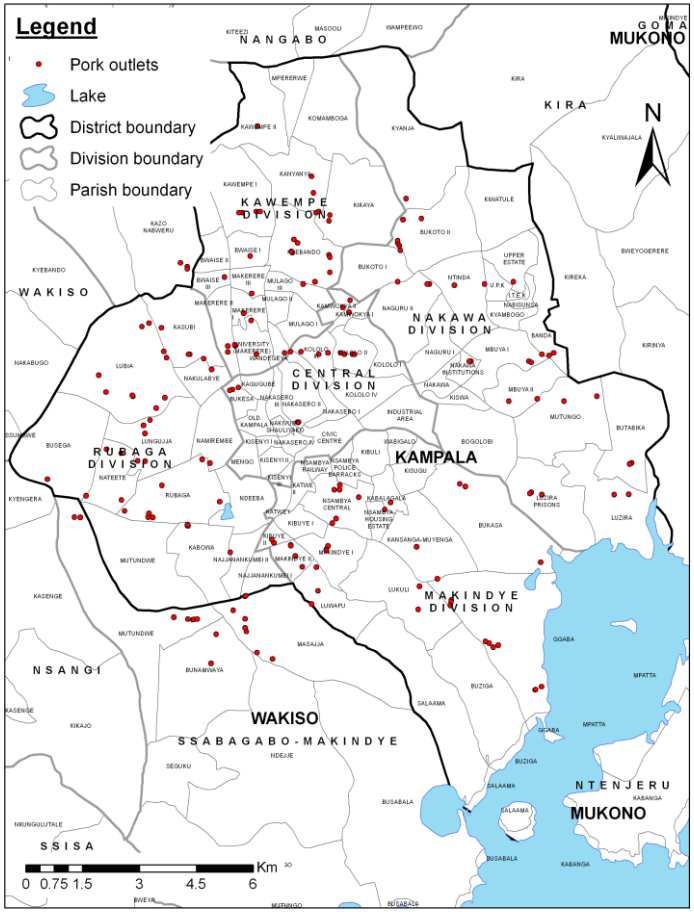
- Descriptive study of slaughter hygiene at only formal slaughter house in Kampala (Kristina)
- Mapping of pork outlets in Kampala and rapid assessment of hygiene (Joseph Kungu and Prof Ejobi)
- Systematic literature review of food safety and zoonotic hazards in the pig value chain in Uganda (Prof Michael Ocaido)
- Ebola Risk Assessment in the Pig Value Chain in Uganda (Christine Atherstone)
- Situational analysis of food safety (on-going, Prof Ejobi)
- 4 postgraduate projects: salmonellosis, brucellosis, Taenia solium, endo- and ecto parasites

Slaughter hygiene at Wambizzi abattoir

1. Origin and destination of pigs and pork
2. Seasonal changes in supply
3. Mapping of slaughter process including times
4. Who does what? Allocation of work force and relationships
5. Who gets what? Flow of products, by-products and cash
6. Knowledge and attitude of stakeholders on pork safety

- FGDs with management and abattoir workers
- Structured questionnaire with the 2 permanent meat inspectors
- Structured observation checklist
- Review of abattoir sales records
- Biological sampling (SFFF student projects from December 2012)
- Kristina Roesel, Katie Holmes (self-funded US vet intern), Joseph Kungu
- Approximately 200 USD spent for feedback workshop to 20 stakeholders
- Presentation of results at AITVM 2013 (accepted for oral presentation)

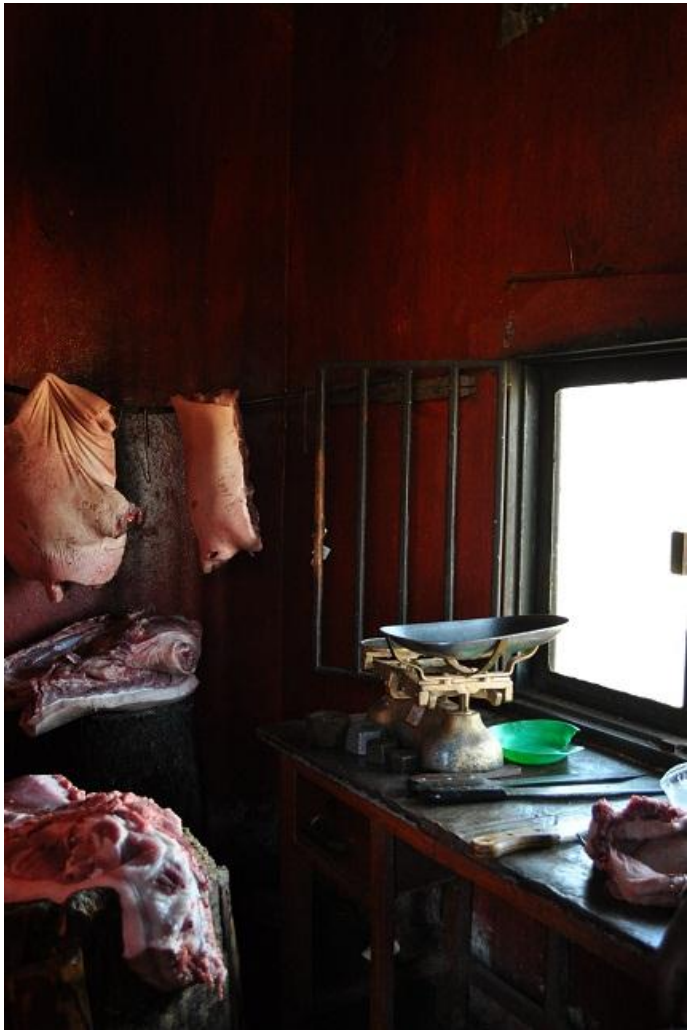
Hygiene practices in pork sales outlets in Kampala (1)



- Joseph Kungu, Francis Ejobi, Patrick Mawadi
- To identify and map pork retail outlets in the 5 divisions of Kampala city: 158 retail outlets identified and geo-referenced
- Distributed uniformly (pork largely consumed)

Hygiene practices in pork sales outlets in Kampala (2)

- Short questionnaire and observation checklist
- Approx. 50% of the pork bought from ungazetted slaughter places (no inspection)
- Basic hygiene requirements are met (source of clean water, use of hot water and sanitizer, cold storage facilities)
- Lack of facilities for blood and waste disposal
- A few butchers had a certificate to allow them meat handling
- Need for training and standards at pork joints
- Need for more gazetted slaughter places to provide inspection



Systematic literature review of food safety and zoonotic hazards in the pig value chain in Uganda

- First ever systematic literature on pig/ pork zoonoses including food borne
- Conducted by consultant: Prof Michael Ocaido, Head of Department of Wildlife and Aquatic Animal Resource, MUK
- March/ April 2013 using the template for a SLR developed under SFFF/RIA
- 82 out of 2838 initial articles reviewed on hazard investigated, year, location, sample size, husbandry type, climate, tests used and prevalence, risk factors, impact and control measures
- Some studies on trypanosomiasis (pigs as reservoirs for HAT), only one study on *Mycobacterium bovis* in pigs and a few on non-tuberculous Mycobacteria in pigs;
- Several prevalence/ risk factor studies on porcine cysticercosis
- Few studies on *Trichuris suis* and *Ascaris suum*
- One study on Ndumu virus (first found in Uganda)

So far no information on:

- *Alaria alata*
- *Ancylostoma* spp.
- Anthrax
- blue pork
- Brucellosis
- Campylobacter
- Coxiella burnetii (Q-fever)
- Cryptosporidium
- ebola
- *toxigenic E. coli*
- Ectoparasites
- *Erysipelothrix rhusiopathiae*
- *Giardia duodenalis*
- hepatitis E
- Influenza
- mycotoxins
- pesticide and vet drug residues
- Rabies
- relapsing fever
- *Salmonella*
- *Sarcocystis suihominis*
- *Streptococcus suis*
- *Taenia hydatigena*
- *Toxoplasma gondii*
- *Trichinella* spp.
- *Y. enterocolitica*
- heavy metals
- Leptospirosis

MSc thesis
"Genetic diversity of antimicrobial resistant Salmonella isolated from pigs carcasses at Wambizzi abattoir in Kampala, Uganda"

- George Morara Tinega (Jomo Kenyatta University)
- August 2012-July 2013
- Field sampling and isolation of Salmonella from 100 meat and faecal samples using conventional culture methods from December 2012-March 2013 at Wambizzi abattoir and MUK
- Biochemical testing (50/100 positives); antimicrobial resistance Salmonella of pork origin by disc diffusion (at MUK)
- Characterization of antimicrobial resistant Salmonella using genetic methods (currently at ILRI-BecA)
- Funding: SFFF-Uganda, CRP4
- Received Borlaug Fellowship for further research in US following the completion of the MSc

PhD thesis
Predisposing factors For *T. solium* cysticercosis along the pig production and marketing value chain in Uganda

- Joseph Kungu (MUK)
- Funding: DAAD full stipend, SFFF, CRP4

Objectives include:

- To characterize the pig production systems and pig market chain in relation to *T. solium* cysticercosis.
- To determine sero-prevalence of *T. solium* cysticercosis in pigs of rural, peri-urban and urban production settings.
- To identify and assess the risks associated with transmission of the disease in pigs and humans.
- To assess knowledge, attitudes and perceptions of pork consumers , handlers and inspectors on pork food safety concerns in relation to *T. solium* cysticercosis.

6 month DAAD post doc fellowship: Survey of brucellosis occurrence in swine in central Uganda

- Joseph Erume, PhD and veterinary microbiologist (MUK); December 2012-May 2013
- Funding: DAAD in region post doc fellowship; SFFF, CRP4

Objectives

- To determine the sero-prevalence of brucellosis in adult swine in central Uganda at slaughter and at farm
- To carry out isolation and bio typing of brucella strains infecting adult pigs

Progress

- 402 serum samples collected from slaughter pigs of which 327 from Masaka, 73 from Kamuli and 2 from Mukono district
- 98 lymph node samples were collected and cultured for brucella
- 15 of the lymph nodes yielded brucella suspect colonies, 8 from Kamuli and 7 from Masaka (there is need to confirm by PCR ---BecA Lab?)
- About 400 serum samples have been collected on farm from Masaka
- Sera will be analyzed as soon as the kits are released from Customs Entebbe

PhD thesis
"Assessment of parasitic burden in the smallholder pig value chain in Uganda and implications for public health"

- Kristina Roesel (FUB/ILRI)
- May 2012-April 2015
- Funding: SFFF, CRP4
- To understand whether parasites are perceived as a production constraint by farmers (participatory methods): yes
- To identify risk factors contributing to parasitic infections in pigs and pork along the respective value chains (PRAs and questionnaires): data collection on-going
- To estimate the parasitic burden in pigs and pork at farm, slaughter and retail outlet level in three selected value chain types in Uganda: on-going
- To assess the risk to public health through the consumption of pork infested with parasites (stochastic modelling): second half 2013
- To develop and test one intervention strategy to reduce the parasitic burden in pigs to increase productivity and to decrease risk to public health: third quarter of 2013