

Impact of changing demography of Dutch dairy farms on bovine mortality percentage

In the first quarter of 2020, the mortality rate for cattle older than 1 year at Dutch dairy farms increased to 0.85 percent. This was higher than the first quarter of 2019 (0.72 percent) and that of previous years (Figure 1).

The reason for the slight increase lies in the rising share of older animals at farms. After all, we know that the risk of mortality increases relative to the increasing age. That is indeed apparent following further analysis. Within the group of cattle aged 1 year and older, bovine mortality was highest among cattle older than 68 months (four or more lactation periods, on average 1.7 percent per quarter) and lowest in young cattle aged between 1 and 2 years (on average 0.4 percent per quarter) (Figure 2A). The age composition of cattle older than 1 year has changed considerably at dairy farms over the

past five years. The share of cattle older than 68 months increased from 19 percent to 23 percent (from 23 to 29 cows on average), while the share of young cattle aged 1 to 2 years decreased from 27 percent to 21 percent (from 36 to 28 cows on average) (Figure 2B).

The share of older cattle at dairy farms increased and we are not seeing any clear increase in mortality within the specific age groups. The increased bovine mortality above the age of 1 year seem to be caused by the increased share of older cattle at dairy farms.

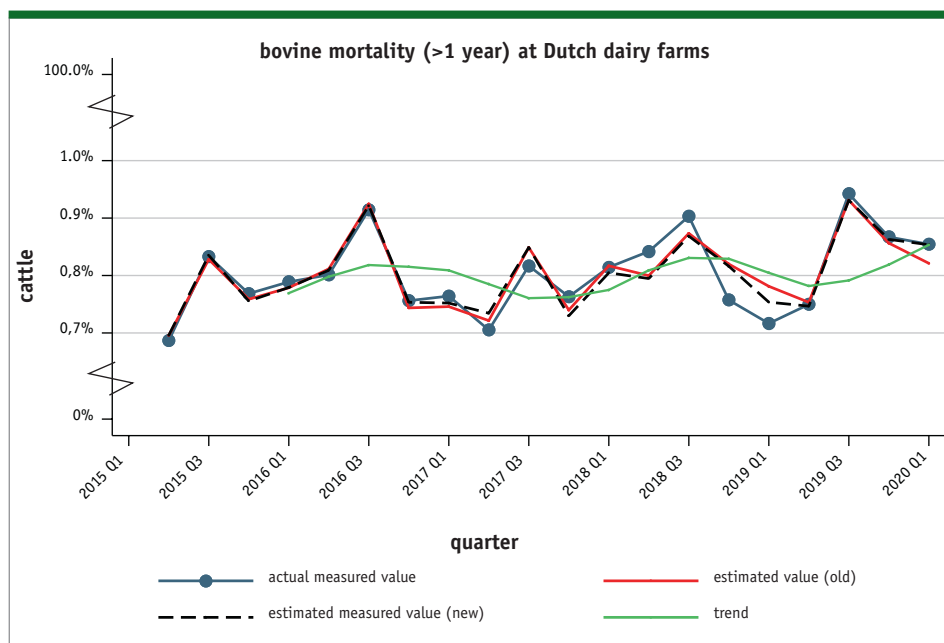
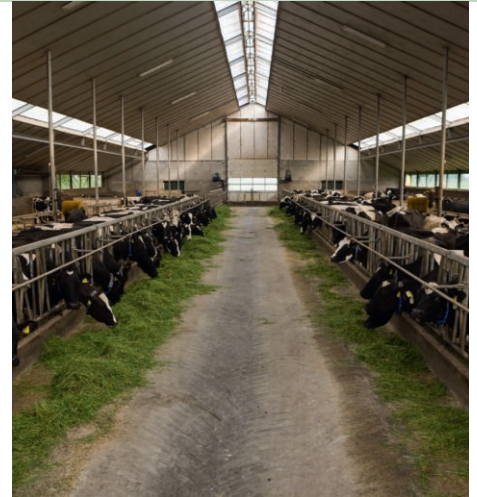


Figure 1. Mortality rate* of cattle older than 1 year, per quarter, at Dutch dairy farms in the period from 1 April 2015 through March 2020 (Source: Data analysis)

* The mortality rate is calculated as the ratio of dead animals versus the number of animals present at the farm, given in the figure as a percentage.

Seven dairy farms with a leptospirosis infection

A leptospirosis infection was found at seven dairy farms (antibodies were found in the bulk milk twice). This is an increase versus previous years. In addition, there was a suspected infection at one more dairy farm, but a second bulk milk test could not take place because the cattle had already been disposed of. However, one of the seven infected farms where antibodies have now been found, had purchased cattle from the suspected farm. Two farms treated all animals with antibiotics, and therefore had suspect/treated status. Three of the seven farms had imported animals from Germany. Two other farms, at which antibodies have now been detected, had purchased cattle from Dutch dairy farms, including foreign cattle.

Our advice is to always pre-screen animals from abroad, to transport them to the Netherlands individually and to initially place them in quarantine for four to six weeks. After all, infection can also occur during transport. If the animals have been examined directly upon arrival, have them examined again at the end of the quarantine period. When pre-screening has taken place abroad, ensure a sensitive test has been used. The MAT test is still used abroad very often, and is less sensitive than the ELISA we use here in the Netherlands. The MAT test can give a negative result six months after infection, even though the animals are still infectious. This advice also applies to animal movements within the Netherlands, if the source farm is not leptospirosis-free.

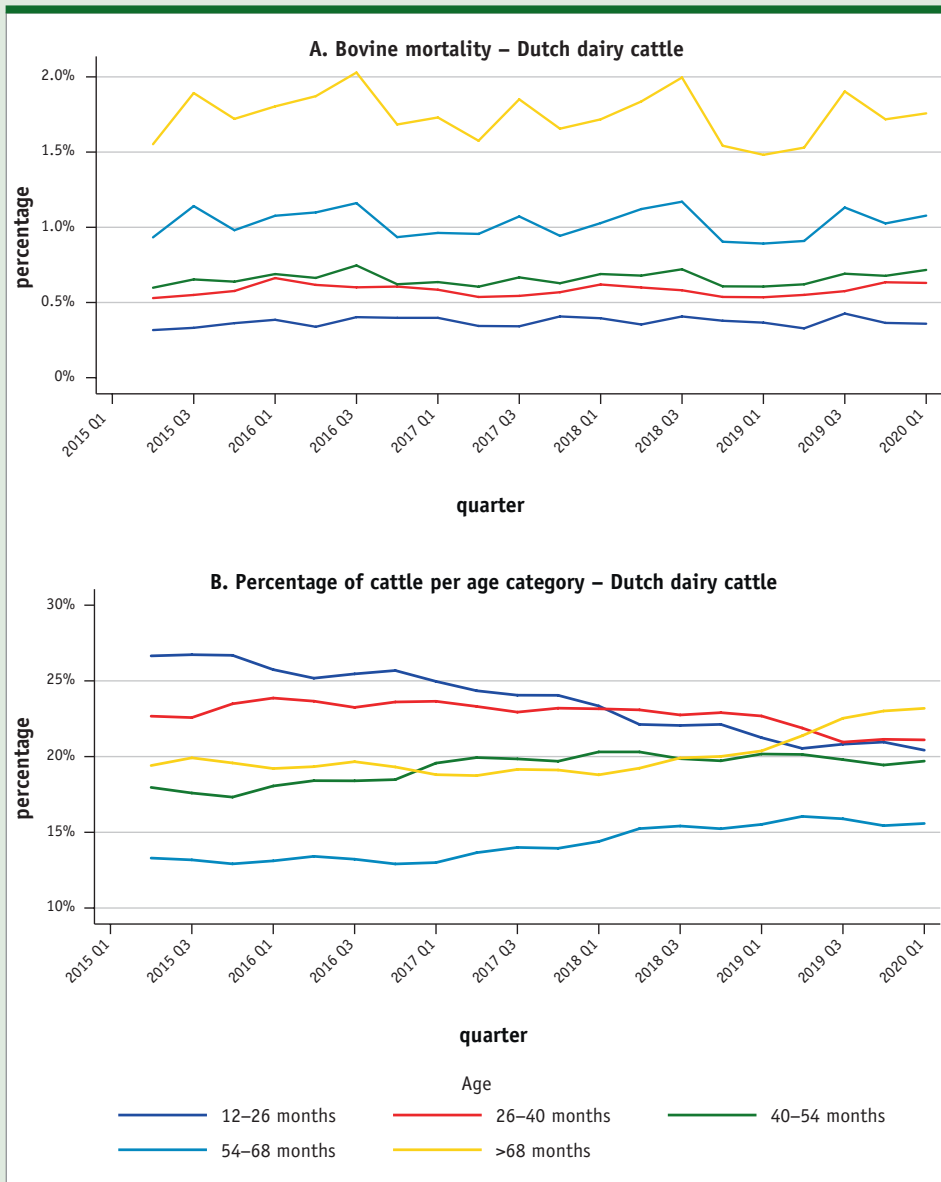


Figure 2. A. Mortality rate* of cattle older than 1 year, per age category and B. Number of cattle present per age category, per quarter, at dairy farms in the period from 1 April 2015 through 31 March 2020 (Source: Data analysis)

* The mortality rate is calculated as the ratio of dead animals versus the number of animals present at the farm, given in the figure as a percentage.

Human TBE outbreak in France

Tick-borne encephalitis (TBE) is a viral infection and a zoonosis. Ruminants become infected when bitten by an infected tick. Cattle do not generally display clinical symptoms, but can transmit the virus in milk during the viremia, which lasts one week. Raw milk can therefore be a source of infection for people.

In early June, a notification was received via Promed of a human TBE outbreak in France, after eating raw-milk cheeses made from goat's and cow's milk. By mid-June, 28 people were infected. All the cheese came from the same farm, and was taken off the market. At the end of June, Promed announced that a total of more than forty people had been infected and that it turned out that the cheeses were made exclusively from raw goat's milk.

In 2017, a study was undertaken in the Netherlands into TBE prevalence in deer. Deer with TBE antibodies were discovered in both the Utrechtse Heuvelrug and Sallandse Heuvelrug regions. This observation was communicated to doctors and vets by the Dutch Wildlife Health Centre.

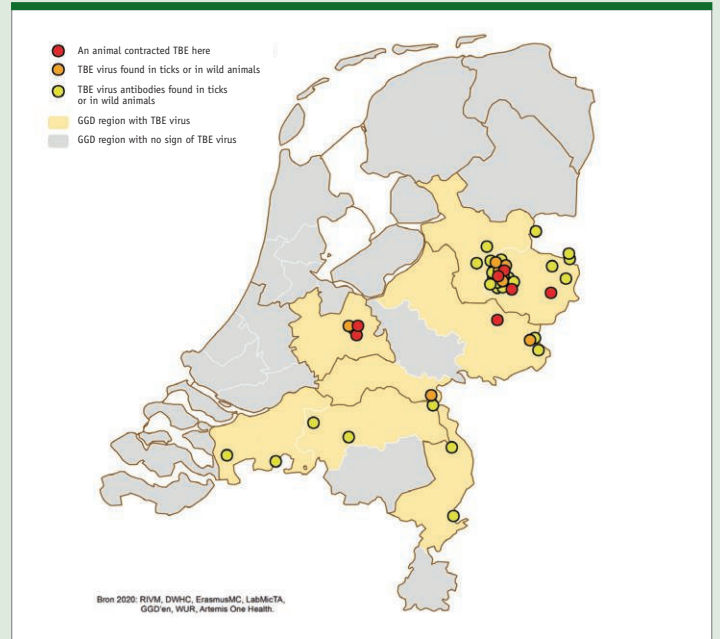


Figure 3. Prevalence of TBE/FSME virus in the Netherlands (source: RIVM, DWHC, Erasmus MC, LabMicTA, GGD's en, WUR, Artemis One Health).

Trends and developments in bovine diseases: a closer look at the pathology data

One of the aspects of animal health monitoring of cattle is the registration and reporting of the findings of pathological examinations. Until now, this monitoring was only conducted for the main diagnoses. This results in the risk that trends, in specific diseases often identified as a secondary diagnosis or in pathologies that do not commonly occur, will go unnoticed or will only be detected at a later stage.

GD has therefore applied an existing method in the analysis of pathological data in order to provide insight into the findings per type of farm and age group. A distinction is made between dairy farms (aborted foetuses, breeding calves <1 year, dairy cows >1 year) and veal farms.

All findings in organ systems during pathological examination (such as lung infections, digestive tract infections and new pathologies) have been subdivided into relevant diseases per type of farm. The trend is visualised per disease and over time, per quarter (Figures 4 and 5).

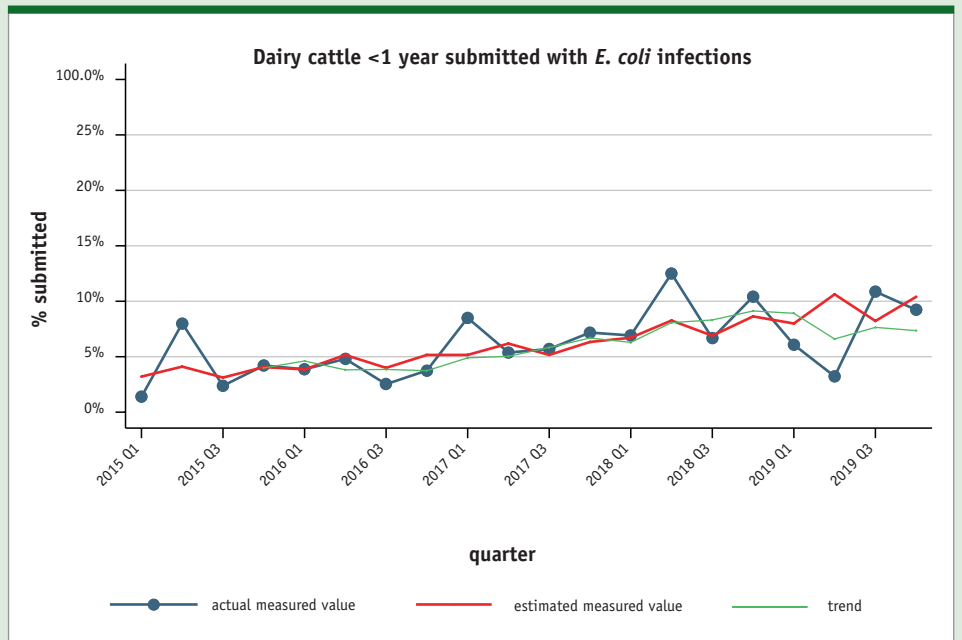


Figure 4. Percentage of submitted dairy cows <1 year with diseases caused by E. coli infections in the period from 1 January 2015 through 31 December 2019.

In the period from 2015 through 2019 for example, infections with *Escherichia coli* (with the exception of *E. coli* F5 (K99)) attracted attention. Infections with *E. coli* occurred on average in 6 percent of breeding calves (dairy cattle <1 year). The *E. coli* infections were associated with sepsis in 44.9 percent of these cases. The percentage of breeding calves submitted and diagnosed with an *E. coli* infection increased significantly (Figure 4).

An infection with *E. coli* was found in 9.5 percent of the cases in dairy cows older than 1 year. This percentage was stable over the whole period analysed. Such infections were often associated with the presence of mastitis (39.6 percent) or sepsis (31.1 percent).

Pathological examination showed an infection with *E. coli* in 7.2 percent of the veal calves on average. In those cases, this infection mainly caused sepsis (35.5 percent) or polyserositis (18.9 percent). The percentage of veal calves with *E. coli* infections also increased significantly over time (Figure 5).

These new analyses enable us to monitor trends and developments in pathological findings more efficiently, and to detect significant deviations more quickly based on both main and secondary diagnoses. These signals keep us alert to new developments.

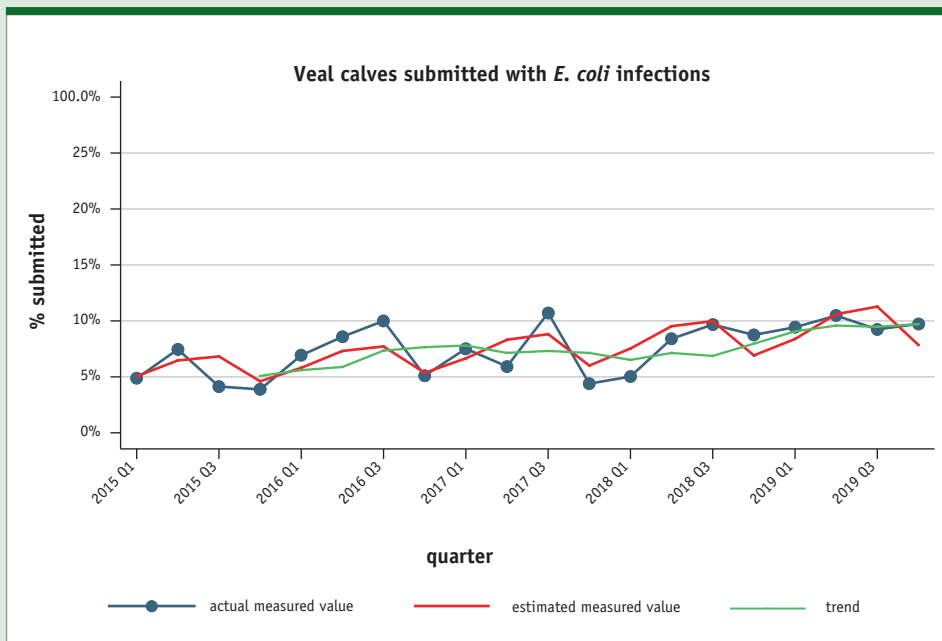


Figure 5. Percentage of submitted veal calves with diseases caused by *E. coli* infections in the period from 1 January 2015 through 31 December 2019.

Animal health barometer for cattle, second quarter 2020

VETERINARY DISEASES	SITUATION IN THE NETHERLANDS	Surveillance – Highlights Second Quarter 2020
Article 15 GWWD (Health & Welfare Act) compulsory reportable and treatable diseases (diseases named in article 2 of the 'Rules for prevention, control and monitoring of infectious animal diseases and zoonoses and TSEs')		
Bluetongue (BT)	Viral infection. The Netherlands has been officially disease-free since 2012 (all serotypes). Annual screening.	The Netherlands BT-free, no infections detected.
Brucellosis (zoonosis, infection via animal contact or inadequately prepared food)	Bacterial infection. The Netherlands has been officially disease-free since 1999. Monitoring via antibody testing of blood samples from aborting cows.	Eight re-tests, no infections detected.
Bovine Spongiform Encephalopathy (BSE)	Prion infection. The Netherlands has OIE status 'negligible risk'. No cases detected upon monitoring since 2010 (total 88 cases between 1997-2009).	No infections detected.
Enzootic Bovine Leucosis (EBL)	Viral infection. The Netherlands has been officially disease-free since 1999. Monitoring via antibody testing of bulk milk and blood samples of slaughtered cattle.	No infections detected.
Lumpy skin disease (LSD)	Viral infection. The Netherlands is officially disease-free.	Infections have never been detected.
Anthrax (zoonosis, infection via animal contact)	Bacterial infection. Not detected in the Netherlands since 1994. Monitoring via blood smears from fallen stock.	No infections detected.
Foot and Mouth Disease (FMD)	Viral infection. The Netherlands has been officially disease-free since 2001.	No infections detected.
Rabies (zoonosis, infection via bite or scratch)	Viral infection. The Netherlands has been officially disease-free since 2012 (illegally imported dog).	No infections detected.
Bovine Tuberculosis (TBC) (zoonosis, infection via animal contact or inadequately prepared food)	Bacterial infection. The Netherlands has been officially disease-free since 1999. Monitoring via slaughtered cattle.	No infections detected.
Article 100 GWWD (Health & Welfare Act) compulsory reportable diseases (diseases named in article 10 of the 'Rules for prevention, control and monitoring of infectious animal diseases and zoonoses and TSEs')		
<i>Campylobacter fetus ssp. venerealis</i> and <i>Trichomonas foetus</i>	Bacterial infection. The Netherlands has been disease-free since 2009. Monitoring of AI and embryo stations, and in animals for export.	No infections detected.
Leptospirosis (zoonosis, infection via animal contact or inadequately prepared food)	Bacterial infection. Control programme compulsory for dairy farms, voluntary for non-dairy farms.	Eight farms with antibodies in bulk milk; infection was confirmed at seven of them.
Listeriosis (zoonosis, infection via inadequately prepared food)	Bacterial infection. Occasional infection detected in cattle.	Infections detected in two aborted foetuses, in two cattle submitted for necropsy and in a bulk milk sample.
Salmonellosis (zoonosis, infection via animal contact or inadequately prepared food)	Bacterial infection. Control programme compulsory for dairy farms, voluntary for non-dairy farms.	97 percent of the dairy farms has favourable bulk milk results (national programme).
Yersiniosis (zoonosis, infection via animal contact or inadequately prepared food)	Bacterial infection. Detected occasionally in cattle, mostly in aborted foetuses.	No infections detected in cattle submitted for necropsy. No <i>Yersina species</i> cultivated in milk samples.

Table continuation

VETERINARY DISEASES	SITUATION IN THE NETHERLANDS	Surveillance – Highlights Second Quarter 2020
Other OIE-list diseases in the Netherlands subject to compulsory reporting		
Bovine Viral Diarrhoea (BVD)	Viral infection. Control programme compulsory for dairy farms, voluntary for non-dairy farms.	Among dairy farms, 81 percent had BVD-virus free status or BVD-bulk milk antibody unsuspected status. This is 16 percent among voluntarily participating non-dairy farms.
Infectious Bovine Rhinotracheitis (IBR)	Viral infection. Control programme compulsory for dairy farms, voluntary for non-dairy farms.	Among dairy farms, 76 percent had IBR-virus free or IBR-unsuspected status. This is 16 percent among voluntarily participating non-dairy farms.
Paratuberculosis	Bacterial infection. Control programme compulsory for Dutch dairy farms; 99 percent has PPN status.	Of these dairy farms, 78 percent has PPN status A (unsuspected).
Tick borne diseases	Vector borne diseases. Ticks infected with <i>Babesia divergens</i> , <i>Anaplasma phagocytophilia</i> and <i>Mycoplasma wenyonii</i> are present in the Netherlands.	No infections detected.
Other infectious diseases in cattle		
Malignant Catarrhal Fever (MCF)	Viral infection. Infections with Ovine herpes virus type 2 occur occasionally in the Netherlands.	One infection detected at necropsy.
Liver fluke	Parasite. Liver fluke is present in the Netherlands, particularly in wetland areas.	Infections detected at three farms.
Neosporosis	Parasite. An infectious cause of abortion in the Netherlands.	Infection detected in three submitted aborted fetuses.
Q-fever (zoonosis, infection via dust or inadequately prepared food)	Bacterial infection. In the Netherlands, a different strain in cattle to that found on goat farms, with no established relationship to human illness.	No infections detected.
From monitoring		
Intoxication	Cyanobacteria (blue-green algae) intoxication in dairy cattle early in the season this year, caused among other things by water in drinking troughs.	
Data analysis	The changing demography in the cattle sector is influencing the animal health characteristics. The import of cattle at dairy farms and young stock rearing farms has increased again.	
Resistance to antibiotics at dairy farms	<i>E. coli</i> -resistance to florfenicol is increasing.	
Resistance to antibiotics at non-dairy farms	No abnormalities.	

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 – rapid identification of health problems on the one hand and monitoring trends and developments on the other. Together, we team up for animal health, in the interests of animals, their owners and society at large.