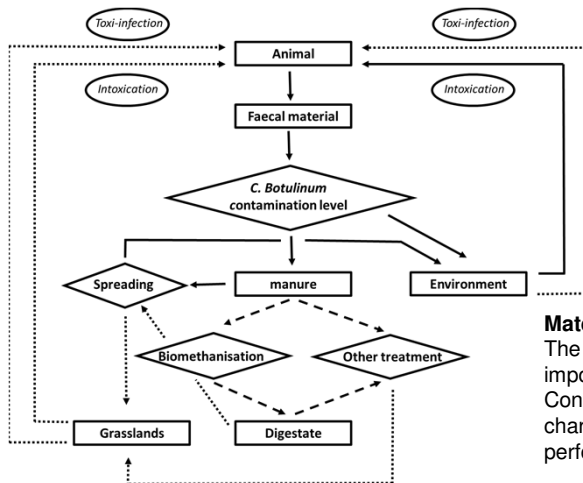


# Risk associated to the spreading of manure and digestate contaminated by *Clostridium botulinum* (type D)



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Solid arrow : pathway identified as the most probable for contamination  
Spaced line arrow : pathway identified as intermediary for contamination  
Dashed arrow : pathway identified as the least probable for contamination

## Background

An outbreak of botulism (*Clostridium botulinum* type D) in cattle has occurred in a holding using manure in its biomethanisation plant. The byproduct of the biomethanisation process is usually used as fertilizer on both arable and grass lands. The Scientific Committee instituted by the FASFC (SciCom) has been requested to evaluate the animal health risks associated with the spreading of manure or digestates contaminated with *Clostridium botulinum* toxinotype D. Specific questions have been formulated.

## Material & methods

The qualitative risk assessment was based on the method of the OIE (risk at importation) as well as the ANSES methodology in animal health (2008). Considering literature data and a risk pathway model, risk identification, risk characterization (estimation of release, exposure and consequences) were performed qualitatively from expert opinions.

## Results

The main risk pathway for animal health is associated to the increase in spore concentration in the environment of the cattle. Based on estimations on **release** (nil to extremely low) and **exposure** (very low), the occurrence probability was assessed as 'very low'. **Consequences**, limited to the only contaminated farm from the animal health point of view, were assessed as 'marginal'. The **risk** was therefore estimated by the SciCom as '**very low**'. Even if clinical case in the field are eventually under-diagnosed and/or under-notified, numbers for incidence rates show that clinical cases in cattle remain rare events (see the table contra), and this even the intensive use of both manure and digestates for the fertilization of arable lands or grasslands.

Incidence rate for clinical cases of bovine botulism as inferred from notifications to FASFC and from positive samples (diagnostic) at the National Reference Laboratory (Sciensano) (Source: Opinion 26-2017 of the Scientific Committee instituted by the FASFC).

	Année							Référence
	2010	2011	2012	2013	2014	2015	2016	
Nombre de bovins en Belgique	2509540	2471600	2438180	2441320	2477240	2503260	2501350	Eurostat
Nombre de troupeaux de bovins en Belgique	37000	35062	32856	31680	30354	29468	28486	Requête dans la banque de données de l'AFSCA
Cas de botulisme bovin notifiés à l'AFSCA (# d'animaux)	13	11	10	34	50	33	105	Données AFSCA
Cas de botulisme bovin notifiés à l'AFSCA (# de foyers = # de troupeaux infectés)	4	1	2	7	2	8	5	Données AFSCA
Echantillons positifs soumis pour diagnostic de botulisme bovin à l'ISF (LNR) <sup>a</sup>	20	20	24	25	11	16	5	Trends and Source 2012-2013
Taux d'incidence de botulisme / bovin (sur base des notifications de l'AFSCA)	5,1802 x10 <sup>-6</sup>	4,4506 x10 <sup>-6</sup>	4,1014 x10 <sup>-6</sup>	1,3927 x10 <sup>-5</sup>	2,0184 x10 <sup>-6</sup>	1,3183 x10 <sup>-6</sup>	4,1977 x10 <sup>-6</sup>	
Taux d'incidence de botulisme / bovin (sur base des échantillons positifs de l'ISF)	7,9696 x10 <sup>-5</sup>	8,0919 x10 <sup>-5</sup>	9,8434 x10 <sup>-5</sup>	1,0240 x10 <sup>-4</sup>	4,4404 x10 <sup>-5</sup>	7,1906 x10 <sup>-5</sup>	1,9989 x10 <sup>-5</sup>	
Taux d'incidence de botulisme / troupeau de bovin	1,0811 x10 <sup>-1</sup>	2,8521 x10 <sup>-2</sup>	6,0872 x10 <sup>-2</sup>	2,2096 x10 <sup>-1</sup>	6,5889 x10 <sup>-2</sup>	2,7148 x10 <sup>-1</sup>	1,7552 x10 <sup>-1</sup>	

<sup>a</sup> différents échantillons peuvent provenir d'un seul animal

## Conclusions

Although the risk associated with manure or digestates contaminated by *C. botulinum* has been assessed as 'very low' by the Scientific Committee, recommendations based on **measures minimizing the environmental contamination should prevail** (Opinion 26-2017 of the SciCom). The conclusions and the recommendations formulated in the opinion are valid for *C. botulinum* toxinotypes C or D. The risk needs to be re-evaluated in the case of an outbreak with *C. botulinum* toxinotype B or any other (than C or D) toxinotype of *C. botulinum*.

## Recommendations

- For future suspected outbreaks of botulism: blocking of animal by-products until identification of the toxinotype. If toxinotype B: no manure or potentially contaminated digestate should be used on pasture or crops; if toxinotypes C, D, C-D or D-C: contaminated manure should be preferentially destroyed by incineration or treated with lime before being spread (on crops).
- Good practices (production, storage, distribution) for silage production. Avoidance of poultry manure in cattle environment.
- For biomethanisation: carry out of the hygienisation step in pre-digestion.
- Systematically include botulism in the differential diagnosis of progressive and ascending flaccid paralysis, digestive disorders or sudden mortality in cattle. Notify all suspicions.

