

## Effects of BVD? Congenital cataracts in BVD seropositive twin calves

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**“Congenital cataracts caused by BVDV” is regarded as a strong possibility.”**

### Background

The CNS symptoms improved during the next days. With 7 days, the calves still showed signs of blindness but were no longer apathetic. They could stand and walk normally in the cubicle, but still exhibit signs of unsteadiness outside the cubicle. An ophthalmologic exam on the 15th day of life (slit lamp and fundus camera) revealed cataractous lenses in both calves. The cataracts originated in the lens nucleus and radiated out to the perinuclear cortex.

Taking the non-progressive clinical course of the condition into account, numerous neurological causes could be ruled out. There was no evidence of a trauma related condition and also congenital disorders such as cerebellar hypoplasia or aplasia were unlikely. Lab tests didn't reveal deficiencies of selenium, copper or Vitamin A.



Figure 1: Calf no. 47258 with abnormal posture and splayed legs.

Both calves had been tested negative for BVDV antigen in the ear notches. They had antibodies against BVDV and BTV, but tested negative for SBV.

The mother also had antibodies against BVDV and BTV. She had been vaccinated against BTV some years ago, so the calves' antibodies against BTV were thought to be colostrum-related.

The mother had been tested negative for BVDV on several occasions as a calf. No vaccination against BVDV had been applied. As such, it was assumed that the mother had had a BVDV infection and recovered from it. It was not possible to prove without doubt when this infection had taken place.

### Preliminary Indication

Twin calves, male and female, were born in April 2014 without any problems or help during delivery. They were presented for veterinary assessment one day after birth. Upon inspection it was noted that especially the male calf did not stand up without help. The animal was unsteady and wobbly on its feet with markedly delayed proprioception.

The next day, extensive clinical and neurological assessments took place. There were also abnormal neurological findings in the female calf. Both calves had good appetite and unremarkable urine and faecal output. Heart rate of the male calf was 200 bpm, rectal temperature 39.4°C, respiration unremarkable.



Figure 2: The blind calves used their sense of smell for orientation

They had difficulties walking and deficits in postural and placing responses. Cranial nerve functions tests revealed absent menace response (which is difficult to interpret in young calves) and decreased to absent vision. Palpebral and sensory reflexes were normal. Spinal reflex testing showed increased pedal reflexes in the forelimbs and absent panniculus and tendon reflexes in the hind limbs.

### Further Development

The CNS symptoms improved during the next days. With 7 days, the calves still showed signs of blindness but were no longer apathetic. They could stand and walk normally in the cubicle, but still exhibit signs of unsteadiness outside the cubicle.



Figure 3: Cataractous lens in calf no. 47258

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## Result

In this case we found CNS symptoms in twin Holstein calves exhibiting congenital cataracts. The tests performed did not reveal the aetiology of the pathological findings but were strongly indicative of a prior BVD infection of the mother cow. After other causes were ruled out, “congenital cataracts caused by BVDV” is regarded as a strong possibility.

Parameter	Calf 47258	Calf 47257	Reference value*
Selenium	61	49	43-143 µg/l
Copper	77	80	102-203 µg/dl
Vitamin A	242	216	25-900 µg/l
BVD/MD antibody ELISA	Positive	Positive	-
BVD/MD antigen ELISA	Negative	Negative	-
BTV antibody ELISA	Positive	Positive	-
SBV PCR	Negative	Negative	-

\*As per Biocontrol (Mainz)

BVD/MD: bovine viral diarrhoea/mucosal disease, BTV: bluetongue virus, SBV: Schmallenberg virus, PCR: polymerase chain reaction.

Table 2: Blood test results for mother cow

Parameter	Mother cow
BVD/MD antibody ELISA	Positive
BVD/MD antibody AGP	Negative
BVD/MD antigen ELISA	Negative
BTV antibody ELISA	Positive
SBV antibody ELISA	Negative

BVD/MD: bovine viral diarrhoea/mucosal disease, AGP: agar gel precipitation, BTV: bluetongue virus, SBV: Schmallenberg virus.

## Questions

Q1: Which symptoms were seen in the newborn calves at the first day of life?

1. abnormal vocalization.
2. unsteadiness, markedly delayed proprioception.
3. no feed intake.

Q2: What was found during the ophthalmologic exam?

1. cataractous lenses in both calves.
2. microphthalmia.
3. glaucoma.