Food and Agriculture Organization of the United Nations

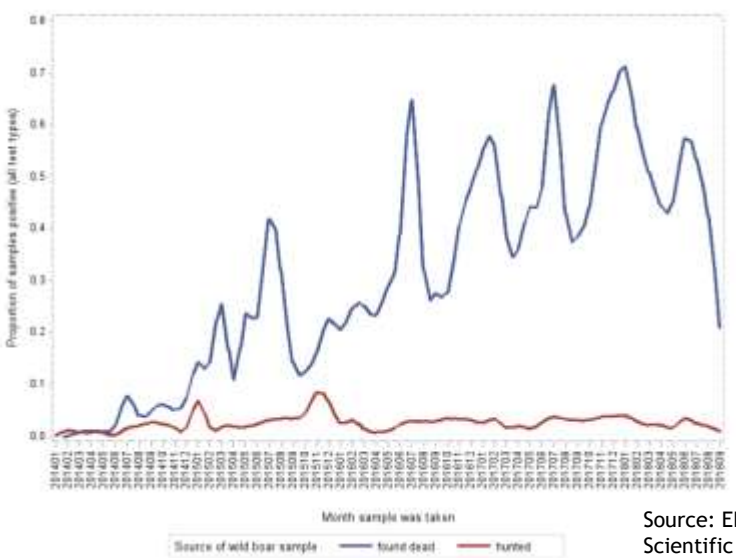
FLI

Alternative sampling and diagnostic tools facing the challenge of wild boar carcasses

Regional African Swine Fever (ASF) Wild Boar Management Workshop
(GCP/RER/060/CHC)
Belgrade, Serbia
21-23 May 2019
Laura Zani

FLI

Why do we need to sample wild boar carcasses?



Source: EFSA Scientific Report 2018

Samples and how to obtain them

What is the optimal sample to find ASFV?

> "Main target cells of ASFV are monocytes and, to a lesser extent, lymphocytes"
>
> (Munoz-Moreno et al. 2015)

✓ high loads of virus/viral DNA:
blood or organ material (spleen or lung)

✗ low loads of virus: faeces, saliva, urine

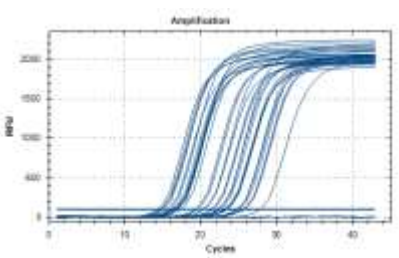
→limited suitability for chewing ropes as passive surveillance tool

Samples and how to obtain them

		0-Wert	1 Monat			2 Monate			3 Monate		
			4°C	20°C	37°C	4°C	20°C	37°C	4°C	20°C	37°C
		cq	cq	cq	cq	cq	cq	cq	cq	cq	cq
Bache 3	Blut	24,78	23,57	26,15	20,94	28,51	25,41	20,58	27,74	25,49	19,97
	Milz	20,09	18,33	30,77	23,43	23,71	25,17	21	20,67	28,12	27,6
	Muskel	25,55	25,94	27,02	25,78	27,53	27,4	29,76	29,26	41,41	27,3
	Kot	34,4	32,95	33,54	34,27	29,26	28,86	31,3	33,62	33,9	33,57
Paula	Blut	27,5	27,8	29,65	26,47	27,66	32,69	29,37	31,07	31,54	27,68
	Milz	21,75	20,41	24,18	27,02	26,17	31,81	28,14	25,27	26,94	27,28
	Muskel	27,39	26,29	28,25	25,88	28,44	32,59	30,11	27,15	32,75	28,41
	Kot	40,32	35,55	42,48	35,46	30,86	31,87	no cq	40,7	37,81	no cq
Hannibal	Blut	22,55	24,09	21,16	18	28,06	26,33	20,72	27,75	24,27	18,66
	Milz	18,85	18,62	18,93	27,52	28,45	29,31	20,46	19,85	19,78	24,28
	Muskel	26,05	25,65	27,63	22,94	26,9	26,05	27,47	28,6	24,45	25,19
	Kot	40,44	36,38	no ct	30,9	32,19	30,33	31,45	42,24	38,8	41,74

„Sample too bad" is not a good excuse…

…at least not for most PCR applications…



Our colleagues in the Estonian Reference Lab reported „creative sampling strategies“

→ Hunters have to sample each hunted wild boar in infected areas

Tools for simplified surveillance

- for early disease detection, effective surveillance measures are indispensable
- swab sampling already showed good performance in previous studies (Petrov et al. 2014; Blome et al. 2014) as simplified surveillance tools for hunters and foresters

ORIGINAL ARTICLE

WILEY

Simplifying sampling for African swine fever surveillance: Assessment of antibody and pathogen detection from blood swabs

J. Carlson[1] | L. Zani[1] | T. Schwaiger[1] | I. Nurmoja[2,3] | A. Viltrop[2] | A. Vilem[2] | M. Beer[1] | S. Blome[1]

Tools for simplified surveillance

- Genotubes/dry swabs are dipped in blood, bloody liquid or swabbed on carcass surfaces

Workflow:

antibody detection

virus detection

→ Suitable even for challenging sampling scenarios

The challenge of sampling carcasses

- cumbersome if carcasses are already decomposed
- high risk of contamination if more than one animal is sampled
- alternative sampling tools can help to facilitate the sampling procedure and increase passive surveillance

The challenge of carcass sampling

- if the cadaver is severly decomposed or eaten by other animals

→ bone marrow samples taken for routine diagnostic

The challenge of carcass sampling

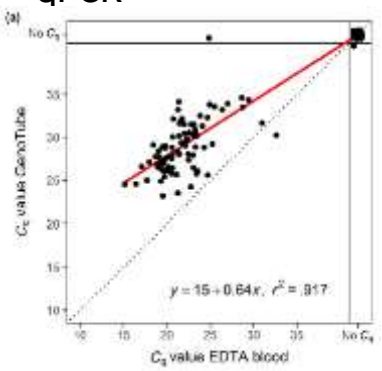
- challenging to sample at -15°C
- severly decomposed or eaten by other animals
- bone marrow samples taken for routine diagnostic

carcass no. 1

carcass no. 2

Results of trial samples

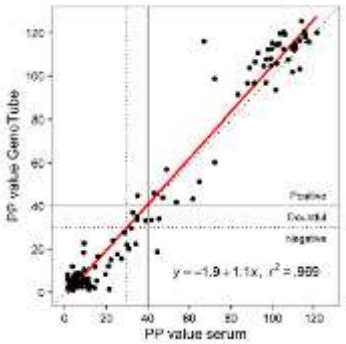
- qPCR



- sensitivity: 98.8 % [93.4;100.0]
- specificity: 98.1 % [90.1;100.0]

→ slightly lower genome loads in Genotubes

- ELISA:



- sensitivity: 93.1% [83.3, 98.1]
- specificity: 100% [95.9,100.0]

Alternative Diagnostic tools

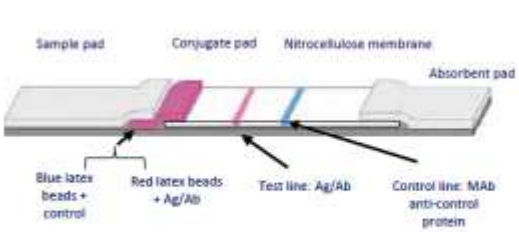
Lateral flow devices

→ Detection of viral particles/antibodies

+ Does not require trained personnel or lab facilities

+ No cooling or electricity required

Problem: Who should run these tests?



Thank you for your attention!