Pig production, *Escherichia coli* and *Salmonellae* infections in Northern and Eastern Uganda: Current situation

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Presentation outline

- Major challenges to pig farming.
- Objectives of the study.
- Methodology.
- Result 1: Characteristics of pig farming.
- Result 2: Enterotoxigenic *E. coli* infections.
- Result 3: *Salmonellae* infections.

Major challenges to pig farming

1. Management practices and diseases.

2. Diarrheal diseases in suckling piglets:

- *E. coli* and *Salmonellae* infections suspected at postmortem.

- These bacteria neither isolated nor characterized.

- Possible management risk factors not known.

- No control measures.

Objectives of the study

- To isolate and characterize *E. coli* and *Salmonellae* from piglets and weaners from Northern and Eastern Uganda.

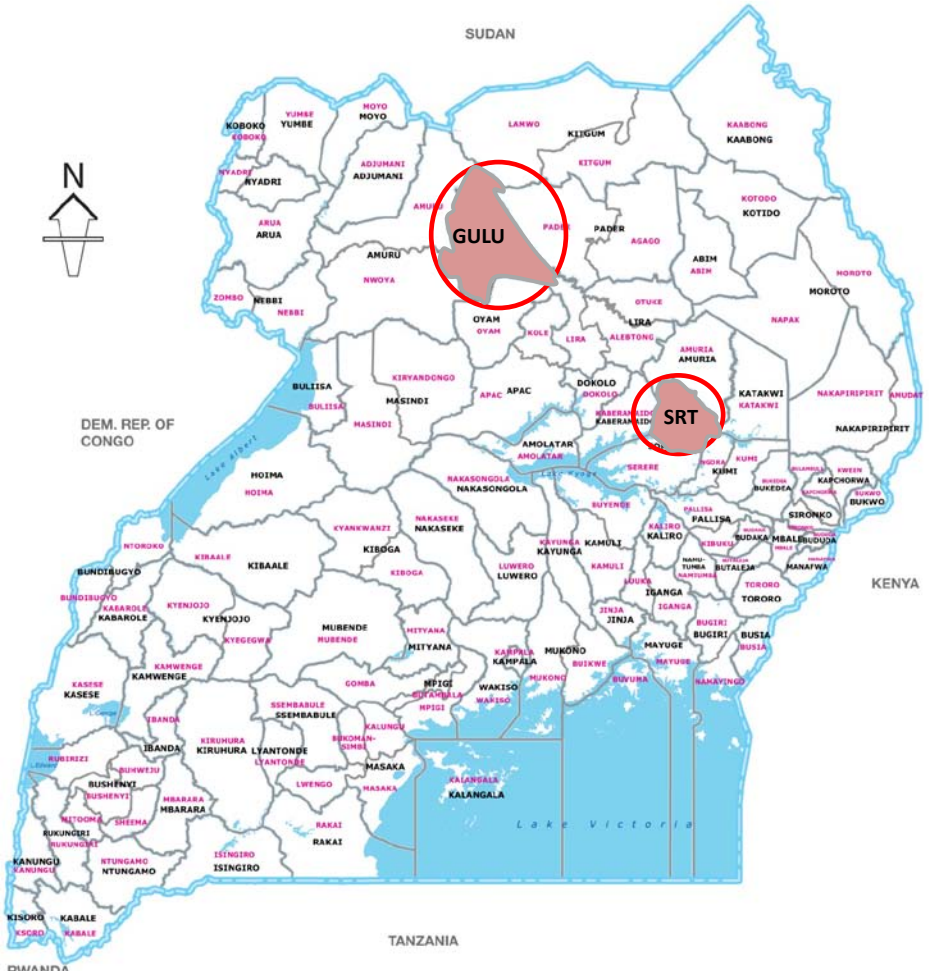
- To determine the prevalence of toxin and adhesin genes (virulence determinants) among *E. coli* strains isolated from piglets and weaners.

Objectives of the study

- To identify and quantify the management risk factors of colibacillosis and salmonellosis.

- To characterize pig production.

Study area


SUDAN
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GULU
SRT
DEM. REP. OF CONGO
KENYA
TANZANIA
Lake Albert
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KOBOKO
YUMBE
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NYADRI
ARUA
AMURU
NWOYA
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MASINDI
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PADER
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NAKASEKE
KYANKWANZI
KIBOGA
KIBAALE
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BUNDIBUGYO
KABAROLE
KYENJOJO
KAMWENGE
KASESE
IBANDA
KIRUHURA
LYANTONDE
RUBIRIZI
BUSHENYI
MBARARA
RUKUNGIRI
KANUNGU
NTUNGAMO
ISINGIRO
KISORO
KABALE
RWANDA
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MITYANA
KAMPALA
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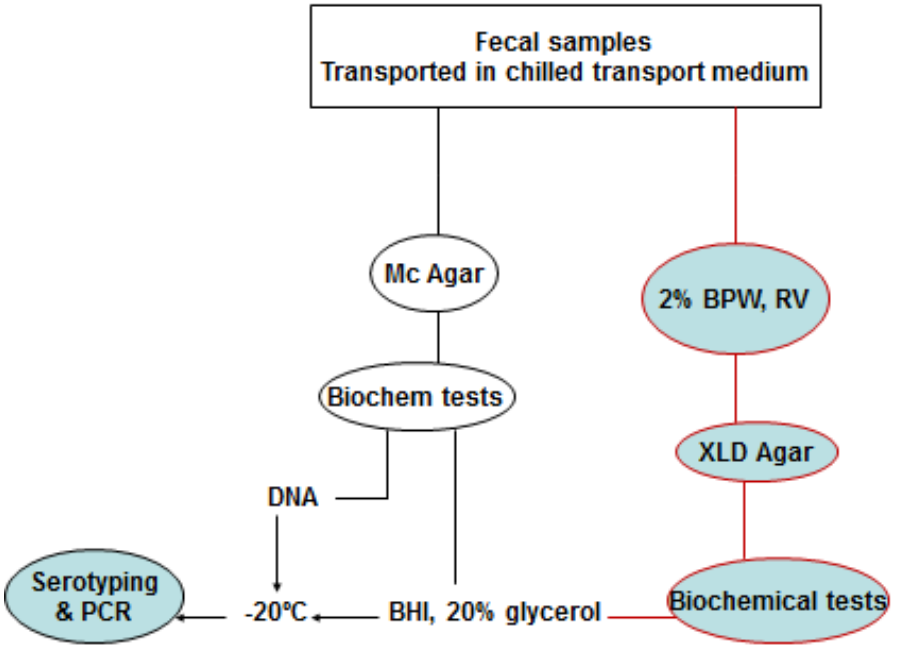
KAMULI
LUWERO
NAKASONGOLA
PALLISA
KALIRO
BUDUDA
MBALE
BUTALEJA
NAMUTUMBA
MANAFWA
SIRONKO
KAPCHORWA
BUKWO
BUKEDEA
TORORO
IGANGA
JINJA
BUGIRI
BUSIA
MAYUGE
NAMAYINGO

Data collection

Field data collection

- Information captured using a questionnaire from 96 HH.
- Questionnaire contained aspects on the demographics of HH heads, pig management and diseases
- Fecal samples collected
- Postmortems done

Laboratory data collection



Result 1: Characteristics of pig farming

Result 1: Common disease symptoms

Variable	No. of households (n=96)	Percentage
Age group with Diarrhea		
Neonates	7	7
Suckling>1 week old	17	18
Weaning	9	9
Adults	3	3
None	60	63
Other clinical signs of disease		
Vomiting	8	8.3
Shaking/trembling	6	6.3
Red patches on the skin	6	6.3
Coughing	22	23
Sneezing	1	1
Loss of appetite	2	2.1
Salivation	1	1
None	50	52.1

Is enterotoxigenic *E. coli* (ETEC) and *Salmonellae* in diarrheic piglets & weaners?

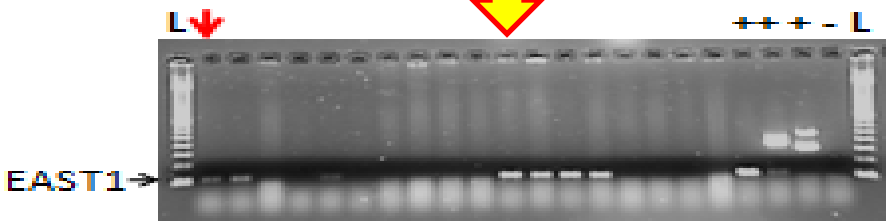
Result 2: Enterotoxigenic *E. coli* infections

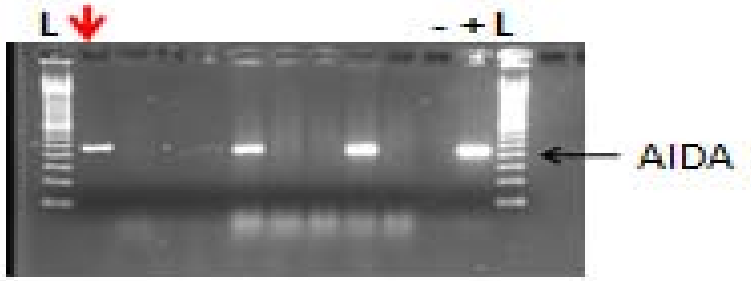
- **Piglets and weaners with diarrhea from 11 households**
- **9 diarrheic with ETEC and 9 non-diarrheic with ETEC**

Toxins: STa, STb and EAST1

Adhesins: Fimbrae 4 (F4) and AIDA

Non-haemolytic ETEC





Result 3: *Salmonellae* infections

- Individual prevalence:

Gulu=12.2%

Soroti=11.9%

Combined=12%

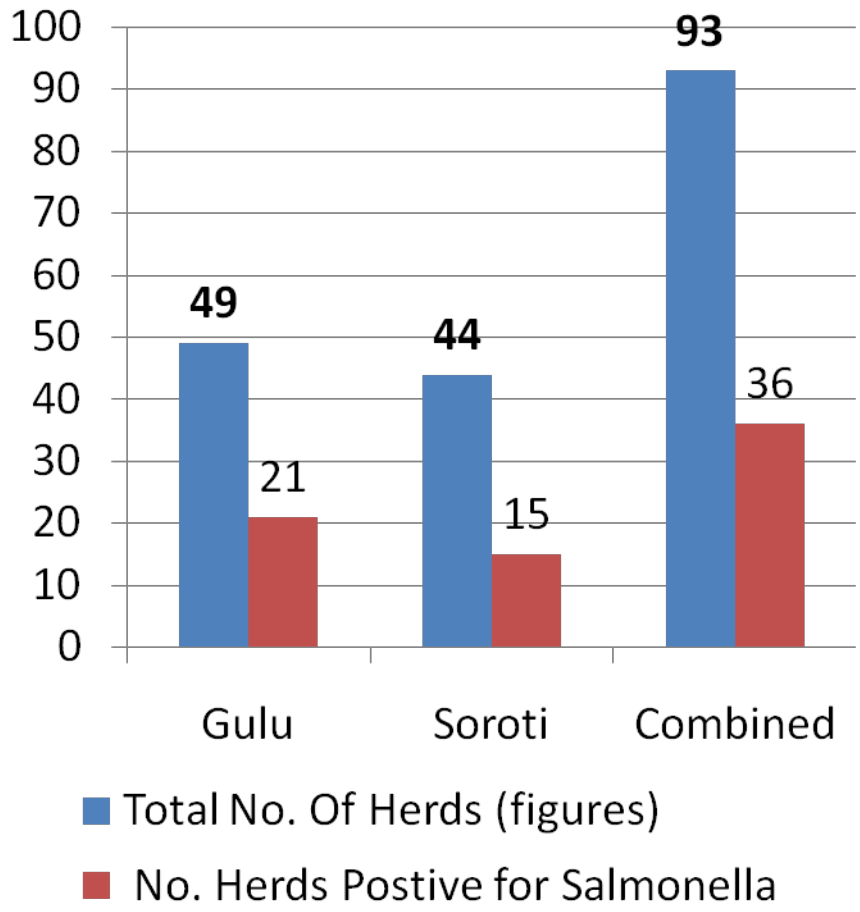
- Herd prevalence:

Gulu = 43%,

Soroti= 34%

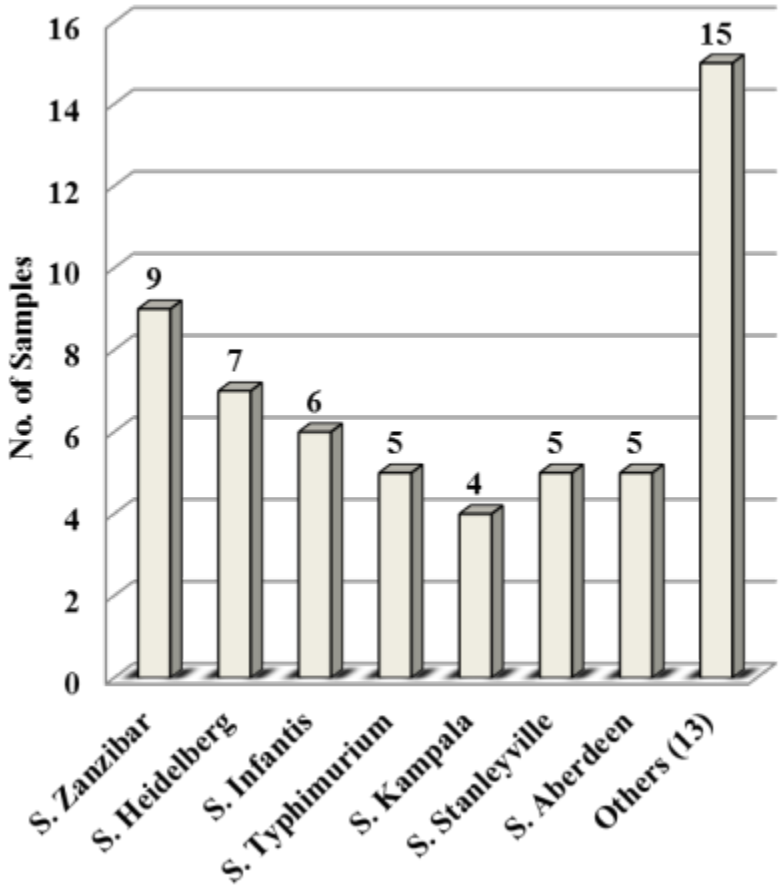
Combined=39%

- 84% of pigs with *Salmonellae* infection were non-diarrheic



Serotypes of *Salmonellae*

- From 56 samples, 20 different serotypes identified.



- 2 isolates identified by number of antigens only i.e.

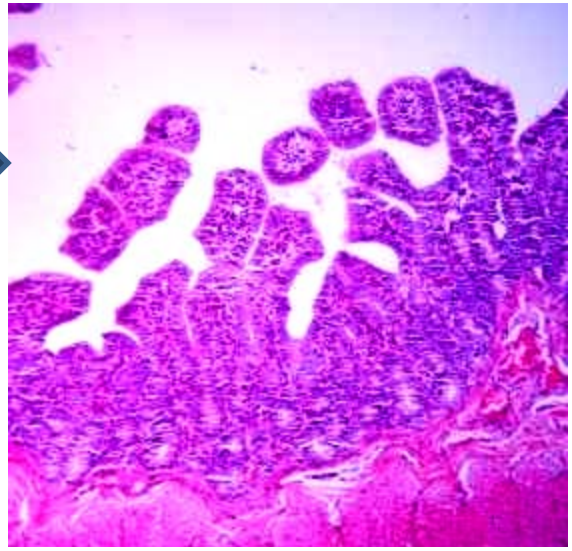
- Antigens=4,5:a:-

- Antigens=4,27:-:z6

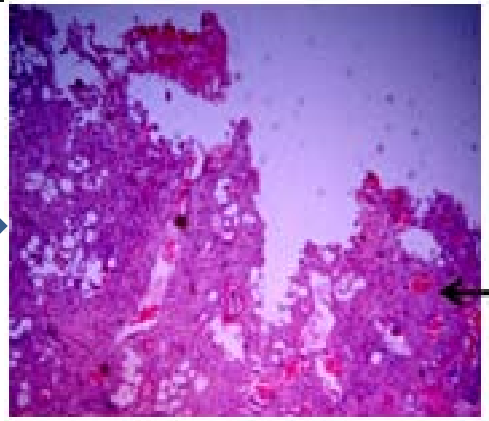
Clinical Salmonellosis

Colon

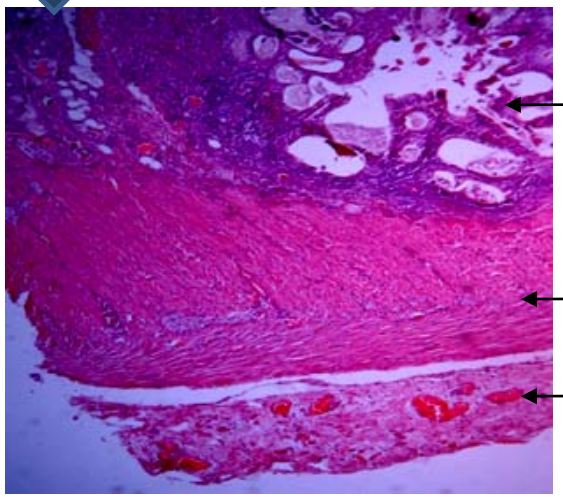
Jejunum



Colon



Colon

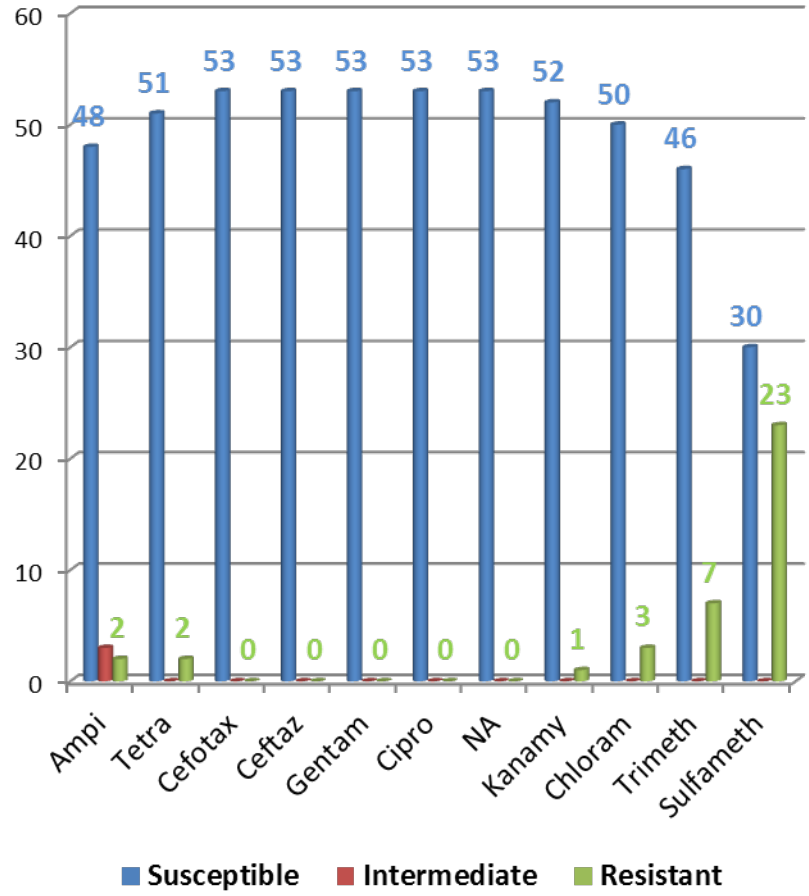


***S.* Typhimurium isolated. Age= 5 weeks**

Drug sensitivity of *Salmonellae*- MIC

- 100% sensitivity to third generation cephalosporins, gentamycin, ciprofloxacin and NA

- Highest resistance to sulfamethoxazole, then trimethoprim.



Protective factors against *Salmonellae* positivity

Variable		Estimate	Standard Error	DF	t Value	Pr > |t|	OR
Group feeding							
No	Yes	1.4601	0.7118	86	2.05	0.0433	4.306
Diarrhea							
No	Yes	-1.1205	0.5919	86	-1.89	0.0617	0.326
Management method							
Intensive	Tether & roam	-2.1927	0.8875	86	-2.47	0.0155	0.112
Intensive	Semi-intensive	-2.1654	1.0815	86	-2	0.0484	0.115
Tether & roam	Semi-intensive	0.0273	0.7596	86	0.04	0.9714	1.028
Cleaning feeders							
≤ 2X week	After every two days	1.4032	0.7157	86	1.96	0.0532	4.068
≤ 2X week	Daily	-0.3043	0.541	86	-0.56	0.5753	0.738
After every two days	Daily	-1.7074	0.7032	86	-2.43	0.0173	0.181

Acknowledgements

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END

Thank you