Atypical BSE in the natural host – an update 12 months post inoculation

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Rome

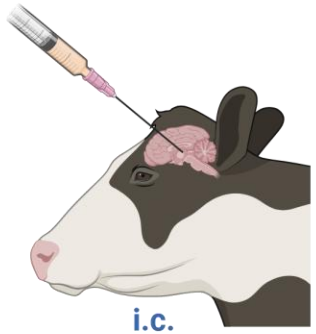
7th May 2026

Atypical BSE in the natural host – experimental setup

Study aim:
Propagation of reference material for active TSE surveillance according to EU RL 999/2001 for all European NRLs for TSE

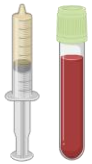
Study:
BSE infection study with H- and L-type BSE in 22 Frisian Holstein cattle

- 10 H-type BSE
- 10 L-type BSE
- 2 mock controls



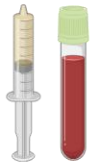
i.c. inoculation

blood



blood + cerebrospinal fluid

blood



blood + cerebrospinal fluid

expected onset of symptoms/ end of trial

preparations and negative test phase

August '24 - January '25 | April/ May '25 | September '25 | December '25/ January '26 | May '26 | August '26 | December '26

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Preparations & negative test phase – the stable

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- Establishing daily routines and testing the newly renovated BSE stable
- Parasitic treatment and BTV-vaccination
- Taking negative control samples
- Training of the i.c. inoculation

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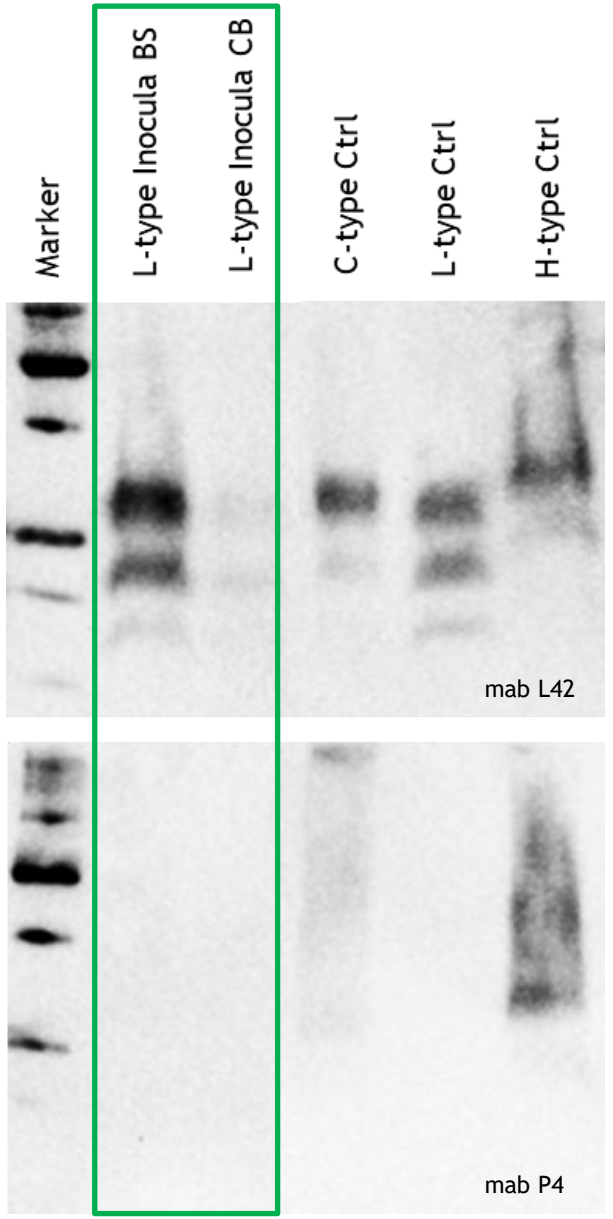
January - April 2025

Preparations & negative test phase – L-type

ID	L-Type
Origin	Bavaria/ Germany emergency slaughter
Breed	Pinzgauer
Age	14 years
Tissue	Brain stem and cerebellum

L-type inocula

- Brain stem with strong signal with mab L42
- Cerebellum only week signal with mab L42
- No signal with mab P4



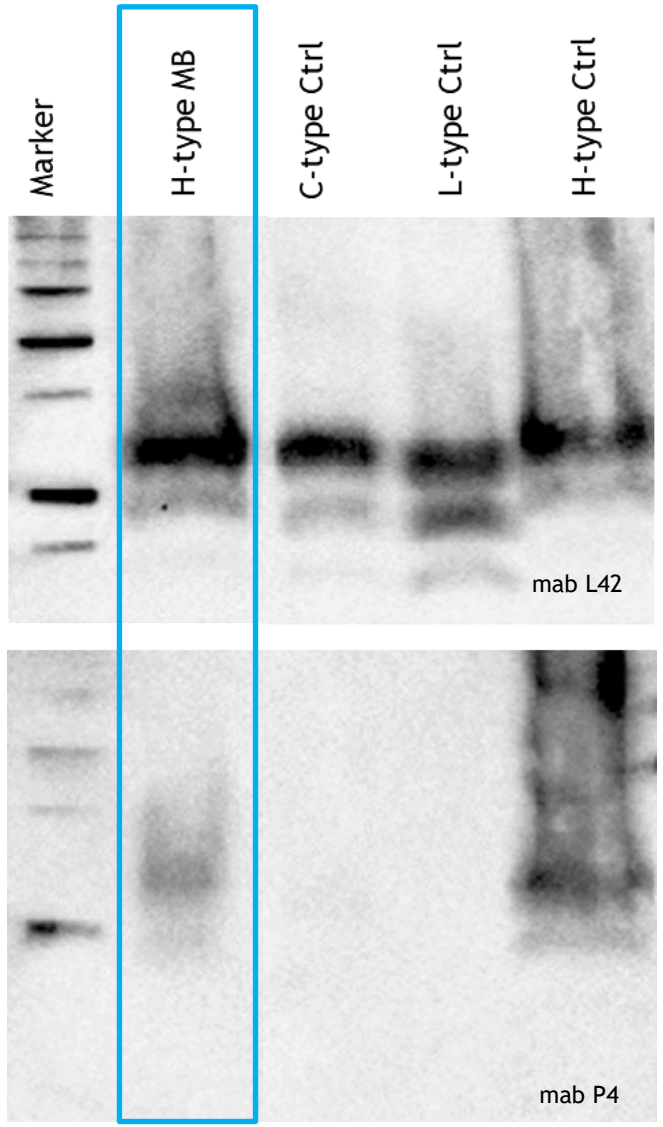
March - April 2025

Preparations & negative test phase – inocula

ID	H-Type
Origin	Bavaria/ Germany healthy slaughter
Breed	German Angus
Age	13 years
Tissue	Mid brain

H-type inocula

- Strong signal with mab L42
- Clear signal with mab P4



March - April 2025

Preparations & negative test phase – inocula

ID	L-Type	H-Type
Origin	Bavaria/ Germany emergency slaughter	Bavaria/ Germany healthy slaughter
Breed	Pinzgauer	German Angus
Age	14 years	13 years
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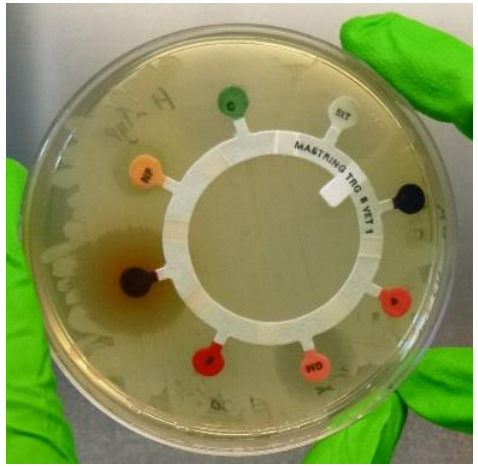

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- Several small aerobic and anaerobic colonies
- sensitive to erythromycin and streptomycin

Addition of 1-2% antibiotics to inocula

Atypical BSE in the natural host – the inoculation

Preparation for anaesthesia

Anaesthesia

Inoculation

Positioning of the animal

Preparation of the drill

Inoculation of 10% homogenates in NaCl + 1-2% antibiotics

April - May 2025

Emergencies

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Animals opened one gate →
Break into the feed storage

Result: 2 sick animals

Animal KT75 (Control)

- No feed intake
- 39,5°C body temperature
- Excessive drooling
- Pale skin
- Suspected ruminal acidosis
- Extremely stressed
- Died shortly after treatment

Necropsy:

- Severely dehydrated + anaemia
- Severe hematoma at the level of the cervical spine

Troubleshooting: Feeding grid

Cause of the severe neck trauma:

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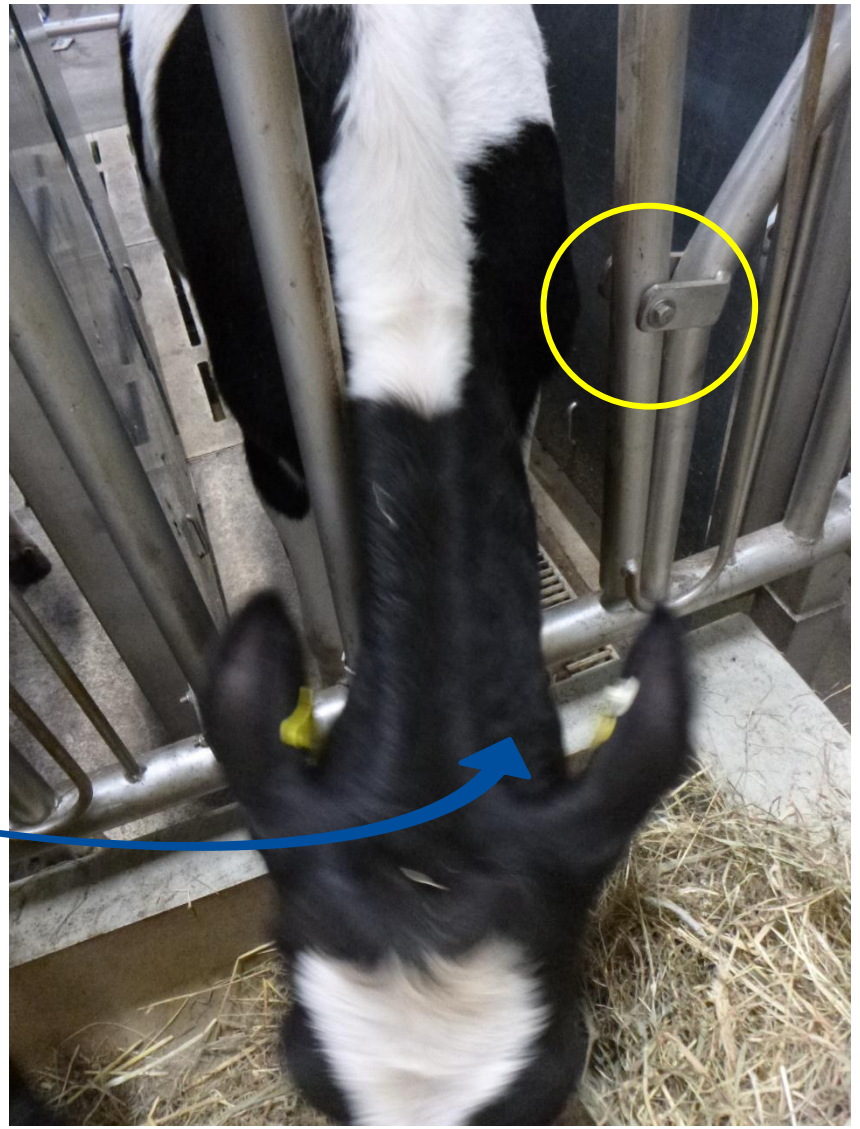
The screw cap caused severe trauma, when cattle continuously and forcefully moved backwards in the feeding grid



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Troubleshooting: Feeding grid

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2 more animals showed similar symptoms and bruises around their necks

→ **pain treatment and feeding in an open feeding grid to let the bruises heal**

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Solution for the feeding grid:
Removal of all screws and exchange with new ones to avoid further trauma

Emergencies

© FLI

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- Severe hematoma at the level of the cervical spine

Animal RA27

- Spread-eagled hindlimbs after fall/ slip
- inflamed skin sores at the stifles
- No food/ water intake
- No response to pain treatment for several days

Necropsy:

- Severely torn adductor muscles
- Haemorrhages in affected muscles
- Purulent inflammation of the skin at the level of the stifle joints

Troubleshooting: slippery floor

concrete floor gets slippery when wet (urine, faeces, water) → animals can get hurt

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Installation of special mats for cattle stables (Kraiburg profiKURA system)

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KRAIBURG
legt die Weide in den Stall

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3R: additional enrichment

To avoid stereotypic behaviour such as tongue rolling, sterotypic movement and to refine (3R) the experimental setup we equipped the stable with different enrichment

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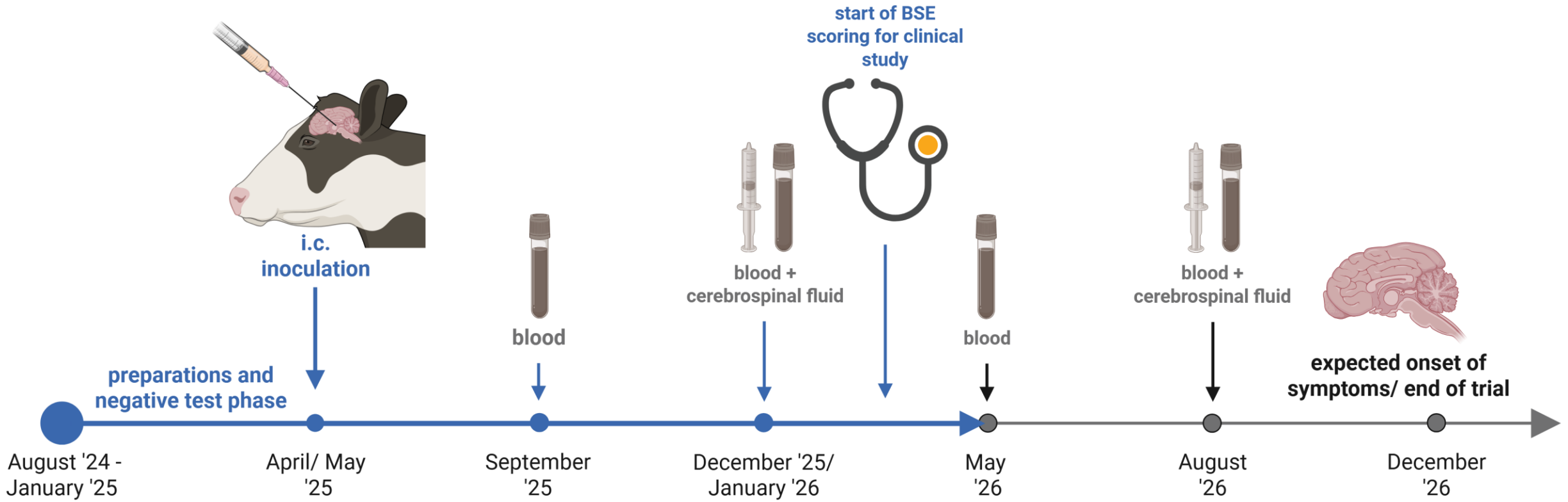
Clinical BSE study

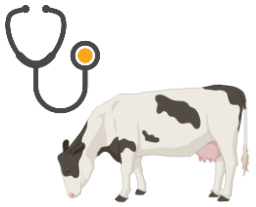
Study aim:

Regular clinical scoring of potential BSE symptoms to define clinical parameters from early onset of BSE until end stage disease that can be useful for veterinary practitioners, official veterinarians etc.



Februar 2026

Clinical BSE study



In cooperation with Ute Ziegler (FLI)

Clinical examination of BSE suspects (Braun et al., 2002) → every 8 weeks

- General examination: general condition, body condition score, body temperature, feed uptake
- Behavioral examination → observation in the stable/ feeding grid
- Neurological examination (senstivity) → reactions to noise, light, approaching, touch
- Gait analysis → lameness/ ataxia, orientation

General examination
Score 0 – 3/ parameter

+

BSE examination
Score 1 – 4/ parameter

Score > 30
→ BSE

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Clinical BSE study

„broomstick“ test

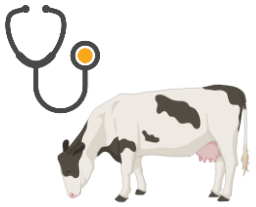
- Examination of back/ hind limb sensitivity with a broom stick
- Score 1 – 4 depending on reaction:
  - 1 no reaction
  - 2 Mild defensive movements
  - 3 Defensive movements/ kicking
  - 4 Severe kicking

Clinical BSE study

head sensitivity

- Approaching the animal
- Blink reflex/ threatening reflex
- Sensitivity to touch
- Score 1 – 4 depending on reaction:
  1 no reaction/ reflex
  2 Mild defensive movements
  3 Defensive movements/ head shaking/ overreaction
  4 Severe overreactions/ extreme (aggressive) head shaking

Clinical BSE study



Clinical examinations of all animals in February and April:

General examination
Score 0 – 3/ parameter

general condition, body condition score, body temperature, feed uptake

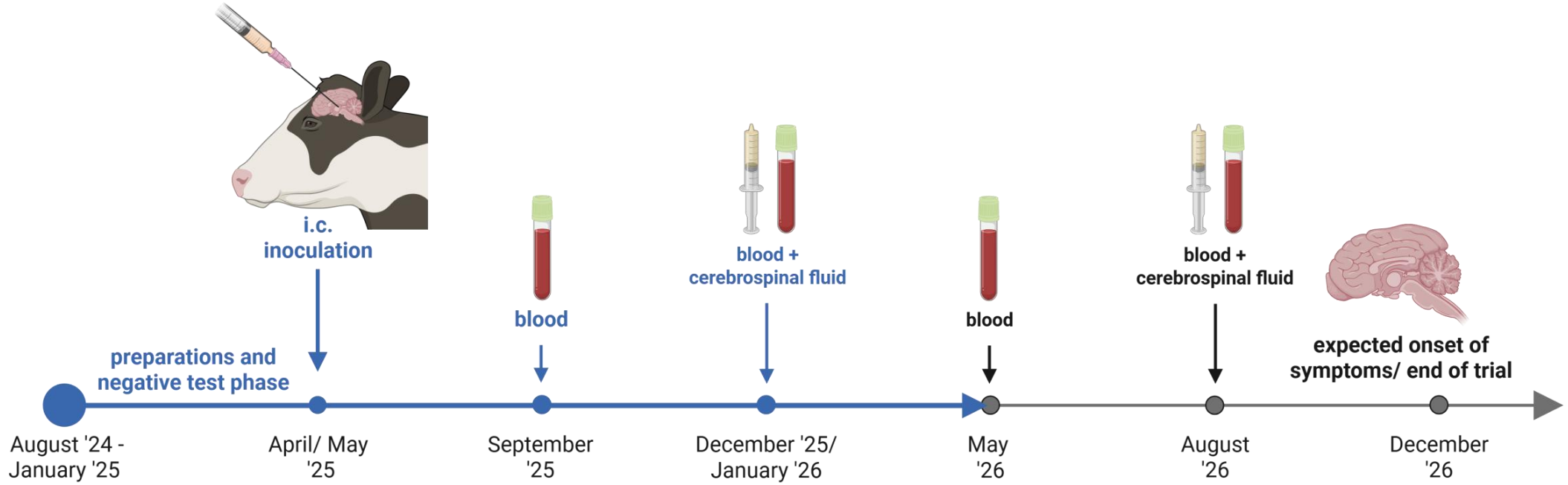
+

BSE examination
Score 1 – 4/ parameter

Behavior, Neurological examination, Gait analysis

→ no/ only mild reactions
→ no signs of a BSE-infection so far

Atypical BSE in the natural host - Outlook



1. Waiting for clinical signs
2. *PRNP* genotyping
3. Ongoing regular clinical examination and scoring (every 8 weeks)
4. Regular sampling of blood (every 4 months) & cerebrospinal fluid (every 8 months)

Thank you!

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