

Monitoring

ANIMAL HEALTH

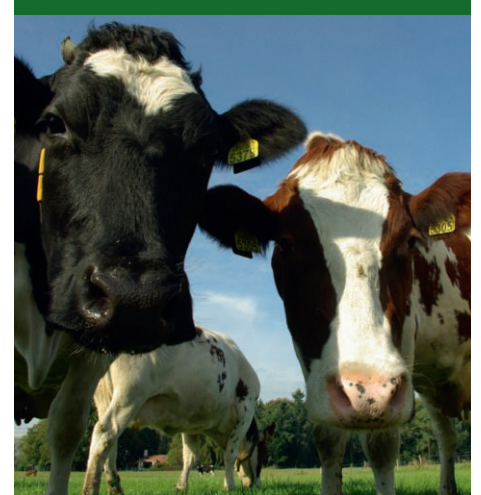


BTV-3 outbreak update: clinical symptoms, pathology and impact analysis

Since the start of the BTV serotype 3 outbreak in the Netherlands, the NWVA (Food and Consumer Products Safety Authority) has received 1,575 reports of clinical suspicions of infection with BTV-3 and 4,421 positive PCR test results (reference date 08-Jan-2024). The clinical appearance observed in individual animals is variable and the severity of the symptoms also varies from farm to farm. In addition to lesions in the mouth and on the tip of the nose and the udder, fever, conjunctivitis, red mucous membranes and lame animals with swollen coronary bands of the claws, regurgitation and loss of the claw capsule have also been reported. The symptoms reported also include drops in milk production and increased mortality. Pathological examinations of cattle suspected of having BTV-3 showed mostly erosions and ulcerations of the mucocutaneous transitions at the edge of the lips and the tip of the nose, ulcerations and petechiae in the oral cavity and pharynx, petechiae on the heart, the pulmonary artery and the aorta. Acute muscle degeneration was seen in various animals in the oesophagus, ruminal pillars and/or cardiac muscle. The muscular degeneration seen in the oesophagus in several animals may possibly explain the clinical observations of problems swallowing and regurgitation. The pathological findings also gave the first clear evidence of vertical transmission of BTV-3, with the virus being detected in the spleen of three premature or full-term aborted calves.

On instructions from LNV (the Ministry of Agriculture, Nature and Food Quality), GD launched a project for further investigation of the clinical appearance of BTV-3 and its impact on cattle and sheep farms, which included five cattle farms. The aim is to determine the prevalence within a herd and to find out if there are subclinically infected animals. Additionally, an initial descriptive analysis of the effect of the BTV-3 outbreak on milk production and cattle mortality was carried out at the end of the third quarter of 2023 for the Animal Health Monitor for Cattle. During the bluetongue outbreak in 2023, milk production per cow per day fell at all groups of farms for which livestock health had been affected to a greater or lesser degree by BTV-3 (see figure). The largest drop in milk production was seen on farms that reported clinical symptoms to the NVWA. From the time of reporting and for nine weeks thereafter, milk production at these farms fell by an average of almost one kilogram per cow with respect to the same period in previous years (2020-2022).

In terms of the location and time, cattle mortality seemed to correspond to the presence of a BTV-3 infection, with the greatest increases in mortality being among adult cattle (older than 2 years) at dairy farms. Mortality levels remained higher for a long time both at farms in an infected area that had not reported BTV-3 cases (up to 1.5x higher than in 2020-2022) and at farms that reported clinical symptoms (up to nearly 3.5x more deaths than in 2020-2022). Analyses will be carried out in the first half of 2024 looking at this in greater depth to give further interpretations of the findings.



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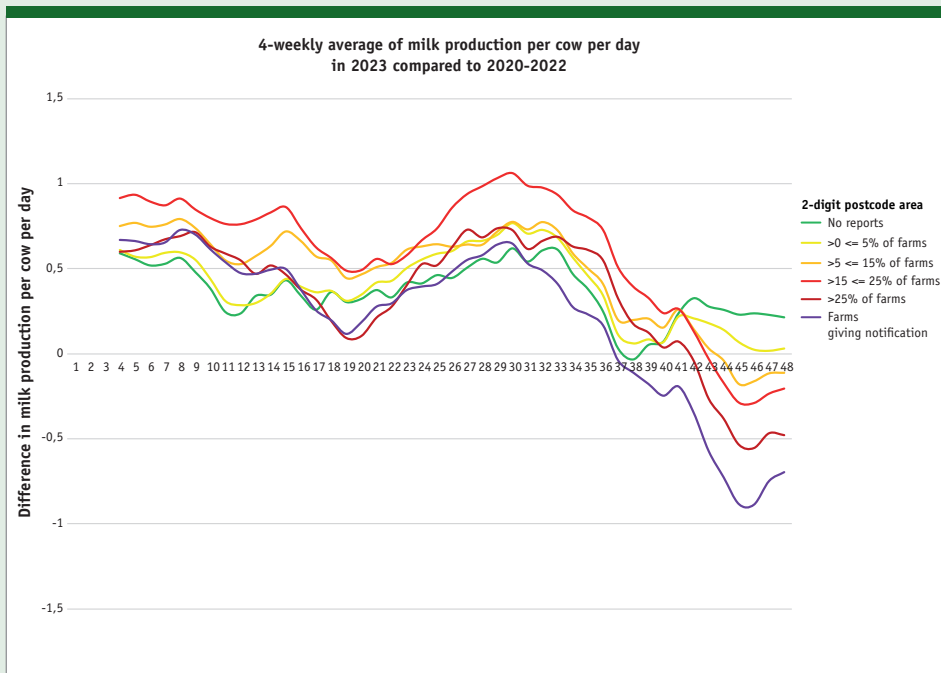


Figure: The difference in milk production per cow per day (in kg) in 2023 with respect to 2020-2022, represented as a rolling four-week average for six different groups of dairy farms: green: are free of notifications, yellow to dark red: the farm did not give notification itself but is in a region with a certain percentage of notified farms, purple: farm gave notification itself

Foreign countries are also facing outbreaks of bluetongue. Five outbreaks of BTV-3 have now been reported in Belgium, all involving infections of sheep in northern Flanders. Parts of Germany have lost their disease-free status after infections with BTV-3 were detected. The first infection in England was reported early in November, with various further infections also being detected later. Infections with a new strain of BTV-8 have been detected in France; these seem to be more severe than infections with the known strain. The assumption as yet is that the current vaccine is effective against the new BTV-8 strain. Additionally, serotype 4 (BTV-4) is circulating in Corsica and infections with BTV-4 have also been detected in Spain.

Deformed calves from the same breeding bull at two dairy farms

In the fourth quarter of 2023, the *Veekijker* was approached by a cattle farmer about multiple calves with congenital abnormalities at the farm. At that particular dairy farm, semen from a single Holstein bull was used for half the cows, whereas the other half were inseminated with semen from a Belgian Blue bull. Heifers were inseminated with a calving ease bull. All the abnormal calves that were born were from the Holstein bull, by which 47 calves had been born and dozens more were expected. The calves from the other bulls did not have any congenital defects. The most striking abnormalities were extra teeth near the base of the ear, double pelvises, large ears and schistosoma reflexum. Three calves were presented for necropsy: two calves had

large auricles and a partial structure on one side near the base of the ear for an extra mandible, with some teeth and a structure like a lower lip. The third calf had a not dissimilar structure for an extra mandible at the mandibular translation of the left lower jaw, along with ears that were set low down, drooping and of different sizes. This is probably the result of an embryonic development impairment, with partial extra structures for the head (partial craniofacial duplication) or with a defect in the embryonic development of the gill arch. Early in 2023, as part of the 'Abnormally born calves' pilot, a calf was submitted for pathological examination that once again had a partially formed lower jaw with several dental elements

on both sides, ventral to the auricle. A small tongue was also present on the right-hand side, plus a kind of oral cavity up to the base of the skull. The same Holstein breeding bull was the sire of that calf. Because these congenital malformations were so specific and comparable at the two farms and the calves had been sired by the same breeding bull, the *Veekijker* informed the breeding organisation, who stated that semen from this bull would no longer be used and that follow-up examinations would be carried out.

Update on the insensitivity of bacteria in material from animals from non-dairy farms

The increase in the percentage of *Mannheimia haemolytica* isolates that are insensitive to chlorotetracycline, doxycycline and oxytetracycline that was observed in the first and second quarters of 2023 did not increase in the third quarter but remained at a high level. The figure in the fourth quarter of 2022 was 58 per cent (n=45), compared to 77 per cent (n=75) in the first quarter of 2023, 93 per

cent (n=45) in the second quarter of 2023 and 86 per cent (n=28) in the third quarter of 2023. There has been a rising trend since 2016 in the percentage of *M. haemolytica* isolates that are insensitive to chlorotetracycline, doxycycline and oxytetracycline. The same upward trend was seen for *Pasteurella multocida*. That rising trend seems to have been halted since the

fourth quarter of 2021. As for *M. haemolytica*, the percentage of insensitive *P. multocida* isolates is being monitored closely. Tetracyclines are listed in the *Formularium Vleeskalveren en Vleesvee* of the KNMvD as the first-choice drug for treating bronchopneumonia and fibrinous pleuropneumonia caused by *M. haemolytica* and *P. multocida*.

Increase in the number of diagnoses of excessive keratinisation cornification of the rumen

In the fourth quarter of 2023, pathological examinations – particularly in the age category from 2 weeks to 6 months and in veal calves – showed a significant increase in the number of diagnoses of ‘excessive keratinisation of the rumen’. That diagnosis was made twenty times in the fourth quarter of 2023, as compared to five times in the same quarter the previous year. The diagnosis was also made more often in 2023 as a whole than in 2022 as a whole.

Abnormalities of the rumen wall consist principally of underdeveloped ruminal villi, thin rumen pillars, hyperkeratosis, plaque formation (areas where the ruminal villi clump together, along with hair, feed particles and cell wall material) and/or ruminitis. The rumen is then often overfilled with pale, frothy and partially fibrous matter. Risk factors for these changes are rumen drinking, a reflux of milk from an overfull abomasum, oral antibiotic treatments and/or an

unbalanced feed mixture that can ferment too rapidly. Raw fibre is needed for the rumen microbiome to develop and for encouraging the development of the ruminal villi. Limited development of the ruminal villi and abnormalities of the rumen wall can lead to the rumen not taking up volatile fatty acids sufficiently well, causing ruminal acidosis. In subacute and chronic cases, the rumen wall epithelium then exhibits excessive keratinisation.

Increase in the number of diagnoses of respiratory inflammations or pneumonia

The number of diagnoses of respiratory inflammations or pneumonia caused by infection with *Mycoplasma* spp. and/or *Pasteurella multocida* was significantly higher in the fourth quarter of 2023 than in the same quarter of the previous year. The total number of diagnoses in 2023 was also higher

than in 2022. Whereas eleven cases of respiratory inflammation or pneumonia caused by *Mycoplasma* spp. were detected in the fourth quarter last year, that number more than doubled in the fourth quarter of 2023 (to 29). The number of cases of respiratory inflammation or pneumonia

caused by *Pasteurella multocida* was also nearly two and a half times higher in the fourth quarter of 2023 than in the same quarter last year (34 and 14 cases respectively).

Increase in the number of diagnoses of lungworm

In the fourth quarter of 2023, pathological examination of animals presented for necropsy showed lungworm to be present significantly more often (eleven times) than in the preceding quarter and than in the

fourth quarter of the previous year (two times). Over the year as a whole, the number of lungworm diagnoses made during necropsy was much higher than last year. In contrast to the pathological examination

findings, the results of bulk milk testing for lungworm contamination remained comparable to the previous year.

Animal health of cattle in the Netherlands, fourth quarter of 2023

VETERINARY DISEASES	SITUATION IN THE NETHERLANDS	Category (AHR)	Highlights, fourth quarter of 2023
Implementing Regulation (EU) 2018/1882 of Animal Health Regulation (AHR) 2016/429 (category A disease)			
Lumpy Skin Disease (LSD)	Viral infection. The Netherlands is officially disease-free.	A, D, E	No infections ever detected.
Foot and Mouth Disease (FMD)	Viral infection. The Netherlands has been officially disease-free since 2001.	A, D, E	No infections detected.
Implementing Regulation (EU) 2018/1882 of Animal Health Regulation (AHR) 2016/429 (categories B to E)			
Bluetongue (BT)	Bluetongue serotype 3 outbreak in the Netherlands since September 2023.	C, D, E	Pathological findings, start of a project to get a picture of the clinical symptoms, initial impact analysis
Bovine genital campylobacteriosis	Bacterium. The Netherlands has been disease-free since 2009. Monitoring of AI and embryo stations and of animals for export.	D, E	<i>Campylobacter fetus</i> spp. <i>Veneralis</i> not detected.
Bovine Viral Diarrhoea (BVD)	Viral infection. Control measures compulsory for dairy farms but voluntary on beef cattle farms.	C, D, E	The status* of 90 per cent of dairy dairy herds have the BVD-free status or BVD-unsuspected status*. The status of 20 per cent of all non-dairy farms is favourable (BVD-free or BVD not suspected). <small>* The BVD status as determined according to the GD programme.</small>
Brucellosis (zoonosis, infection through animal contact or inadequately prepared food)	Bacterium. The Netherlands has been officially disease-free since 1999. Monitoring via antibody testing of blood samples from aborting cows.	B, D, E	No infections detected.
Enzootic bovine leukosis	Viral infection. The Netherlands has been officially disease-free since 1999. Monitoring via antibody testing of bulk milk and blood samples from slaughtered cattle.	C, D, E	No infections detected.
Epizootic Haemorrhagic Disease (EHD)	Viral infection. Detected since 2022 in cattle in Europe (Spain, Italy, Portugal and France).	D, E	No infections detected.
Infectious Bovine Rhinotracheitis (IBR)	Viral infection. Control measures compulsory for dairy farms but voluntary on beef cattle farms.	C, D, E	The status of 81 per cent of dairy farms is 'IBR-free' or 'IBR not suspected'. The status of 21 per cent of all non-dairy farms was favourable (IBR-free or IBR not suspected).
Anthrax (zoonosis, infection through contact with animals)	Bacterium. Not detected in the Netherlands since 1994. Monitoring through blood smears from fallen stock.	D, E	No infections detected.
Paratuberculosis	Bacterium. In the Netherlands, the control programme is compulsory for dairy farms. 99 per cent take part.	E	The PPN (<i>Paratuberculosis Programme Netherlands</i>) status of 83 per cent of dairy farms is 'A' ('not suspected').
Rabies (zoonosis, infection through bites or scratches)	Viral infection. The Netherlands has been officially disease-free since 2012 (an illegally imported dog).	B, D, E	No infections detected.
Bovine tuberculosis (TB) (zoonosis, infection through animal contact or inadequately prepared food)	Bacterium. The Netherlands has been officially disease-free since 1999. Monitoring of slaughtered cattle.	B, D, E	No infections detected.
Trichomonas	Bacterium. The Netherlands has been disease-free since 2009. Monitoring of AI and embryo stations and of animals destined for export.	C, D, E	<i>Tritrichomonas foetus</i> not detected.

Table continuation

VETERINARY DISEASES	SITUATION IN THE NETHERLANDS	Category (AHR)	Highlights, fourth quarter of 2023
Q fever (zoonosis, infection through dust or inadequately prepared food)	Bacterium. In the Netherlands, this is a different strain to the one found on goat farms with no established relationship to human illness. From the first quarter of 2023 onwards, this is once again part of the aborter pathology protocol.	E	No infections detected in aborted foetuses.
Article 3a.1 Notification of zoonoses and disease symptoms, 'Rules for Animal Husbandry' from the Dutch Animals Act			
Leptospirosis (zoonosis, infection through animal contact or inadequately prepared food)	Bacterium. Control measures compulsory for dairy farms but voluntary on beef cattle farms.	-	The status of 98.1 per cent of dairy farms is 'leptospirosis-free'. The status of 30.4 per cent of non-dairy farms is 'leptospirosis-free'. Animals are still arriving with a leptospirosis status poorer than 'free' and in greater numbers than in the previous quarter. Two dairy farms with leptospirosis infections.
Listeriosis (zoonosis, infection through inadequately prepared food)	Bacterium. Infections have occasionally been detected in cattle.	-	Infections were detected in one cow presented for necropsy and two aborted foetuses.
Salmonellosis (zoonosis, infection through animal contact or inadequately prepared food)	Bacterium. Control measures compulsory for dairy farms but voluntary on beef cattle farms.	-	The bulk milk results of 95.1 per cent of dairy farms are favourable (nationwide programme).
Yersiniosis (zoonosis, infection through animal contact or inadequately prepared food)	Bacterium. Infections detected occasionally in cattle, mostly in aborted foetuses.	-	No infections detected.
Regulation (EC) no. 999/2001			
Bovine Spongiform Encephalopathy (BSE)	Prion infection. The OIE status for the Netherlands is 'negligible risk'. Monitoring has not revealed any further cases since 2010 (total from 1997 to 2009: 88 cases).	-	No infections detected.
Other infectious diseases in cattle			
Malignant Catarrhal Fever (MCF)	Viral infection. There are occasional cases in the Netherlands of infection with type 2 ovine herpes virus.	-	Two infections confirmed upon necropsy.
Liver fluke	Parasite. Liver flukes are endemic in the Netherlands, particularly in wetland areas.	-	Infections were detected at 29 farms and in two cows presented for necropsy.
Neosporosis	Parasite. In the Netherlands, this is an important infectious cause of abortion in cows.	-	Infections were detected in four aborted foetuses presented for necropsy.
Tick-borne diseases	External parasite that can transmit infections. Ticks infected with <i>Babesia divergens</i> , <i>Anaplasma phagocytophilum</i> and <i>Mycoplasma wenyonii</i> can be found in the Netherlands.	-	No infections with <i>Anaplasma phagocytophilum</i> detected.



Animal health monitoring

Since 2002, Royal GD has been responsible for animal health monitoring in the Netherlands, in close collaboration with the veterinary sectors, the business community, the Ministry of Agriculture, Nature and Food Quality, vets and farmers. The information used for the surveillance programme is gathered in various ways, whereby the initiative comes in part from vets and farmers, and partly from Royal GD. This information is fully interpreted to achieve the objectives of the surveillance programme – the rapid identification of health problems on the one hand and the following of more general trends and developments on the other. Together, we team up for animal health, in the interests of animals, their owners and society at large.