



Public health risk associated to raw meat-based diets (RMBD) for cats and dogs

Follow-up on the emerging issue ID0419

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TO RECALL

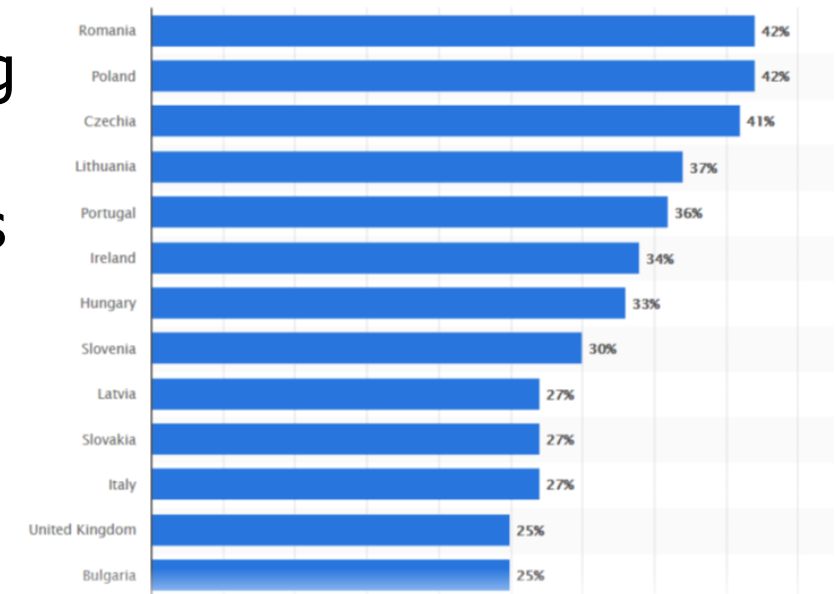
- 2017 Report of EFSA's activities on emerging risk
 - ID 380 *Brucella suis* in a pet dog in the Netherlands (2016)
 - the dog contracted a *B. suis biovar 1* infection by eating raw meat which contained raw heads of hare from Argentina
- EFSA recommendations
 - discuss the re-use of ABP
 - to investigate further the risk pathway

- RMBD (Raw Meat Based Diet) and BARF diets (Biologically Appropriate Raw Food or Bones) for pet diets contain raw muscle meat, organ meats, fat, cartilage and bones.
- feeding RMBDs to companion animals has become increasingly popular
- RMBD can be home-prepared or commercially prepared
- the claimed health benefits attributed to the feeding of RMBDs are mostly anecdotal
- increased risk of exposure to zoonotic bacteria and parasites



The driver: the EU household dog population

- Pet adoption across EU countries is increasing
- an estimated 90 million European households (46%) own at least one pet animal
- at least 24% own one dog and at least 25% own one cat.



Share of households owning at least one dog in the European Union in 2018, by country (Statista, 2019)

The driver: the raw pet food sector is growing

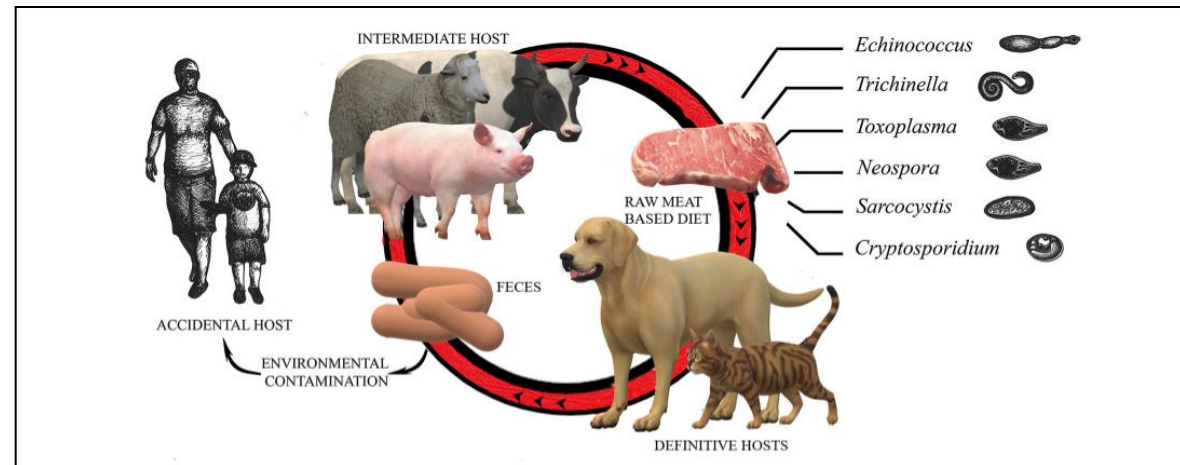
- Pet humanization plays a crucial role in raw pet food adoption
- 60% of pet owners feed their cats and dogs completely or partially RMBD and this practice is popular in several European countries
- Related market expected to reach a valuation of US 36,4 billion in 2023
- RMBD now accounts for roughly **10% of the pet food market in Finland**, 5% in Germany, around 3% in the UK, and nearly 2% in the US
- in the UK, there are over 50 producers of raw pet food, and 30 in the Scandinavian countries.

- RMBD contamination with zoonotic bacterial pathogens could pose a concrete risk to pets and to the people handling raw meat products together with the **challenge of fecal shedding by infected pets**

- *E. coli* (serotype O157:H7)
- ***Salmonella* (5-80%)**
- *Clostridium*
- *Listeria monocytogenes*
- *Campylobacter*
- *Brucella suis*
- *Echinococcus granulosus*
- *Sarcocystis*
- *T. gondii*

Potential magnification of parasitic burden in case of consumption of contaminated RMBD by domestic cats and dogs

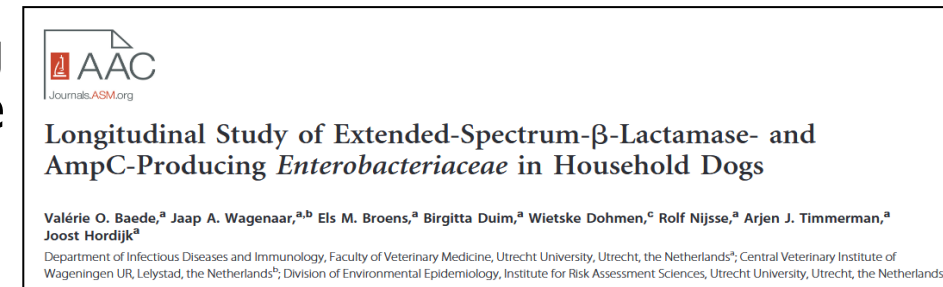
ONE HEALTH principle



Fahad Ahmed et al.. One Health 13 (2021) 10032. Review

- Parasites: RMBD may represent a route of exposure to the increased risk of environmental load.

- The presence of AMR bacteria (including extended-spectrum beta-lactamases (ESBL)-producing *E coli*) has also been demonstrated in RMBDs
- Sweden: 23% of the tested RMBD samples found positive for extended-spectrum cephalosporins-producing *E coli*.
- Netherlands: shedding of ESBL-producing *enterobacteriaceae* was more likely in dogs that ate raw meat.
- **Pet considered to be a risk factor for infection with ESBL-producing bacteria in human beings**



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 - 35 commercial frozen RMBDs from eight different brands
 - 80% Extended-spectrum beta-lactamases-producing E coli
 - 23% Escherichia coli serotype O157:H7 (pet asymptomatic carriers)
 - 54% Listeria monocytogenes
 - 43% other Listeria species
 - 20% Salmonella species
 - 11% Sarcocystis cruzi
 - 11% S.tenella
 - 6% Toxoplasma gondii




- The Netherlands. a recent study in reported *Salmonella* isolation from 20% of 35 commercial raw food samples (van Bree *et al.* [2018](#)),
- Italy: pork and chicken material available for pet food manufacture yielded *Salmonella* from 12% of samples (Bacci *et al.* [2019](#)).

- In a study conducted in Brasil in 2020 dogs given RMBD were almost 30 times more likely to have *Salmonella* than dogs on a conventional diet
- *Salmonella enterica* with serovars Thyphimurium, Heildelbeg Saint Paul associated to human salmonellosis
- dogs were also more likely to have other infection such C. perfringens and toxigenic *Clostridioides (Clostridium) difficile*
- majority of Salmonella were resistant to one to seven different classes of antimicrobial

PLOS ONE

RESEARCH ARTICLE

Fecal shedding of *Salmonella* spp., *Clostridium perfringens*, and *Clostridioides difficile* in dogs fed raw meat-based diets in Brazil and their owners' motivation

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Abstract



- AMR bacteria were found in **62.7%** of the samples, bacteria resistant to 3d generation cephalosporins (due to extended-spectrum β -lactamases (ESBLs), colistin and aminoglycoside.
- *Escherichia coli* emerging extraintestinal pathogenic clonal complexes CC648(ExPEC) major pathogenic agent causing disease worldwide

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Research



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Raw meat-based diets for companion animals: a potential source of transmission of pathogenic and antimicrobial-resistant Enterobacteriaceae

- raw feed a risk factor for household cats to shed ESBL-producing **Enterobacteriaceae**
- significant association was found between ESBL shedding and feeding raw pet food products (OR=31.5).



RESEARCH ARTICLE

Raw pet food as a risk factor for shedding of extended-spectrum beta-lactamase-producing *Enterobacteriaceae* in household cats

- 2020: outbreak of feline tuberculosis in England and Scotland was possibly linked to BARF feeding
 - *Conor O'Halloran et al.. 2021 Transbound Emerg Dis 2021 Jul;68(4):2308-2320*
 - previous report by O'Halloran, Gunn-Moore, et al., 2018; O'Halloran et al., 2019).
- 47 cats presented clinical tuberculosis (pyo-granulomatous lesions, lymphadenopathy, pulmonary and/or alimentary disease) while another 83 in-contact cats were found to have positive IGRA responses consistent with MTBC infection but no active disease
- *M. bovis* infection was suspected or definitively diagnosed (n = 5)
- cats all consumed the same specific brand of commercial raw pet food (deer meat?)



- UK is facing an alarming increase in the presence of *Salmonella* in RMBD with a significant risk to both animals and humans.
- the number of positive cases of *Salmonella* in pet food has risen and surpassed the record levels seen in the previous year: 406 in 2002- 295 in 2021
- most common serovars reported: *S. Indiana*, *S. Infantis*, *S. Typhimurium*, *S. Derby*, *Salmonella* 4,12:i.
- presence of multi-drug-resistant strains, including those resistant to CIAs, in dogs, cats, and raw pet food.



Animal &
Plant Health
Agency

Salmonella in animals and feed in Great Britain

2022

September 2023

- From human side
 - UK Health Security Agency (UKHSA), Public Health Wales, and Public Health Scotland (2022) reported:
 - human cases of *Salmonella*
 - 64% increase in compared to 2021
 - 72% increase compared to 2020
 - most prevalent types: *Salmonella enteritidis*, *typhimurium*, *infantis*, *newport*, and *mbandaka*
 - same strains of *Salmonella* isolated in pet food and animal feed caused the doubling of human cases compared to 2021.

- human clinical disease associated with exposure to raw-fed pets and their food is likely to occur as **sporadic and isolated cases** rather than in outbreaks
- outbreak due to Shiga toxin producing *Escherichia coli* (STEC) O157:H7 attributed to exposure to contaminated raw pet food (Public Health England-PHE, 2018)
- human illnesses are probably under-reported (mostly attributed to foodborne outbreak)
- foodborne illnesses in dogs and cats fed of contaminated home-prepared RMBDs are rarely tracked unless associated with human disease.

- pet owners feeding raw may be taking additional precautions when handling the raw food, reducing their personal risk of illness
- importance of handling and preparing pet food with caution to prevent the spread of bacteria.



- The RMBDs is an emerging public health risk?
- Risk assessment
 - microbiological monitoring of RMBD for bacterial pathogens and AMR bacteria (info from EU limited)
 - understand the extent of the human exposure through targeted and systematic monitoring of households may yet be needed to quantify the human health hazards of raw feeding,
- Risk mitigation
 - lack of pasteurization raises questions regarding bacterial contamination
 - Raw pet food (as ABP Category 3 which are fit but not intended for human consumption) are subjected to strict microbiological hygiene criteria set by ABP regulations 1069/2009 and 142/2011
 - critical nature of veterinary meat inspection to maintain safety of raw pet food for human and animals
 - to promote awareness and education campaigns on safe handling RMBDs to avoid

- concerns about the transmission of pathogens from RMBD to pets and humans with **potential spillover to livestock** if proper hygiene measures are not followed
- practice to feed RMBD diets largely overlooks the potential health-threatening consequences to household pets and owners
- data on public health risks of raw feeding are fragmentary, but they are increasingly forming a compelling body of formal scientific evidence
- important that veterinary and public health practitioners and organizations continue to communicate this to both consumers and producers of raw pet food
- **A One Health approach** (animal, human and environment) is of relevance for **mitigating and tackling bacterial and parasitic infections** with safeguarding human health and for safe feeding of pets.