Monitoring ANIMAL HEALTH

Erysipelas: increased risk in autumn and winter months

Erysipelas is a disease caused by the bacteria *Erysipelothrix rhusiopathiae*. It is a serious disease which can cause high mortality among chickens (layers, breeding animals) and turkeys. In the acute form, an erysipelas infection can result in sepsis in poultry within 2 to 5 days. Infected animals die quickly, with mortality rates up to 25 percent. Internally, the severely swollen liver and spleen are particularly noticeable. The disease is associated with a significant production drop in layers. In chronic cases, coordination problems and skin damage are often noticed, with slightly increased losses. Chronic cases have been documented in turkeys. In the first quarter of 2021 in the Netherlands, a veterinary practice and GD discovered the bacteria in layers suffering from inflamed eyelids. In countries with a lower biosecurity status, there is a high incidence of *Erysipelothrix rhusiopathiae* in broilers and this can even reach 80 percent in (seemingly) healthy animals. Such a situation would result in serious public health issues in the Netherlands. Ambient infection can take place via (winged and crawling) insects and small rodents. The spreading of contaminated manure on grasslands has also been identified as a possible source of infection. Contamination may persist at farms due to infected poultry mites, and infected rats and mice.

Erysipelas can be transmitted to other types of animals, but also to humans. During post mortem inspection of dead animals, there is a risk of becoming infected, for instance in the case of a scratch caused by a sharp bone fragment. This will initially result in a skin rash, inflammation of the lymphatic vessels and the lymph nodes. Within a week, this can develop into sepsis. Therefore, a medical professional should always be consulted. Various mammals can carry the bacteria, thereby serving as the reservoir from which outbreaks can be initiated.

On assessing the monitoring results of the past decades, outbreaks of erysipelas in poultry are shown to mainly occur during the autumn months and early winter (fourth and first quarters of the year); in both free-range and barn flocks. This period corresponds with harvesting and the movements of (brown) rats and mice related to that.

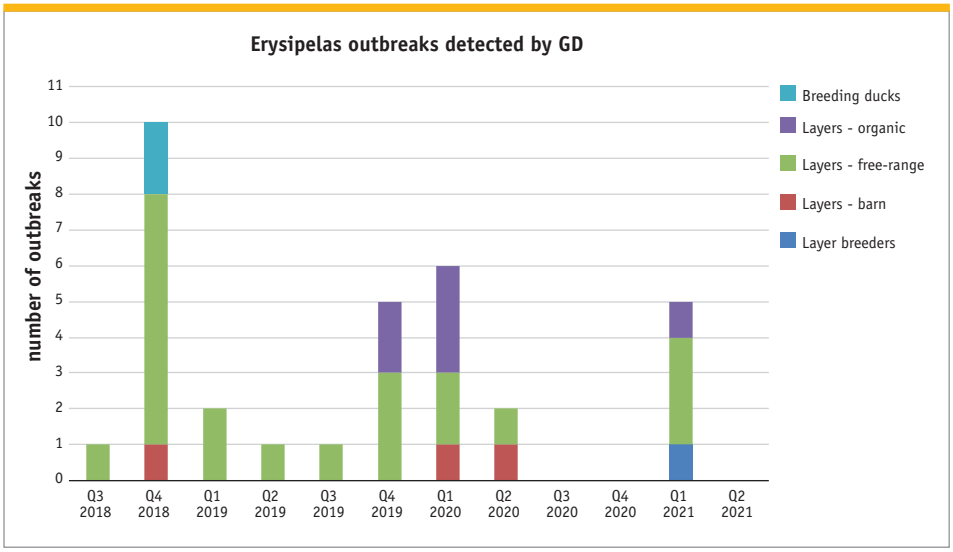


Figure 1. Number of outbreaks of erysipelas (at flock level), confirmed by GD (3rd quarter 2018 through 2nd quarter 2021) (Source: GD)

Given that vermin is often mentioned as a possible introduction route, it is probable that rats and mice, which can be carriers of the erysipelas bacteria, introduce the bacteria indoors, at the time of year when their outdoor food sources diminish and they seek shelter in the poultry houses. A number of chickens can pick up the bacteria from the vermin faeces and will die as a result of sepsis. Further spread throughout the house is caused by pecking and cannibalism of carcasses.

With a view to the time of year, we advise that pest control is optimised over the course of the autumn, and possibly even intensified when necessary. Farms which have already suffered an outbreak before, are advised to keep a close check on pest control and poultry mites, and to vaccinate the flocks for at least three consecutive years. This period may actually be too short for free-range farms, due to the prolonged survival of the bacteria in the soil.

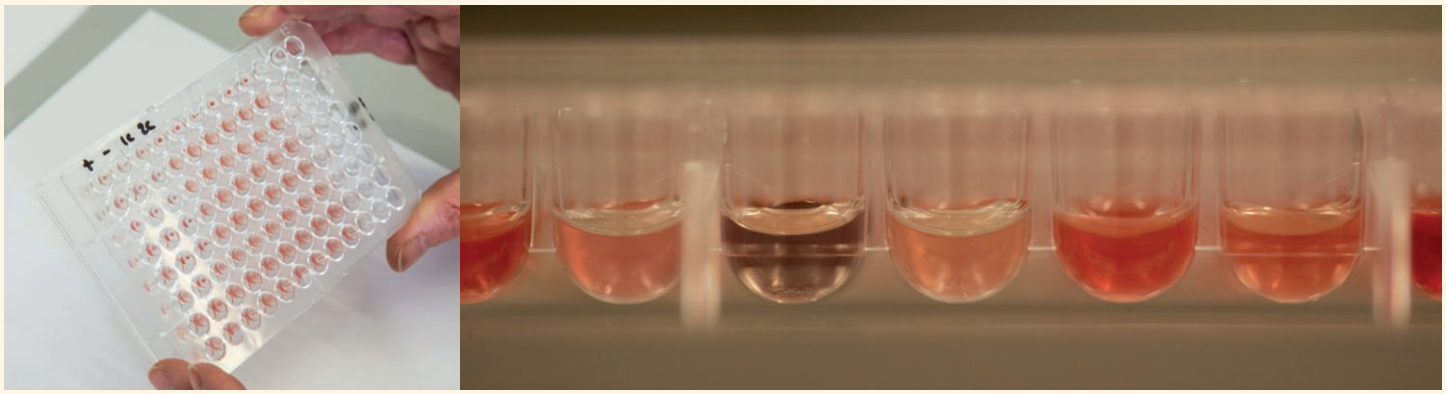
New legislation for plan of action for Newcastle Disease (PoA)

Newcastle Disease (ND) is one of the diseases designated in the '(EU) Directive 2016/429' as a disease for which EU countries must establish rules for prevention and control. The Netherlands has specified this European obligation in implementation obligations in the 'Rules for animal husbandry', which took effect on 21 April 2021.

The obligations actually already existed prior to 21 April 2021. Until then, they were recorded in the 'Rules for prevention, control and monitoring of infectious animal diseases and zoonoses and TSEs'. As of 21 April 2021, the former rules were replaced by the 'Rules for animal husbandry', whereby a number of changes were made to the prevention strategy.

Under the previous rules, broiler farms were obliged to formulate a plan of action (PoA) in the event of a single set of inadequate ND-HI results (failure to achieve the low titre requirement, i.e. at least one of the examined blood samples had an HI titre higher than or equal to 3), in order to achieve adequate results in the following flock; under the new rules, this is only necessary once the ND-HI titre is inadequate in two consecutive flocks. However, this plan must then be implemented in the next six flocks, rather than the two flocks required by the previous rules. Under the new rules, all ND-HI results of these six flocks must comply with the titre requirement. If this is not the case, a revised PoA must be formulated for the next six flocks.

The purpose of all these requirements is to induce effective group immunity (vaccination blanket) throughout the Dutch poultry farming sector and to enable the implementation of additional vaccination in case of emergencies, without causing disease and welfare issues.



A test plate, showing the sediment visible after executing the HI test. When there are insufficient or no antibodies in the dilution, the red blood cells will clump.

Salmonella Pullorum in layers

A *Salmonella* Pullorum infection was diagnosed in layers in June. The hens were submitted for post mortem examination due to reduced feed consumption, reduced production, bloating and nervous symptoms such as torticollis. At the time of their submission, losses were slightly raised, but increased sharply to 2.5 percent per week in the following weeks. Additional bacteriological testing showed the losses to have been caused by *Salmonella* Pullorum. Necropsy showed swelling of the spleen and liver, and occasional green discolouration of the liver, while the ovaries were non-productive, with multiple hens suffering from stenosis in the follicles and inflamed follicles. Salmonella was cultured from the follicles. Cultures of the liver and spleen proved negative, the anomalies in these organs were caused by obstruction, as part of an inflammatory reaction.
According to EU trade regulations, *Salmonella* Pullorum must be actively controlled in breeding poultry in order to prevent vertical transmission (transfer from parent stock to offspring via the egg). In layers or backyard poultry, *S.* Pullorum is found once or twice a year. Following a number of cases over the past years, five *S.* Pullorum isolates, sourced from a number of cases, have been characterized by whole genome sequencing. Three isolates were of the same genotype, while the remaining two isolates were each of a different genotype. Of the three comparable isolates, two were isolated from backyard poultry belonging to different owners, in the same year. The third isolate came from commercial layers in the same region as one of the backyard flocks. However, this case occurred a number of years later. A direct relationship is unlikely, as the first (backyard) flocks were euthanised at the time in order to prevent further spread. However, we cannot rule out the possibility of a source of *S.* Pullorum in the vicinity. (Asymptomatic) carriers are an important source of *S.* Pullorum infections. Besides vertical transmission, horizontal transmission is possible (from animal group to animal group, in some cases via carry-over or vectors). Not only chickens and turkeys but also partridges, quail, pheasants, sparrows, parrots, canaries and bullfinches may be carriers of *S.* Pullorum.

Antibiotic susceptibility

In order to assist with the decision on whether to treat with antibiotics at a farm and to keep a close check on trends and developments, the antibiotic susceptibility of the most commonly occurring pathogens in poultry is monitored. This takes place in collaboration with veterinary practices, to determine the antibiotic susceptibility of strains of bacteria found during GD necropsies and at veterinary practices throughout the country. These overviews are updated every six months and can be found in the monitoring reports and on the GD website (www.gddiergezondheid.nl/Diergezondheid/Antibioticumgevoeligheid/Pluimvee). The tables show the percentage of strains of bacteria resistant to the various antibiotics. The MIC distributions are also given. These distributions provide more detailed information and allow for earlier detection of trends and developments. By using a micro-broth dilution test, the MIC value can be determined. MIC stands for Minimum Inhibitory Concentration, i.e. the lowest concentration of the antibiotic required to inhibit the growth of the bacteria. Clinical breakpoints are applied in order to translate this value into 'susceptible' or 'resistant'. A clinical breakpoint translates a value of µg/ml into a probability of a positive or negative clinical reaction upon treatment with the prescribed dose of the antibiotic in question. The clinical breakpoints applied by GD are based on the current level of knowledge and may therefore change as insight increases.

The susceptible of, for example, the *E. coli* bacteria has been monitored for a number of years, which now allows us to give a time-based trend, as in the figure below.

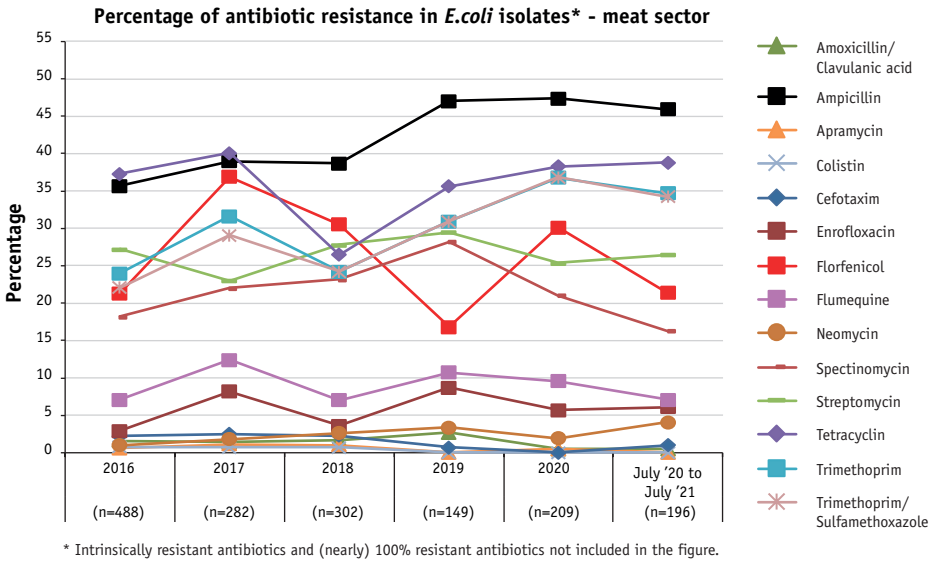


Figure 2. Percentage of antibiotic resistance *E. coli* isolates (meat sector) (2016 through July 2021) (Source: GD)

Animal health barometer for poultry 2nd quarter 2021

Disease/disorder/ health characteristic	Brief description (numbers at farm level)	Category*	1st quarter 2021	2nd quarter 2021	3rd quarter 2021	4thquarter 2021	Trend (OVER 2 YEARS)
Execution decree (EU) 2018 /1882 of the Animal Health Regulation (AHR) (EU) 2016 /429 (Category A disease)							
Avian influenza in the Netherlands (H5/H7) (Source: GD, WBVR, national government)	**Highly pathogenic AI (H5/H7):**	A+D+E	**H5N8:** 2 farms, 2x backyard poultry	**H5N8:** 1 farm, 2x backyard poultry			⬆
	Serology (first detection in flock): (Antibodies for H5/H7)		**H5N2:** 1 farm	Not detected			-
ND in the Netherlands (Source: GD, OIE)	Commercial poultry	A+D+E	Not detected				-
Execution decree (EU) 2018 /1882 of the Animal Health Regulation (AHR) (EU) 2016 /429 (Categories B through E)							
Campylobacteriosis	No data available	D+E	-	-			N/A
Avian influenza in the Netherlands (H5/H7) (Source: GD, WBVR, national government)	**Low pathogenic AI (H5/H7):**	D+E	Not detected	Not detected			-
Avian mycoplasmosis (Source: GD)							
M. gallisepticum[A]	**Serological monitoring by GD:**	D+E					
	Reproduction sector:		0 farms	0 farms			-
	Layer pullets:		0 farms	0 farms			-
	Layers:						
	- not vaccinated and infected:		0 farms	5 farms			⬆
	- vaccinated and infected:		1 farm	4 farms			⬇
	Turkeys:		0 farms	0 farms			-
	Reports in EWS[C] based on positive serology and/or voluntary PCR testing:						
	Layers:		2 farms	6 farms			-
	Backyard poultry		-	3 cases			⬆
M. meleagridis (Source: GD)		D+E	N/A	N/A			
Salmonellosis (non-zoonotic salmonella) (Source: GD)							
Salmonella arizonae		D+E	N/A	N/A			N/A
Salmonella Gallinarum (SG)		D+E	Not detected	Not detected			-
Salmonella Pullorum (SP)		D+E	Not detected	Not detected			-
West Nile fever	Not monitored	E					

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Table continuation

⬆ Increase or strong increase
⬆ Limited increase
- Situation unchanged
⬇ Limited decrease
⬇ Decrease or strong decrease

A Based on serological monitoring
B Based on serological monitoring and/or the differentiating M.s.-PCR
C Early Warning System

Disease/disorder/ health characteristic	Brief description (numbers at farm level)	Category*	1st quarter 2021	2nd quarter 2021	3rd quarter 2021	4th quarter 2021	Trend (OVER 2 YEARS)
Article 2.1 Designation of animal diseases 'Rules for Animal health' of the Dutch Animal Act							
Avian chlamydiosis (Source: GD)		D+E	Not detected by GD	Not detected by GD			-
Article 2.2 Article 2.1 Designation of zoonoses 'Rules for Animal health' of the Dutch Animal Act							
Salmonellosis (zoonotic salmonella) (at the flock level) (Source: NVWA)							
S. Enteritidis	Reproduction:		1 flock	2 flocks			-
	Layer pullets:		0 flocks	0 flocks			-
	Layers:		5 flocks	8 flocks			↓
S. Typhimurium	Reproduction:		3 flocks	0 flocks			-
	Layer pullets:		0 flocks	0 flocks			-
	Layers:		0 flocks	0 flocks			-
Other types of salmonella (*S.* Hadar, *S.* Infantis, *S.* Java, *S.* Virchow)	Reproduction:		0 flocks	0 flocks			-
Other OIE-list poultry diseases in the Netherlands subject to compulsory notification							
Infectious laryngotracheitis (ILT) (Source: GD; EWS)	**Reported in EWS[C]:**						
	Broilers:		1 farm	0 farms			-
	Backyard poultry:		1 case	1 case			-
M. synoviae[B] (Source: GD)	**Serological monitoring and/or dPCR by GD:**			**% of positive farms versus farms tested**			
	Grandparent stock (incl. pullets) (meat):		0%	0%			-
	Broiler breeder pullets:		4%	24%			-
	Broiler breeders:		11%	31%			↑
	Reproduction sector - laying (incl. rearing, except rearing layers):		0%	0%			-
	Layer breeders:		3%	2%			-
	Layer pullets:		27%	11%			↓
	Layers:		73%	74%			-
	Turkeys:		19%	4%			-
Infectious bronchitis (IB) (Source: GD)	**Types most commonly detected by GD:**						
	Broilers:		D388	D388			
	Layers:		4-91/D181	D181			
Gumboro (IBD) (Source: GD; EWS)	**Reported in EWS[C]:**						
	Broilers:		5 farms	6 farms			↓
Turkey Rhinotracheitis (TRT) (Source: GD)	**Detected by GD:**						
	Broilers:		2 farms	6 farms			
	Layers		1 farm	0 farms			

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Table continuation

↑ Increase or strong increase
↑ Limited increase
- Situation unchanged
↓ Limited decrease
↓ Decrease or strong decrease

A Based on serological monitoring
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C Early Warning System

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Disease/disorder/ health characteristic	Brief description (numbers at farm level)	Category*	1st quarter 2021	2nd quarter 2021	3rd quarter 2021	4thquarter 2021	Trend (OVER 2 YEARS)
Other poultry diseases							
Erysipelas (*Erysipelothrix rhusiopathiae)* (Source: GD)	**Detected by GD: (new infections):**						
	Layer breeders:		1 farm	0 farms			-
	Layers:		4 farms	0 farms			↓
Histomonosis (Source: GD)	**Detected by GD:**						
	Reproduction (meat sector):		8 farms	0 farms			↑
	Layer pullets:		2 farms	2 farms			-
	Layers		0 farms	2 farms			-
Avibacterium paragallinarum (Source: GD; EWS)	**Reported in EWS[c]:**						
	Layers:		3 farms	4 farms			↓
	Backyard poultry:		2 cases	6 cases			↑
Pasteurella multocida (Source: GD)	**Detected upon necropsy:**						
	Layer pullets		1 farm	0 farms			-
	Layers:		2 farms	0 farms			↓

Monitoring DIERGEZONDHEID

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 issues 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.