



SIMV

SYNDICAT DE L'INDUSTRIE DU
MEDICAMENT ET REACTIF VETERINAIRES

SUCCESS STORY OF BLUETONGUE VACCINES

Rencontre Institut Pasteur – SIMV

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AGENDA

- ❖ **Bluetongue**
- ❖ **Collaborations**
- ❖ **Results**

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**Boehringer
Ingelheim**



BLUETONGUE

Viral and insect borne disease



Bluetongue virus

❖ Reoviridae Family

❖ Orbivirus Genus

❖ Double stranded RNA

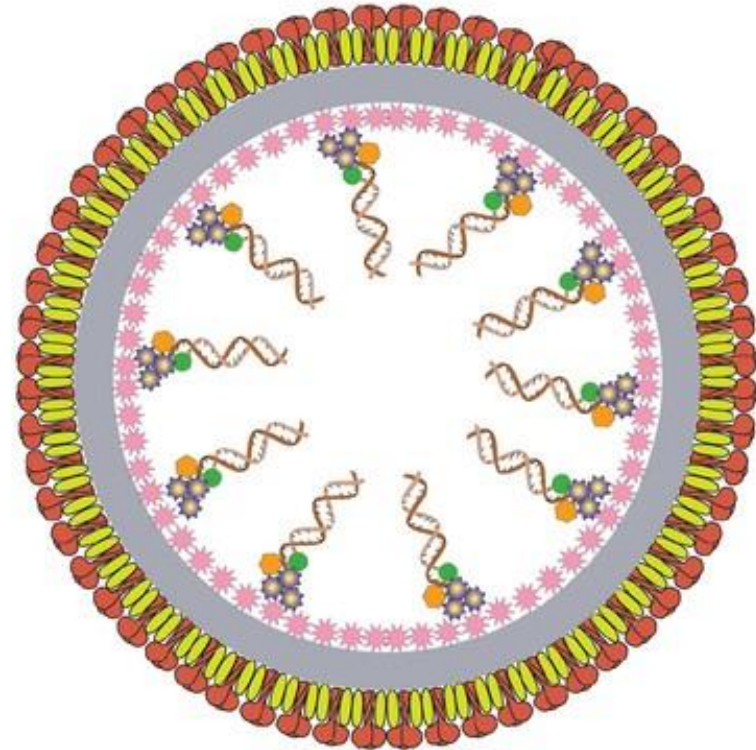
❖ Proteins

➤ 7 structural (VP1 to VP7)

➤ 3 non structural (NS1 à NS3)

❖ 27 serotypes defined by VP2 and VP5

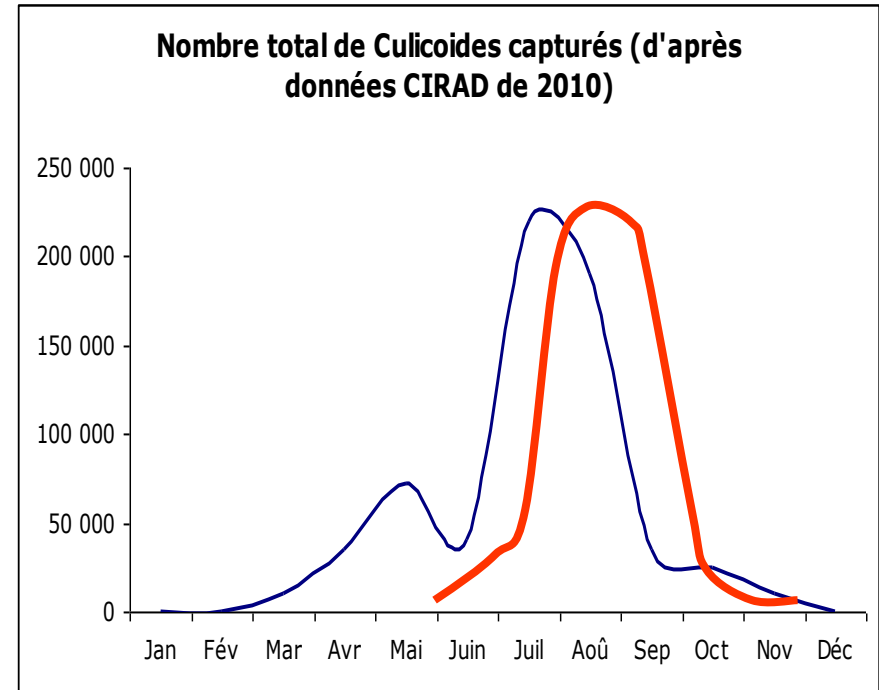
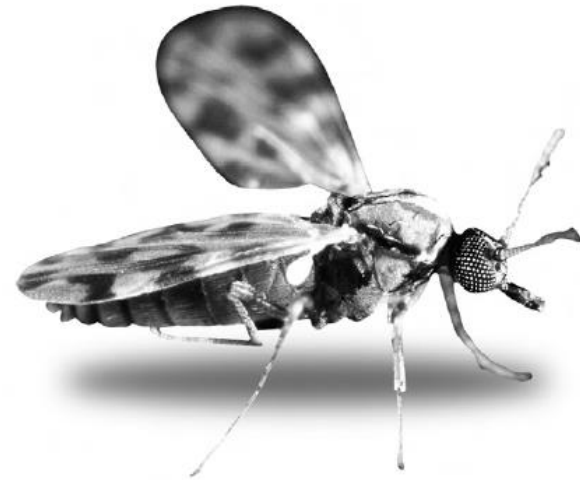
❖ No cross protection between serotypes





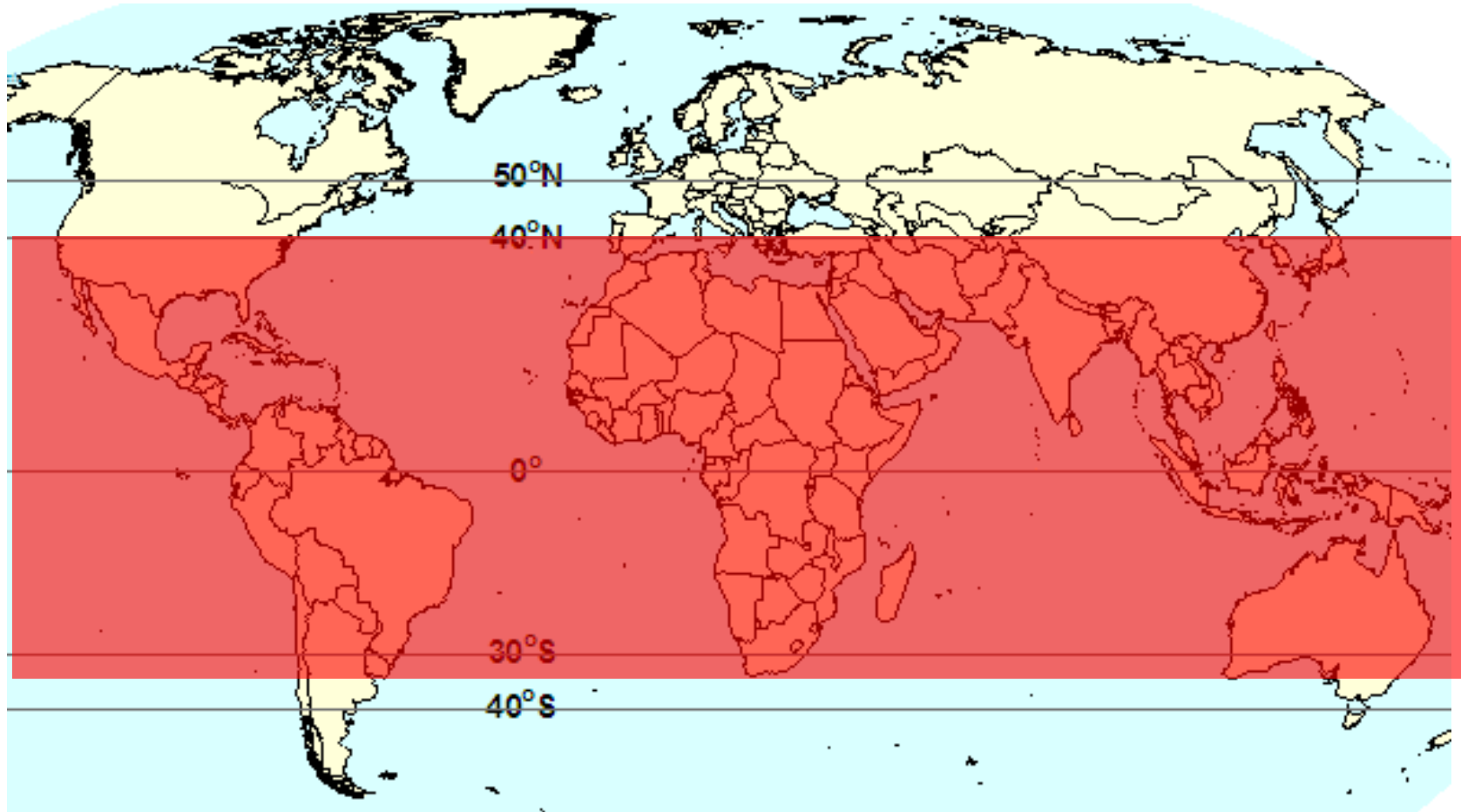
Insect borne viral disease

- ❖ Biting midge, *Culicoides*
- ❖ Blood meal on ruminants
- ❖ Seasonality
- ❖ Vaccine tool with viremia prevention



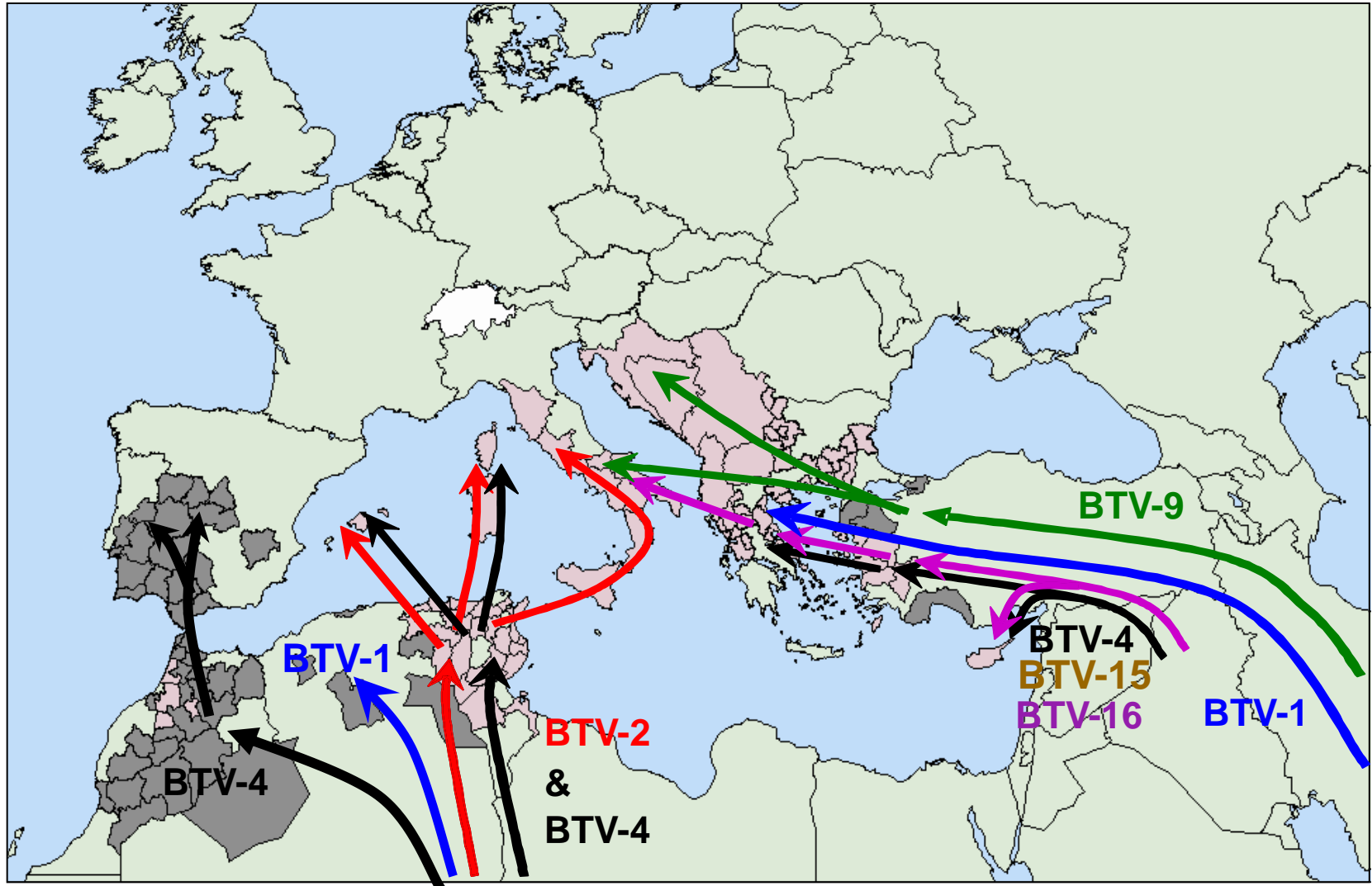


Epidemiology before 1998 : « exotic » disease



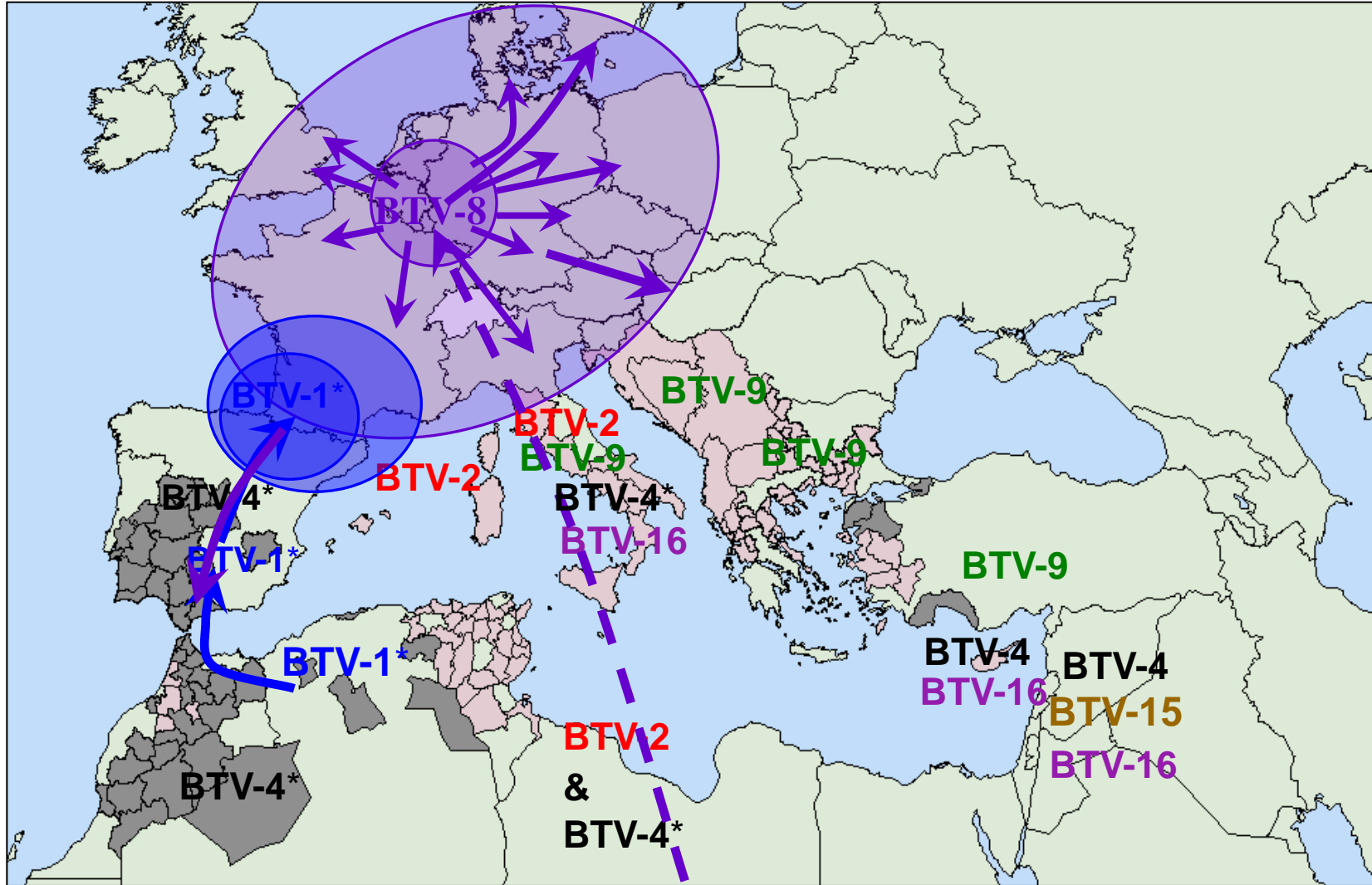


Introduction of several strains in Europe between 1998 and august 2006





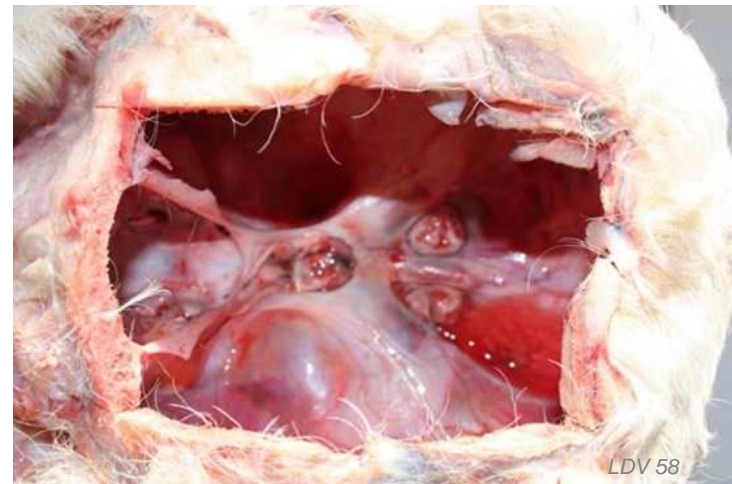
Introduction of several serotypes of BTV in Europe August 2006





Impact on ruminants

- ❖ Clinical signs
 - Hyperthermia
 - Oedema
- ❖ Reproduction performances
 - Abortions
 - Malformation
 - Loss of fertility
- ❖ Economical consequences
- ❖ Trade barriers : restriction zone, viro neg or vaccine





COLLABORATIONS

Merial and other scientific partners



Anses

- ❖ EA3 facilities before availability in Merial
 - Clinical trials in Anses Sophia Antipolis
 - First passage on sheep for viral amplification
 - Efficacy trial
 - Lab development in Anses Maisons Alfort
 - Adaptation of vaccine strain to cell culture
 - Build of the Master Seed
- ❖ Access to field strains
- ❖ Development and validation of analytical tools
- ❖ Virus isolation



European consortium

- ❖ DEVELOPMENT OF A SAFE, EFFICACIOUS BLUETONGUE VIRUS VACCINATION STRATEGY FOR EUROPE
- ❖ Merial identified as a unique industrial partner due to its experience in African Horse Sickness inactivated vaccine (similar virus)



European consortium partners

- ❖ Merial
- ❖ IAH Pirbright
- ❖ Onderstepoort South Africa
- ❖ Reference laboratory of Thessaloniki (Greece)
- ❖ London School of Hygiene & Tropical Medicine
- ❖ The School of Pharmacy, University of London
- ❖ IZS Teramo
- ❖ ANSES Maisons Alfort



European consortium achievements

- ❖ Most important (before public funding) :
 - Development of scientific network and sharing of knowledge
- ❖ Reagents and strains sharing
- ❖ Laboratory and clinical works
- ❖ Finally improvement of vaccine development



RESULTS

Development as fast as epidemiology



Very fast development

- ❖ First inactivated BTV vaccine in **2 years** in 2004
- ❖ **18 months** for the new European BTV8 serotype in 2008

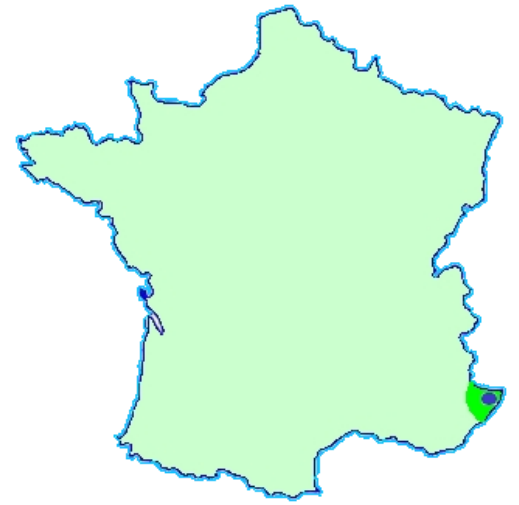
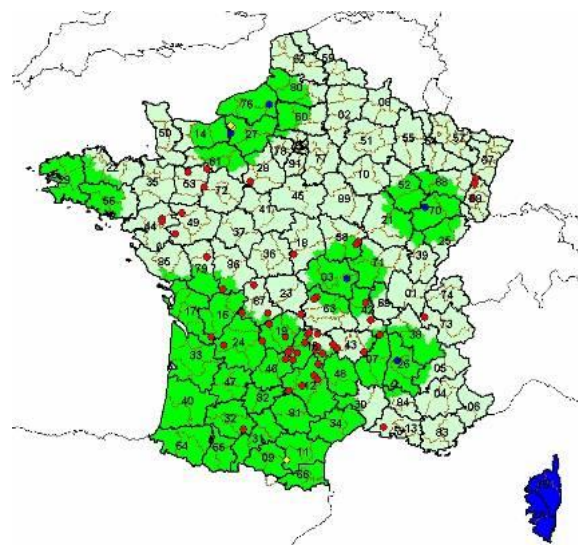
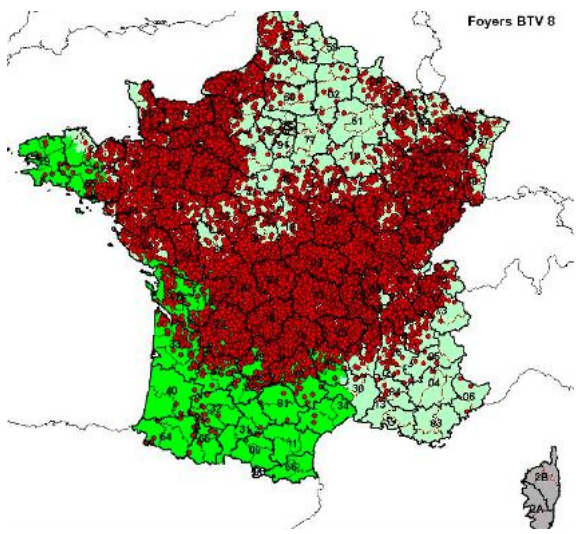


33 000 outbreaks in 2008
83 in 2009
1 in 2010, free status from 2014

2008

2009

2010



50%

90%

90%

Ruminant vaccination rate (source Avis Afssa)



Mass vaccination programs

- ❖ Millions doses used
- ❖ Efficacy and safety confirmed
- ❖ Recover fertility rate in cows and ewes
- ❖ Recover performance in trade (exportations)



Conclusion

- ❖ Bluetongue is a project unlike any other R&D project
- ❖ To respond the emergency situation in EU
- ❖ Accelerated development model
- ❖ Impossible without external collaborations
- ❖ Today, still collaboration for other BTV vaccine development
 - **Synthetic biology approach for a vaccine platform against known and newly emerging serotypes of BTV with Glasgow University**



Thank you for attention

