



Image source Lacasta. Model Christine Mutisya (ILRI).

The challenge

- Need to evaluate the efficacy of rapid test for African swine fever with African isolates.
- Need to evaluate the limit of detection of the evaluated rapid test.

Our innovative approach

Rapid tests evaluated:

- African swine fever virus antigen ASFV Ag rapid test kit from RingBio, China.
- INgezim® ASF CROM Ag from Gold Standard Diagnostics, Spain.
- Celltrix p32 Ag test kit, in collaboration with BioApp, South Korea.
- INgezim® ASF CROM Ag 2.0 from Gold Standard Diagnostics, Spain.
- Celltrix p72 Ag test kit, in collaboration with BioApp, South Korea.

Table 1: Summary results from animals infected with Ken05/Tk1 (genotype X) ASFV strain.

Virus quantity (HAD ₅₀)	Clinical scoring	Assay A	Assay B	Assay C	Assay D	Assay E
Day 0						
Animal 1	1	NEG	NEG	NEG	NEG	NEG
Animal 2	2	NEG	NEG	NEG	NEG	NEG
Animal 3	1	NEG	NEG	NEG	NEG	NEG
Animal 4	1	NEG	NEG	NEG	NEG	NEG
Day 4						
Animal 1	8	NEG	POS	NEG	NEG	NEG
Animal 2	13	POS	POS	NEG	NEG	NEG
Animal 3	13	POS	POS	POS	POS	NEG
Animal 4	12	POS	POS	NEG	POS	NEG
Day 5 (PM)						
Animal 1	18	POS	POS	POS	NEG	NEG
Animal 2	15	POS	POS	POS	NEG	POS
Animal 3	15	POS	POS	NEG	POS	POS
Animal 4	16	POS	POS	NEG	NEG	NEG

Assay name order not same as in the list.

Evaluation of rapid test for the detection of African swine fever virus

- All rapid test can detect all the genotype of ASFV but only assay A and B can detect virus at early days after infection.
- The tests should be evaluated under field conditions.

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2:

Table 1: Summary results from the evaluation of the limit of viral particle detection of the LFAs using four genetically distant ASFV strains.

Virus quantity (HAD ₅₀)	Virus quantity (GEC by qPCR)	Assay A	Assay B	Assay C	Assay D	Assay E
Georgia10 (genotype II)						
1.00E+08	2.25E+08	POS	POS	POS	NEG	POS
1.00E+07	4.69E+07	POS	POS	NEG	NEG	NEG
1.00E+06	5.96E+06	NEG	NEG	NEG	NEG	NEG
1.00E+05	4.94E+05	NEG	NEG	NEG	NEG	NEG
1.00E+04	2.22E+05	NEG	NEG	NEG	NEG	NEG
1.00E+03	1.52E+03	NEG	NEG	NEG	NEG	NEG
1.00E+02	Undetermined	NEG	NEG	NEG	NEG	NEG
1.00E+01	Undetermined	NEG	NEG	NEG	NEG	NEG
1.00E+00	Undetermined	NEG	NEG	NEG	NEG	NEG
Ghana2014 (genotype I)						
1.00E+08	7.84E+08	POS	POS	POS	NEG	POS
1.00E+07	3.53E+07	POS	POS	POS	NEG	NEG
1.00E+06	4.03E+06	NEG	NEG	POS	NEG	NEG
1.00E+05	3.77E+05	NEG	NEG	NEG	NEG	NEG
1.00E+04	2.09E+04	NEG	NEG	NEG	NEG	NEG
1.00E+03	1.34E+03	NEG	NEG	NEG	NEG	NEG
1.00E+02	Undetermined	NEG	NEG	NEG	NEG	NEG
1.00E+01	Undetermined	NEG	NEG	NEG	NEG	NEG
1.00E+00	Undetermined	NEG	NEG	NEG	NEG	NEG
Kenya1033 (genotype IX)						
1.00E+07	4.89E+08	POS	POS	NEG	NEG	POS
1.00E+06	3.61E+07	NEG	NEG	NEG	NEG	NEG
1.00E+05	1.36E+06	NEG	NEG	NEG	NEG	NEG
1.00E+04	3.24E+04	NEG	NEG	NEG	NEG	NEG
1.00E+03	5.69E+03	NEG	NEG	NEG	NEG	NEG
1.00E+02	9.21E+02	NEG	NEG	NEG	NEG	NEG
1.00E+01	Undetermined	NEG	NEG	NEG	NEG	NEG
1.00E+00	Undetermined	NEG	NEG	NEG	NEG	NEG
Ken05/Tk1 (genotype X)						
1.00E+06	1.64E+06	NEG	NEG	NEG	NEG	NEG
1.00E+05	2.05E+05	NEG	NEG	NEG	NEG	NEG
1.00E+04	3.24E+04	NEG	NEG	NEG	NEG	NEG
1.00E+03	1.86E+03	NEG	NEG	NEG	NEG	NEG
1.00E+02	3.70E+02	NEG	NEG	NEG	NEG	NEG
1.00E+01	Undetermined	NEG	NEG	NEG	NEG	NEG
1.00E+00	Undetermined	NEG	NEG	NEG	NEG	NEG

Assay name order not same as in the list.

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Outcomes

- All five lateral flow assays (LFA) can detect all tested African swine fever virus (ASFV): Georgia, Ghana, Ken05/Tk1 and Ken1033.
- The limit of detection is between 10⁷-10⁸ viral particles.
- Assays A and B can detect the infection at early days (day 4) after infection, when animals start showing clinical signs of ASF.
- Assays A and B are the best candidates to take to the field.

Next steps

- Test the feasibility of implementing the rapid tests in the field for rapid diagnostic of ASF.
- Recommend the stakeholders and policy makers on the performance of the rapid tests evaluated.

If you want to know more



Partners



Provided the lateral flow devices free of charge for this research.

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