

ACARICIDE RESISTANCE: UGANDA EXPERIENCE

Regional workshop for OIE National Focal points for Veterinary Products, Swaziland, 6-8 December 2017



Dr. Patrick VUDRIKO
RTC-COVAB and NRCPD

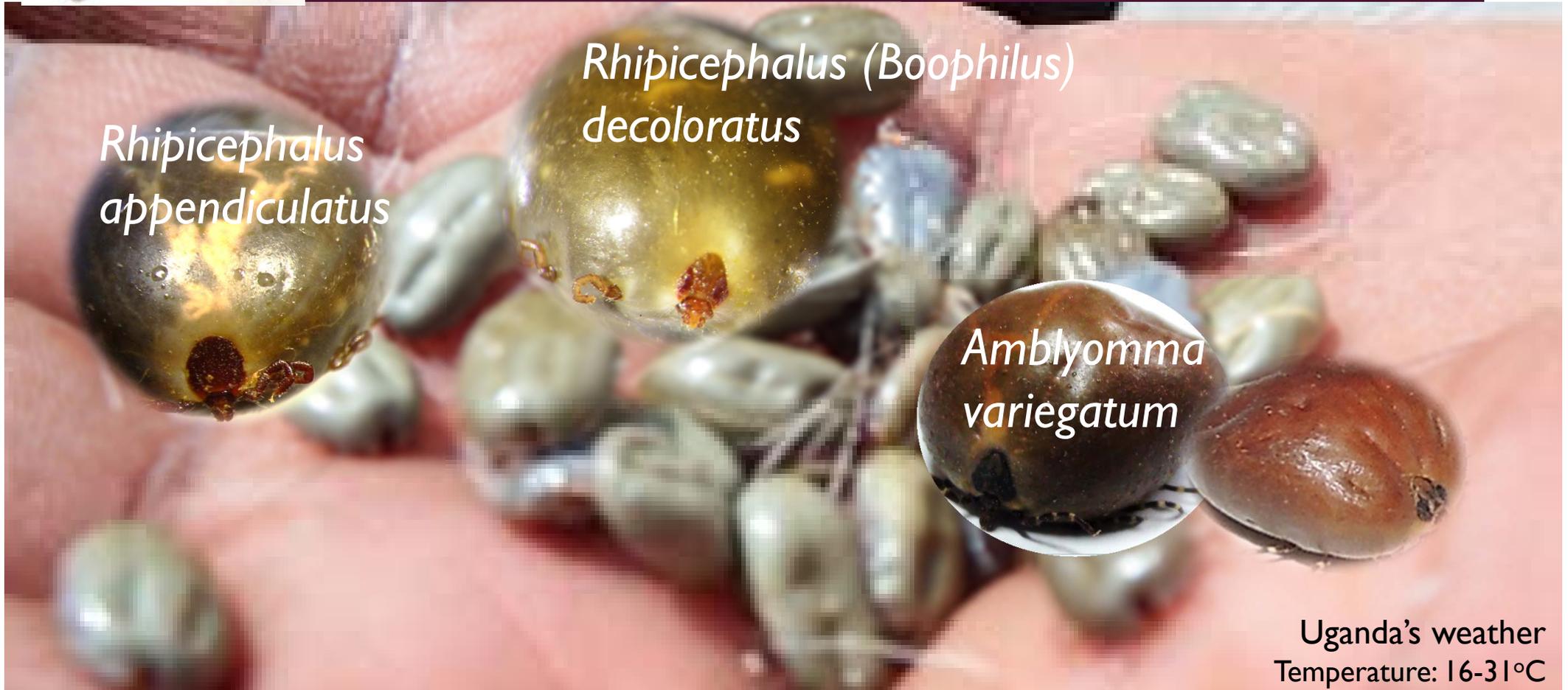


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INTRODUCTION



*Rhipicephalus
appendiculatus*

*Rhipicephalus (Boophilus)
decoloratus*

*Amblyomma
variegatum*

Major ticks in Uganda (Big 3)

Uganda's weather
Temperature: 16-31°C
Rainfall: 1000 -1639 mm
UBOS: 2015)

Ticks: 85.6% disease control cost & 30% calf crop loss (Ocaido et al, 2009)
Impact in Africa is grossly under estimated (Jongejan and Uilenberg, 2004).



Control in Uganda



Native



Crosses 1



Crosses 2

Occasional

7 days

3 days

?



4 classes of acaricides



Photo courtesy: Muhindo

\$26 million spent on importation of acaricides annually (Piper, 2011)



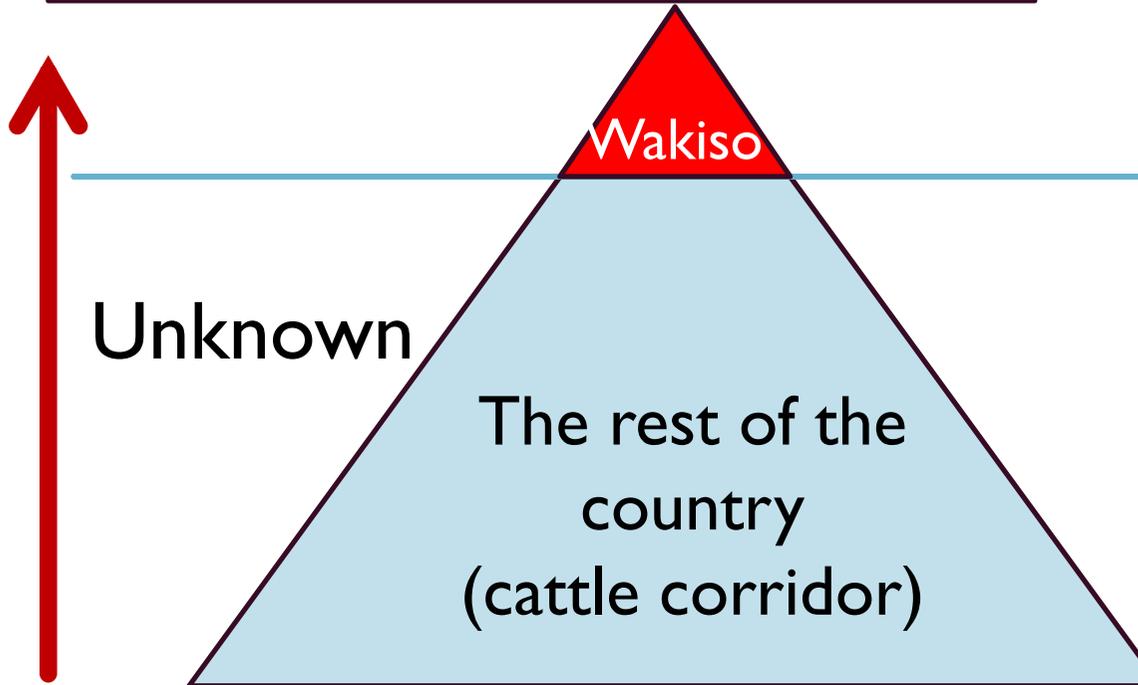
ACARICIDE RESISTANCE IN UGANDA: INITIAL CASE

Acaricide resistant
Rhipicephalus (Boophilus)
decoloratus

2012: First case



Credit: Google maps



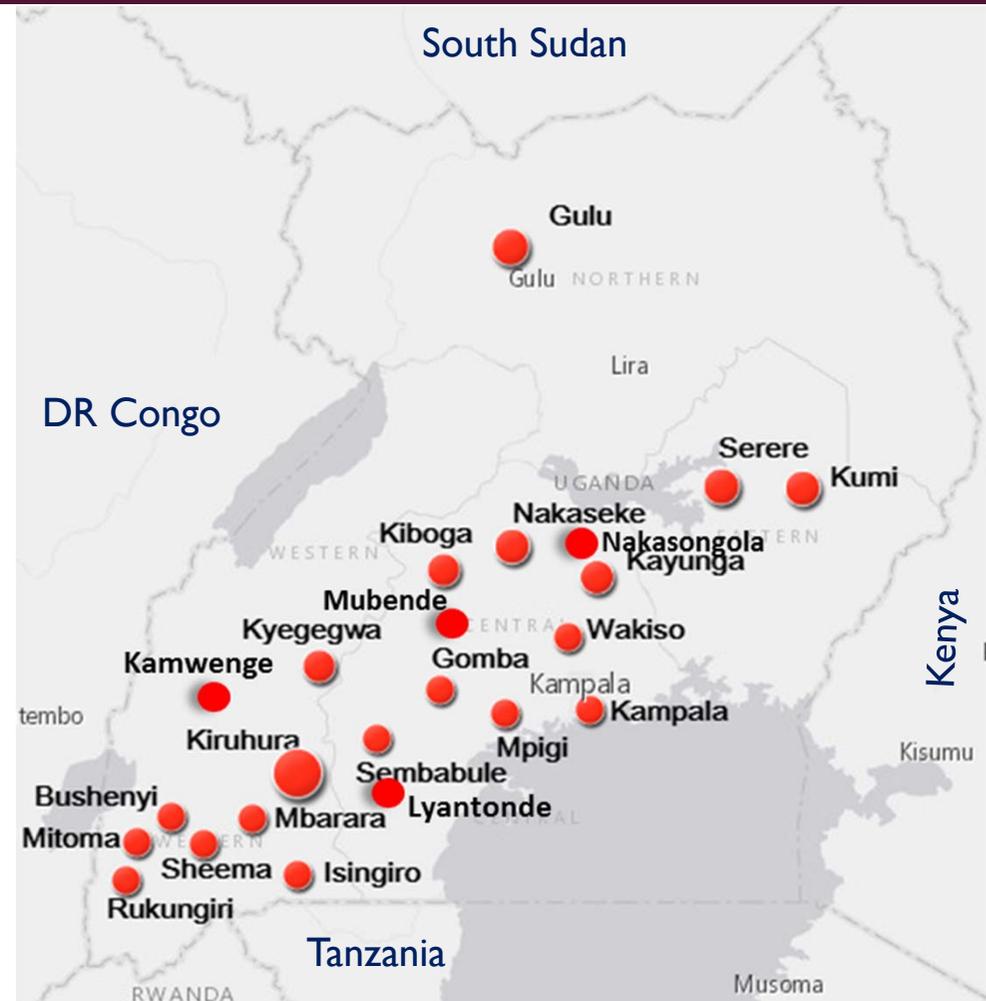
We followed the first case with further investigations



TICK ACARICIDE RESISTANCE IN UGANDA: DISTRIBUTION ACROSS THE COUNTRY



Acaricide resistant *R. (B.) decoloratus* ticks



R. decoloratus (southwest, central & east), *R. appendiculatus* (southwest & central), *A. variegatum* (east & central)



TICK ACARICIDE RESISTANCE IN UGANDA: PRESS REPORTS & E-PRESCRIPTIONS

New Vision
Celebrating 30 years of Excellence

Tuesday, April 11, 2017

Home | News | Business | Sports | Life and style | New Vision TV | Pearl of Africa | Opportunities

Home \ Business \ Acaricide resistance hurting livestock industry, says minister

Acaricide resistance hurting livestock industry, says minister

By Vision Reporter Added 12th July 2014 10:59 AM

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THURSDAY OCTOBER 12 2017

Drug-resistant ticks suck Ankole cattle farmers' hope

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SUNDAY FEBRUARY 19 2017

Livestock farmers battle drug-resistant ticks to boost yields

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TUESDAY DECEMBER 20 2016

Tick-borne disease invades Kiruhura

Facebook Twitter Google+ LinkedIn YouTube

Ssekanjako born added 2 new photos

10 hrs

Ticks and tick borne diseases have hit new high levels with all innovations in modern medical sciences we wonder why the tick continues to be an elusive menace.

“Ticks and TBD have hit a new high levels with all innovations in modern medical sciences”
Dr. Ssekanjako

With disease, how often cows are gonna be wiped out by ticks.
Farmers continue to buy fake drugs pay workers, cows continue to die on a daily of tick borne diseases ... What is happening ...
Ndi munyiru

Like Comment Share

Photo cutesy: Marx

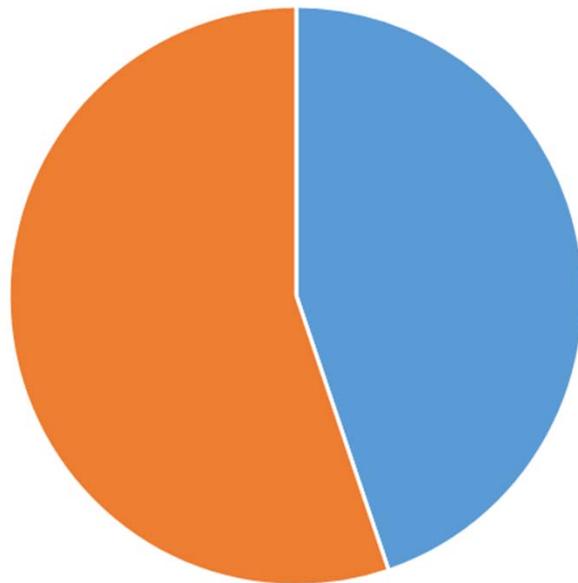
Facebook posts on tick acaricide failure on rise

E-prescription of acaricides is becoming common



ACARICIDE RESISTANCE IN UGANDA: MULTIPLE RESISTANCE IS A REAL THREAT THAT WILL BE COSTLY TO OVERCOME

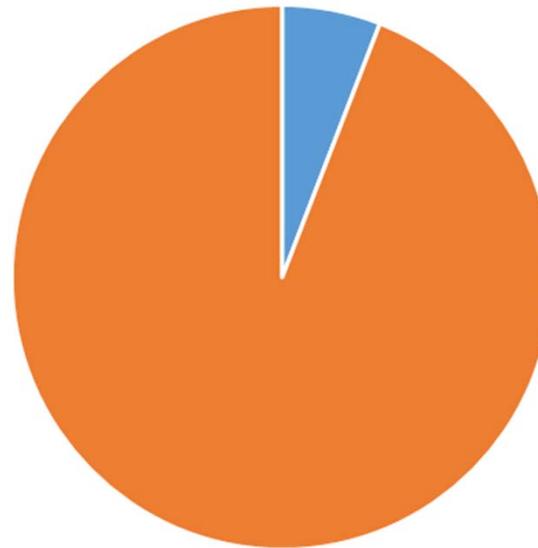
2014/15



■ Single Resistance

■ Multiple Resistance

2016/17



■ Single Resistance

■ Multiple Resistance

NB: Data based on Vudriko *et al*, 2016 and on-going investigation

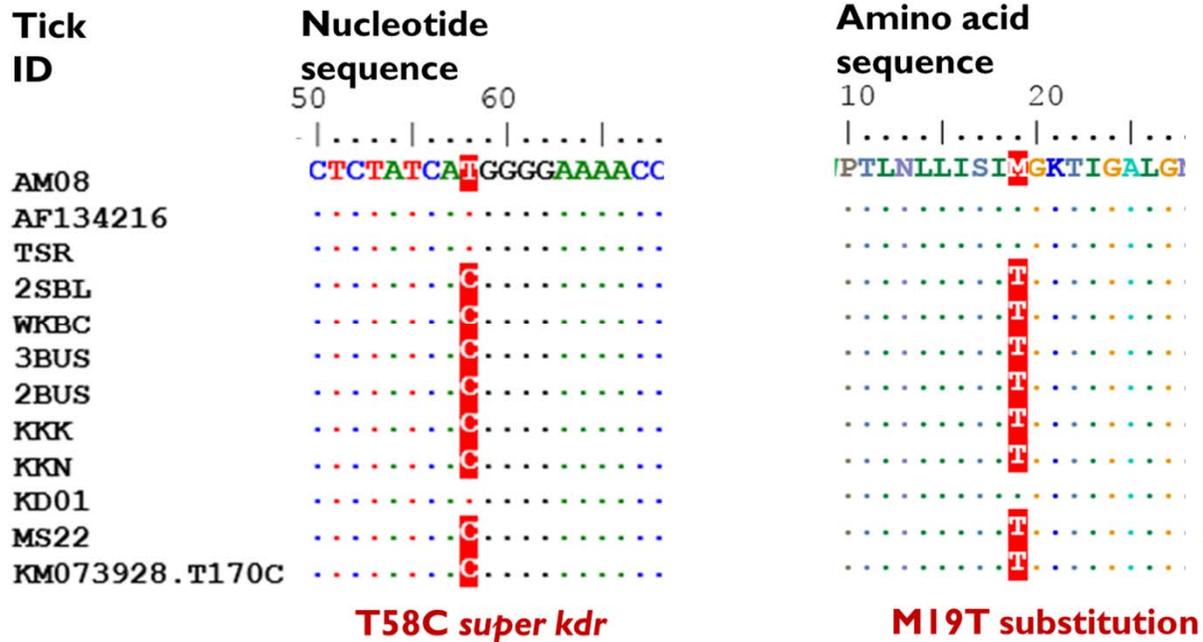
Consequence of multiple resistance

1. Use of concentrated acaricide solution
2. Mixing 3 classes of acaricides
3. Spraying every 3 days
4. Illicit purchase of acaricides from other countries
5. Use of agro-pesticides
6. Irrational use of ivermectin

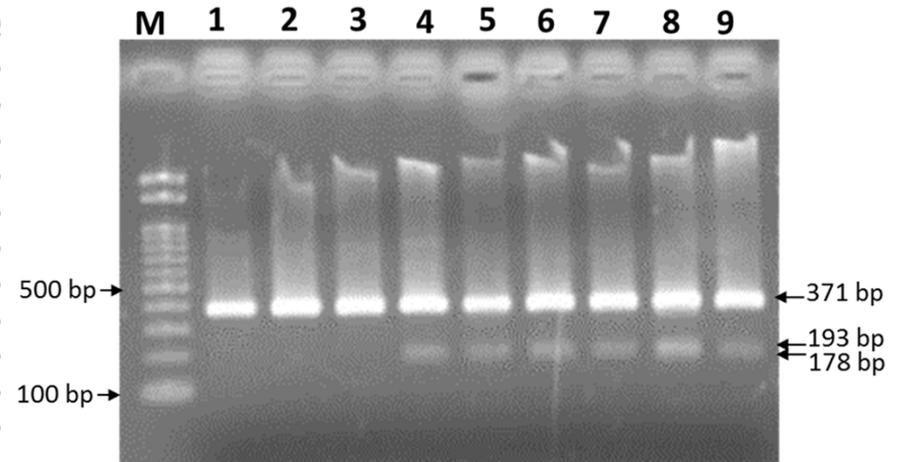
Farms with acaricide failure in southwest & central Uganda are likely to have resistance against 2 or molecules



Synthetic pyrethroid (SP) resistance: Super-knock down resistance in voltage sensitive sodium channel, what is the implication on future of SP?



Rapid diagnostic tests



Vudriko et al, 2017a

How long will it take for the resistance gene to recede?

Reducing time for diagnosis of stable resistance from 4 weeks to 2 day

In progress: genetic makers for rapid detection of amitraz and organophosphate resistance



WHAT POSSIBLY WENT WRONG WITH TICK CONTROL IN UGANDA?



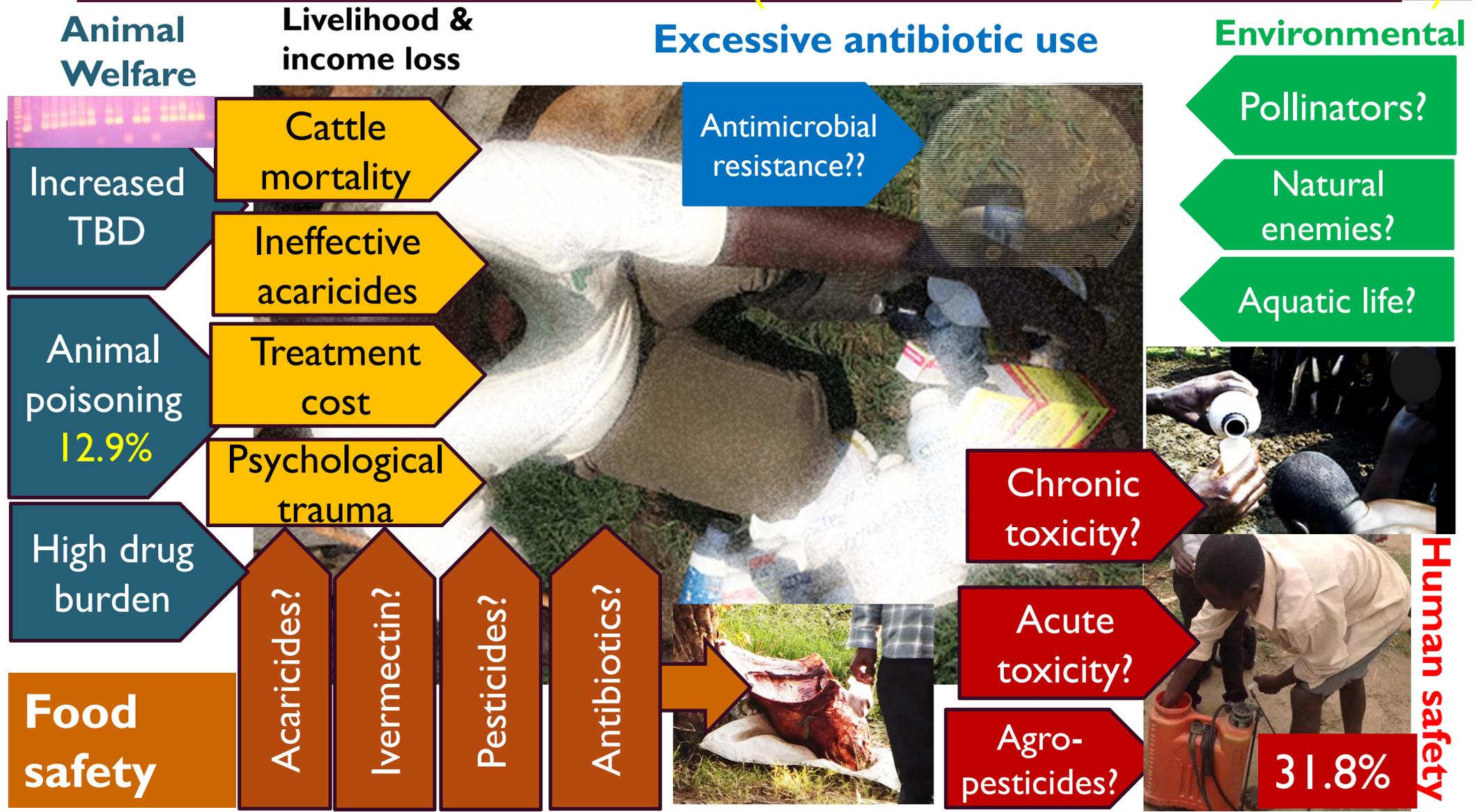
Farm malpractices

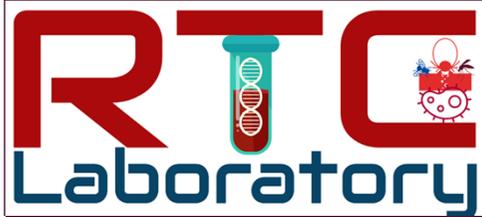


Acaricide regulation & rotation



ACARICIDE RESISTANCE: A COMPLEX CHALLENGE THAT AFFECTS ANIMALS, HUMAN AND ENVIRONMENTAL HEALTH (ONE-HEALTH CONCERN)





SOLUTION 1: BUILDING LABORATORY & HUMAN CAPACITY FOR RESISTANCE DIAGNOSIS & INTERVENTION (RTC LAB)



Established as part of the Evidence-Based Tick Acaricide Control (EBATIC: IT-IE) (Vudriko *et al*, 2017b) with support from JICA in 2015



SOLUTION II: TICK TESTING AND USING RESULT TO INTERVENE (EVIDENCE BASED)

RTC: Tick assay



RTC, NDA community sensitization



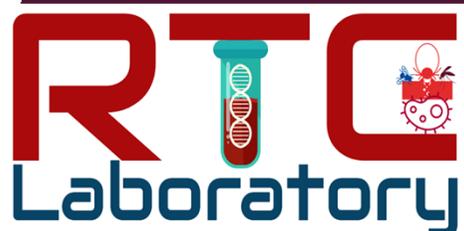
EBATIC stakeholders



RTC, NDA, MAAIF & NaLIRRI joint outreach



RTC Lab supports evidence-based acaricide prescription, intervention & community outreach



SOLUTION III: COLLABORATIVE PARTNERSHIP IN RESEARCH & CAPACITY BUILDING ON TICKS AND TBD RESEARCH AT NRCPD (JAPAN)



Directors of NRCPD and COVAB leaders signing MOU at EBATIC stakeholders workshop in Makerere University



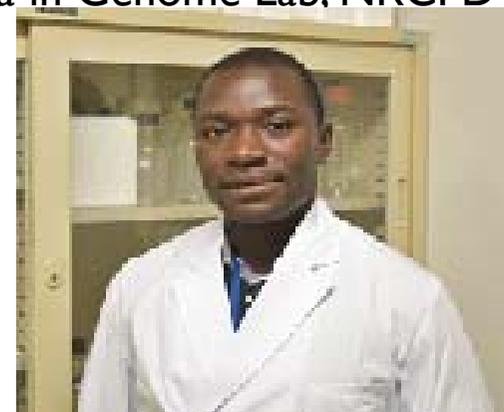
Vudriko P, Asst. R. Umemiya-Shirafuji & Assoc. Prof. T. Hatta in Genome Lab, NRCPD



Tayebwa D (OIE Babesia reference Lab, NRCPD)



Tumwebaze M (Host Defense Lab, NRCPD)



Byamukama B (Host defence Lab, NRCPD)





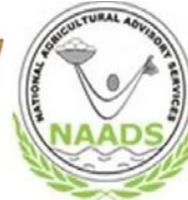
LESSONS, MAJOR THREATS & CALL FOR REGIONAL ACTION

- Multiple acaricide resistance by multi-tick species-complex
- Acaricide resistance: Threat to public health & environment
- National institutional collaboration and private sector involvement
- National standards for tick control facilities & practices
- National acaricide rotation & resistance management strategy
- National ticks & TBD control policy (in-progress in Uganda)
- National acaricide resistance surveillance + EBATIC: IT-IE
- Regional strategy for acaricide licensing
- Regional strategy for acaricide resistance management
- Regional acaricide resistance action working committee
- Regional strategy for prioritization of ticks & TBD control

ACKNOWLEDGEMENT



SAFER PLANET, PROSPEROUS COMMUNITIES



Prof. Hiroshi Suzuki, Prof. Xuenan Xuan, Asst. Prof. Rika Umemiya-Shirafuji, Prof. Kozo Fujisaki, Assoc. Prof. James Acai, Dr. Dickson Tayebwa, Dr. Joseph Byaruhanga, Dr. Robert Omara, Dr. Jeanne B. Muhindo



MAAIF, NDA, COVAB, JICA



RTC Laboratory members

RTC Laboratory: Research for Solution and Information