

# Typing of *Coxiella burnetii* ; Why is Q-fever causing problems in the Netherlands?

Hendrik-Jan Roest, DVM  
Department of Bacteriology and TSEs  
Central Veterinary Institute of Wageningen UR  
Lelystad, the Netherlands



# MLVA typing of *C. burnetii* from goats

## Goat farms

- 251 PCR positive samples van 17 dairy and pet farms
- 2008, 2009
- Vaginal swabs, organs
- MLVA, Arricau 2006
  - 12 loci

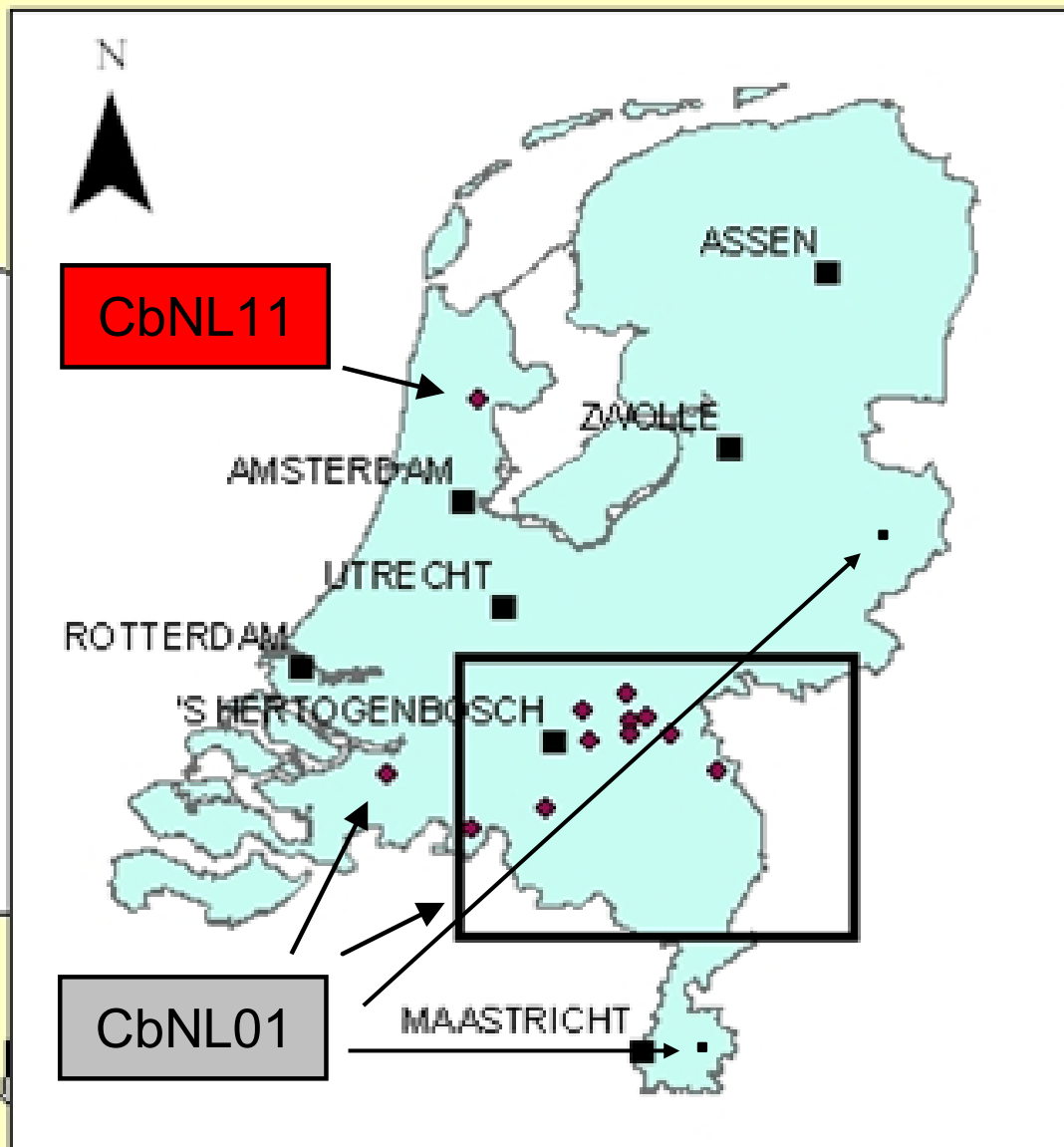


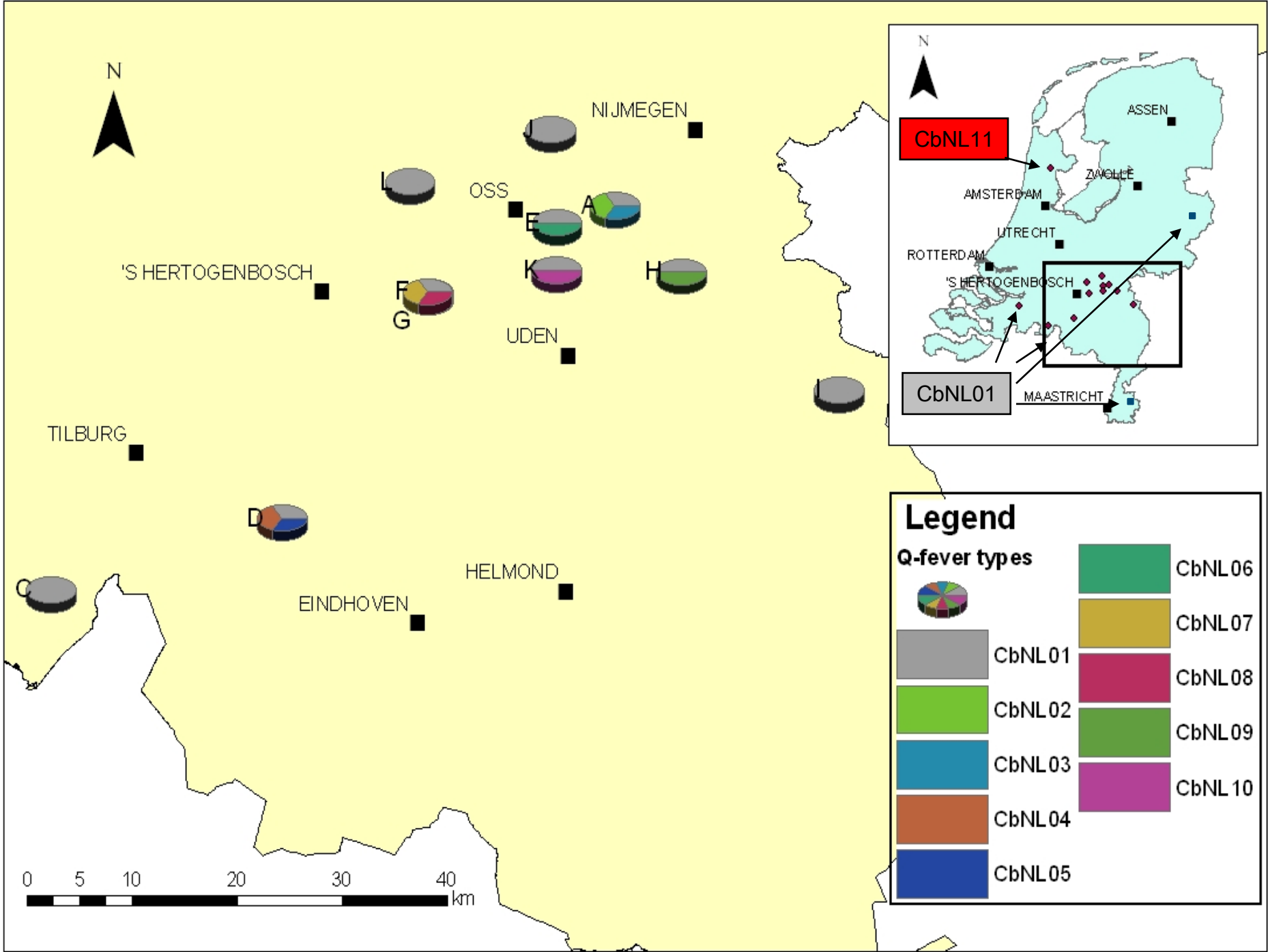
farm ID	province	year	symptom	species	# samples
A	Noord Brabant	2008	abortion	goat	20
B	Noord Brabant	2008	abortion	goat	20
C	Noord Brabant	2008	abortion	goat	20
D	Noord Brabant	2008	abortion	goat	39
E	Noord Brabant	2007	abortion	goat	3
F	Noord Brabant	2008	abortion	goat	16
G	Noord Brabant	2008	abortion	goat	4
H	Noord Brabant	2008	abortion	goat	13
I	Noord Brabant	2008	?	goat	1
J	Noord Brabant	2008	?	goat	3
K	Noord Brabant	2008	no symptoms	goat	2
L	Noord Brabant	2008	abortion	goat	3
M	Noord Holland	2008	no symptoms	goat	2
N	Overijssel	2009	abortion	goat	20
O	Limburg	2009	abortion	goat	40
P	Noord Brabant	2009	abortion	goat	20
Q	Noord Brabant	2009	abortion	goat	25
17					251



locus ID	CbNL 01	CbNL 02	CbNL 03	CbNL 04	CbNL 05	CbNL 06	CbNL 07	CbNL 08*	CbNL 09	CbNL 10	CbNL 11	CbNL 12	CbNL 13
ms03	7	7	7	7	7	7	-1	7	7	7	7	7	-1
ms12	7	7	-1	-1	-1	-1	-1	-1	-1	-1	7	-1	-1
ms21	6	6	6	6	6	6	-1	-1	6	6	6	6	6
ms22	6	6	8	6	6	-1	-1	6	6	-1	6	6	7
ms30	6	4	6	9	0,5	6	-1	-1	6	-1	6	6	-1
ms36	12	12	12	-1	12	1	-1	-1	7	7	12	9	-1
ms27	3	3	-1	3	3	3	-1	-1	3	-1	2	3	-1
ms28	3	3	3	3	-1	3	-1	-1	3	12	3	6	-1
ms31	2	2	2	-1	-1	2	7	-1	2	2	2	-1	-1
ms34	6	6	6	6	6	6	6	4	6	6	2	6	6
ms24	10	10	10+22	10	10	10	-1	-1	10	-1	-1	10	-1
ms23	8											8	8
	238	2	1	1	1	1	1	2	1	1	2	1	1







'S HERTOGENBOSCH

NIJMEGEN

OSS

CbNL11

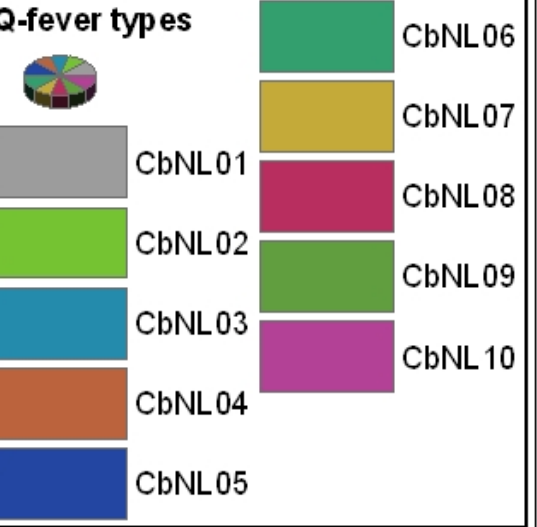
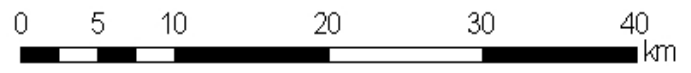
CbNL01

TILBURG

EINDHOVEN

HELMOND

**Legend**



# MLVA typing of *C. burnetii* from cattle

- 2 samples from cattle
  - 2007
  - High risk area Noord-Brabant
  - abortion



locus ID	geiten					koeien	
	CbNL 01	CbNL 02	CbNL 03	CbNL 04	CbNL 05	CbNL 14	CbNL 15
ms03	7	7	7	7	7	6	-1
ms12	7	7	-1	-1	-1	7	-1
ms21	6	6	6	6	6	6	-1
ms22	6	6	8	6	6	6	-1
ms30	6	4	6	9	0.5	6	-1
ms36	12	12	12	-1	12	3	3
ms27	3	3	-1	3	3	1	-1
ms28	3	3	3	3	-1	-1	-1
ms31	2	2	2	-1	-1	-1	-1
ms34	6	6	6	6	6	4/9	6
ms24	10	10	10+22	10	10	12	12
ms23	8					8	-1
	238	2	1	1	1	1	1



# Conclusions

- In dairy goats one MLVA type is predominantly present on dairy goat farms with abortions
- Indications of clonal spread
- Why is this MLVA type so successful?
  - Always present? -> why start the problems in 2005
  - Better survivor?
  - More virulent?
- Also found in humans
  
- In cattle different MLVA types present



# Why is Q-fever causing problems in the Netherlands since 2005?

## Hypothesis:

- Increase in goat husbandry:
  - Farms of 1000 to 7500 goats -> different dynamics of *C. burnetii*
- high concentration of goat farms in highly populated area
- Coincidence:
  - dry weather in spring in 2007, 2008 and 2009
- More virulent strain

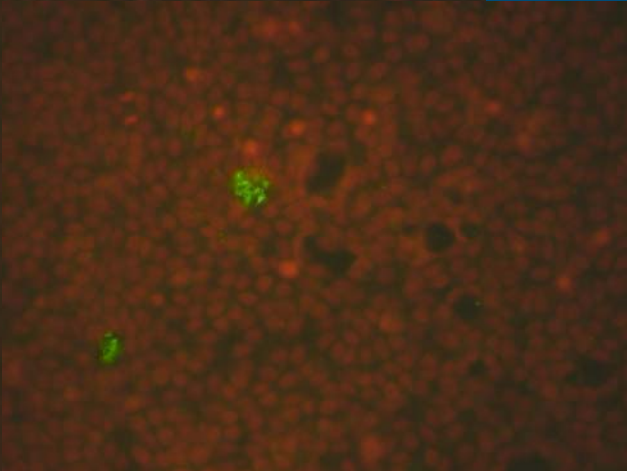
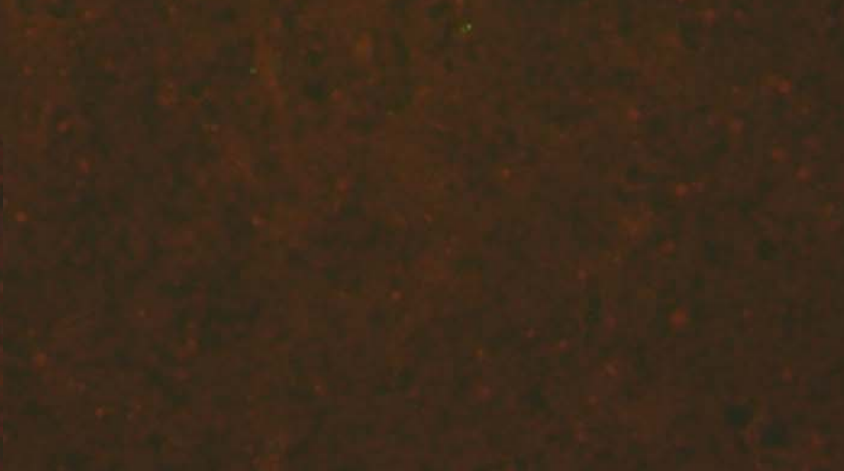
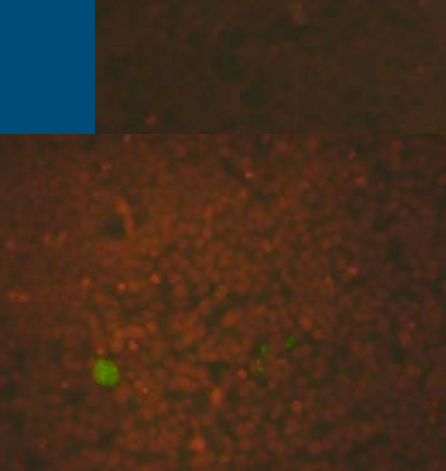
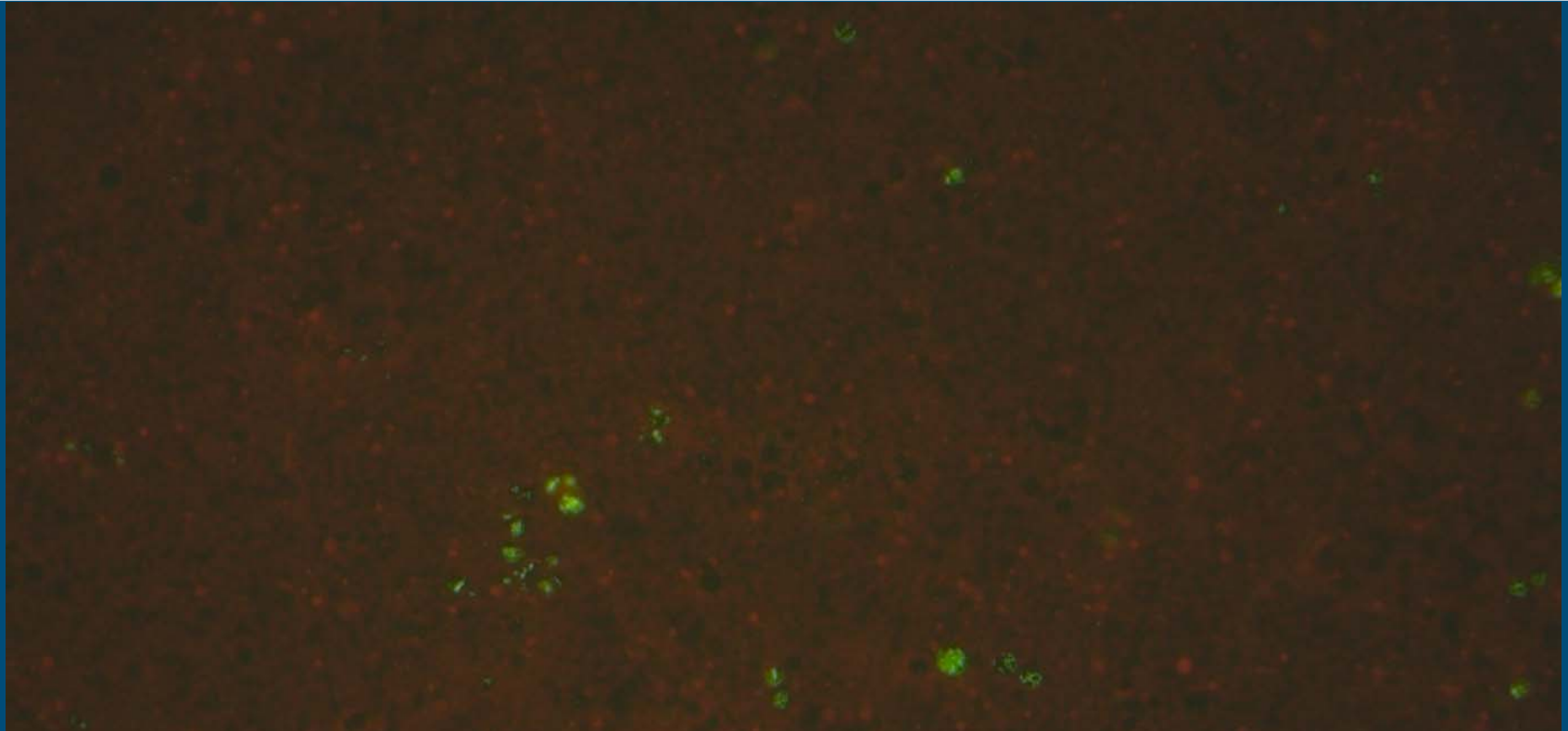


# Planned research assessing why?

- PhD student on herd dynamics, vet school, GD, CVI
- Cluster analysis human-goat relations, CVI-RIVM-GD
- Assessment of the virulence of the stain, CVI-INRA, France (Annie Rodolakis)
- Genome sequencing and comparison of different stains, CVI-RIVM



# First Dutch strain isolated in the Netherlands



# Questions/discussion

© Wageningen UR



CENTRAL VETERINARY INSTITUTE  
WAGENINGEN UR