



S. Cardoen <sup>1</sup>, S. Quoilin <sup>2</sup>, G. Ducoffre <sup>2</sup>, H. Imberechts <sup>3</sup>, L. Herman <sup>3</sup>, D. Berkvens <sup>3</sup>, R. Ducatelle <sup>3</sup>, C. Saegerman <sup>4</sup>, L. Vanholme <sup>5</sup>, X. Van Huffel <sup>1</sup> and K. Dierick <sup>2,3</sup>.

<sup>1</sup> Scientific secretariat of the Scientific Committee of the Federal Agency for the Safety of the Food Chain (FASFC) – Belgium; <sup>2</sup> Scientific Institute of Public Health – Belgium; <sup>3</sup> Scientific Committee of the FASFC – Belgium; <sup>4</sup> University of Liège – Belgium; <sup>5</sup> Directorate-general Control Policy of FASFC – Belgium.  
Corresponding author: sabine.cardoen@asfca.be

## Introduction

The purpose of this study is to prioritize food-borne zoonoses, by using all existing Belgian data, in order to give recommendations to the authorities to allow establishing monitoring programmes. Water-borne zoonoses are also considered food-borne since drinking water is defined as food in Regulation 178/2002/EC.

## Methodology: semi-quantitative approach

### 1. List of agents of food-borne zoonoses (including potential zoonoses)

Bacteria		Virus	Parasites	
<i>Aeromonas</i> spp.	<i>Helicobacter</i> spp.	Lymphocytic choriomeningitis virus	<i>Anisakis simplex</i>	<i>Sarcocystis sui hominis</i>
<i>Arcobacter butzleri</i>	<i>Leptospira</i> spp.	Norovirus	<i>Ankylostoma</i> spp., <i>Strongyloides</i> spp.	<i>Sarcocystis bovis hominis</i>
<i>Bacillus anthracis</i>	<i>Listeria monocytogenes</i>	Central European tick-borne encephalitis virus	<i>Balantidium coli</i>	<i>Taenia saginata</i>
<i>Brucella abortus</i>	<i>Mycobacterium bovis</i>	Influenza virus H5N1	<i>Capillaria</i> spp.	<i>Taenia ovis</i> , <i>T. multiceps</i> , <i>T. hydatigena</i>
<i>Brucella melitensis</i>	<i>Mycobacterium avium subsp avium</i>	Hepatitis A virus	<i>Clonorchis sinensis</i>	<i>Toxoplasma gondii</i>
<i>Campylobacter coli</i> and <i>jejuni</i>	<i>Mycobacterium avium subsp paratuberculosis</i>	Hepatitis E virus	<i>Cryptosporidium parvum</i>	<i>Trichinella</i> spp.
<i>Campylobacter (Vibrio) fetus</i>	<i>Salmonella</i> spp.	Rotavirus	<i>Diocotophyma renale</i>	<i>Trichostrongylus</i> spp.
<i>Clostridium botulinum</i>	<i>Staphylococcus aureus</i>		<i>Diphyllobotrium</i>	
<i>Clostridium perfringens</i>	<i>Streptococcus</i> spp.		<i>Echinococcus granulosus</i>	
<i>Corynebacterium ulcerans</i> and <i>bovis</i>	<i>Vibrio cholerae</i>		<i>Echinococcus multilocularis</i>	
<i>Coxiella burnetii</i>	<i>Vibrio parahaemolyticus</i>		<i>Fasciola hepatica</i>	
<i>E. coli</i> O157:H7	<i>Yersinia enterocolitica</i>	<b>Other</b>	<i>Giardia intestinalis</i>	
<i>Francisella tularensis</i>	<i>Yersinia pseudotuberculosis</i>	PrP protein	<i>Linguatula serrata</i>	

### 2. Establishment of five general criteria and help criteria based on set of Belgian data

5 general criteria	Help criteria
<b>Public health</b>	
1. Gravity for humans	Clinical signs, hospitalization (sometimes) necessary, absence of treatment/vaccine, medical intervention (sometimes) necessary, possibility of complications, possibility of grouped cases, YOPIs only, risk of mortality, classification Belgian Biosafety server
2. Incidence humans in Belgium	- Data of incidence in Belgium in 2003, 2004, 2005 and 2006 from annual reports of Sentinel and Reference Laboratories (Scientific Institute of Public Health) - Data from Handistatus II (OIE) (Belgium, Europe, world)
<b>Animal health</b>	
3. Incidence in live animals	- Registered cases in Belgium in 2003, 2004, 2005 (reports Trends and Sources Belgium, Handistatus II (OIE)), - Epidemiological situation (endemic, sporadic, epidemic, emergent), - Geographical repartition (world, Europe)
4. Gravity + Economical and commercial impact for sector	- Gravity animal (Belgian Biosafety Server), multispecies reservoir, contagious - Existence of a risk at importation, important economic consequences for sector
<b>Food</b>	
5. Incidence food / slaughterhouse	Incidence in food (2003, 2004, 2005) or in carcasses at slaughterhouse (2003, 2004, 2005) (reports Trends and sources Belgium)

### 3. Expert scores: for each zoonosis, estimation of the importance of each of the 5 general criteria using the help criteria by giving points (0, 1, 2, 3, 4, ND or ?)

Significance	Gravity	Incidence
<b>Existence of data</b>		
0	benign	absence
1	weak	rare
2	moderate	moderate
3	severe	significant
4	mortal / no treatment	high
?	expert does not agree with data; scoring not possible	expert does not agree with data; scoring not possible
<b>Lack of data</b>		
ND	no data	no data

### 4. Prioritization by adding, for each zoonosis, the points of the five general criteria according to the expert scores → score for each zoonosis (0 - 20 points) → ranking

## Conclusions and perspectives

- Semi-quantitative approach based on expert scores
- Preliminary results with nine experts: validation of methodology
- Extension to 30+ experts
- Development of statistics and quantification of uncertainty
- Weighting of criteria by FASFC DG Control Policy
- Extension to zoonoses other than food-borne (direct transmission, vector-borne) and to animal diseases: need for other criteria, use other weighting