

## ADVISORY COMMITTEE ON THE MICROBIOLOGICAL SAFETY OF FOOD

### RAW PET FOOD

#### Background

Raw pet foods are also commonly referred to as raw meat-based diets (RMBDs) or bones and raw feeding (BARF)<sup>1</sup> and is a rapidly growing sector in the UK and beyond, particularly for dogs and to a lesser extent for cats. Stereotypes of the typical profile of raw pet food feeders are cited as being well educated and middle class or part of 'the country set', building on the association with ancestral wild animal and more natural diets.<sup>2</sup>

As to the scale of the market in the UK, it is estimated that the raw pet food sector is worth £2.7bn<sup>3</sup>, albeit comprising <5% of the total pet food sector. In the USA, sales of raw pet food have doubled over the last five years, now approaching a turnover of \$200 million (£137 million)<sup>4</sup>. In the Netherlands for example, approximately fifty percent of pet owners feed their dogs entirely or partially with raw meat-based products.<sup>5</sup> However, as no formal kill-step is incorporated into the production of raw pet food, there remains the potential risk of microbiological contamination in the final marketed product.

Over the last year especially, the British Veterinary Association has repeatedly published articles on the broad issues associated with animal and public health risks, largely associated with microbiological concerns from raw petfoods.<sup>5,6,7,8,9,10,11,12</sup>

#### FSA Incidents on raw pet food

Animal Feed Branch co-ordinates risk assessments and risk management decisions for the FSA. The frequency and broad categorisation of raw pet food Incidents is presented in Table 1 in context of total feed incidents below, on an annual basis 2013

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<sup>1</sup> BARF is also occasionally a reference for 'biologically appropriate raw food'.

<sup>2</sup> Waters, A. (2017) Raw diets: are we at a turning point? [Veterinary Record 181, 384.](#)

<sup>3</sup> Pet food firm Natures Menu shows strong growth ahead of £12m Snetterton factory move. [Eastern Daily Press](#) (3 Aug 2017).

<sup>4</sup> Raw pet food sales growing despite health warnings. <http://www.petfoodindustry-digital.com/201803/index.php#32>

<sup>5</sup> van Bree F. (2018). Zoonotic bacteria and parasites found in raw meat-based diets for cats & dogs [Veterinary Record 182, 50](#)

<sup>6</sup> Hinney, B. (2018) The trend of raw meat-based diets: risks to people and animals. [Veterinary Record 182, 47-49.](#)

<sup>7</sup> Davies, M. (2018) Health hazards associated with feeding raw foods. [Veterinary Record 182, 114.](#)

<sup>8</sup> Burns J. (2017). Raw feeding and the risks to people. [Veterinary Record 181, 149](#) and a responding position statement from the British Small Animal Veterinary Association (BSAVA).

<sup>9</sup> Frost, A. (2017) Feeding of raw *Brucella suis*-infected meat to dogs in the UK. [Veterinary Record 181, 484.](#)

<sup>10</sup> (2017) Raw feeding of pets: safe and nutritious – or reckless and irresponsible? [Veterinary Record 181, 386-387.](#)

<sup>11</sup> (2016) Raw food diets for dogs and cats: do we know enough? [Veterinary Record 178, 549-550.](#)

<sup>12</sup> World Small Animal Veterinary Association's Global Nutrition Committee (2015). WSAVA draws attention to risks of raw meat-based diets. [Veterinary Record 176, 451.](#)

to date) which includes Q.1 figures for 2018. This data includes domestic incidents as well as EU traded goods (i.e. imports into the UK and exports from UK producers).

**Table 1: FSA notifications of Raw Pet food Incidents <sup>a,b</sup>**

Contamination	2013	2014	2015	2016	2017	2018 <u>Q.1</u>
Microbiological	1		4	5	9	7
Physical					1	
Approvals non-compliance					1	1
Total – Raw Pet food	<b>1</b>	<b>0</b>	<b>4</b>	<b>5</b>	<b>11</b>	<b>8</b>
Total – Other Pet food	10	10	6	20	11	10
Total – Animal Feed [including all pet foods]	54	40	42	59	68	40

<sup>a</sup> Figures for raw pet food include fresh and frozen products, but excludes dried dog treats (e.g. pigs' ears) and lightly cooked products.

<sup>b</sup> Figures subject to finalisation.

For the last full year recorded in 2017, microbiological contamination was associated with the majority of raw pet food incidents (n=9/11); in contrast to the minority of incidents for other processed pet foods (n=2/11). A similar trend is observed for the first quarter of 2018, although total figures for Q.1 2018 are approaching annual figures for 2017. With the raw pet food sector comprising <5% of total pet food in the UK, this represents a disproportionately high frequency of incidents for raw pet food. In line with observations from the academic literature, *Salmonella* contamination in raw pet food has generally been the source of incident notifications; although other recognised pathogens have also been reported to the FSA (i.e. *Listeria*, *Brucella suis* and Shiga-toxin producing *Escherichia coli* - STEC).

### **Typical composition of raw pet foods**

Raw pet foods are predominantly marketed for dogs, although cats (and other pets) are also targeted. There exists a wide range of raw pet food products on the market, typically comprising meats (and bone in instances) as found in processed pet food (e.g. chicken, lamb or beef etc) or marketed for their offal content, such as duck hearts or tripe. Such raw products often contain secondary ingredients including fruit, vegetables, grains, oils, dairy products and other nutrients (vitamins, minerals etc).

However, more premium meat products may also be marketed as raw pet food (e.g., hare, horse, kangaroo, wild boar or venison) with many goods bilaterally traded across the EU. Raw pet food products are most commonly frozen, although dehydrated/freeze-dried or fresh forms are available. In addition, there are a number of lightly cooked/steamed products which raw pet food companies may also market, and it is recognised that such a production process may not meet kill-step criteria and consequently could still pose a microbiological risk. In the last year, dedicated freezers for raw pet food sales within food retail environments have been installed<sup>13</sup>, and raw

<sup>13</sup> Tesco becomes first UK retailer to offer complete range of fresh pet food <https://www.tescopl.com/news/news-releases/2017/tesco-to-launch-fresh-pet-food-range/>

pet food may be purchased for home delivery as part of online food deliveries<sup>14</sup>. These frozen products are typically sold in pouches, vacuum-packs, sausage-type tubes or sealed bags; often in single meals sizes, although bulk packs (of several kilograms) may be purchased. Frozen products typically have a durability date in excess of one year, and could be stored in domestic environments alongside frozen foodstuffs. Such developments may cause concern over the increased potential for direct contact with household groceries and contamination of foodstuffs for human consumption.

### **Microbiological profiles of raw pet food**

This section is based on the findings collated from two major research studies predominantly on zoonotic bacteria; one undertaken by the US Food and Drug Administration (FDA, 2010-11)<sup>15,16</sup> and the second study by Utrecht University in the Netherlands (2017)<sup>5</sup> which may serve as a proxy from a European perspective.

The US FDA undertook research into microbiological profiling of various pet foods, referred to as ‘The pet food study’. More than 1,000 samples were tested in two phases over a two-year period; with phase one on dry and semi-moist pet foods for cats and dogs (pouched, not canned), and phase two on raw pet foods for cats and dogs, jerky type treats and exotic animal feeds<sup>17</sup>. The pet foods were all tested for the presence of food safety pathogens including *Salmonella*, *Listeria*, *E. coli* O157:H7 (EHEC), and Shiga-toxin *E. coli* (STEC, non O157). Of the 480 phase one samples; only two tested positive; one for *Salmonella* and one for *Listeria greyii*, both in dry cat food. However, of the 576 samples analysed during Phase two, a total of 91 samples tested positive for the suite of pathogens tested, with the vast majority (n=88) depicted below in Table 2 for the 196<sup>17</sup> raw pet food samples tested:<sup>15,16</sup>

**Table 2: Microbiological results for raw pet food from the Pet Food Study (US FDA)**

<b>Pathogen</b>	<b>No. Positive</b>	<b>% of total tested</b>
<i>Listeria</i> [of which, <i>L. monocytogenes</i> ]	65 [32]	33% [16%]
<i>Salmonella</i>	15	7.5%
STEC (non-O157)	8	4%
<i>E. coli</i> O157:H7 EHEC	0	0%
<b>Total</b>	<b>88/196</b>	<b>45%</b>

In the recent study undertaken by van Bree *et al* at Utrecht University<sup>5</sup>, Dutch commercial raw meat-based diets (RMBDs) were analysed for the presence of four zoonotic bacteria and two parasite species. In this smaller study, a total of 35 commercial frozen raw pet foods representing eight of the larger market-share brands

<sup>14</sup> (e.g.) Ocado online <https://www.ocado.com/webshop/promotion/buy-any-5-cheapest-item-free/129086279>

<sup>15</sup> Nemser S.M. *et al* (2014). Investigation of *Listeria*, *Salmonella*, and Toxigenic *Escherichia coli* in Various Pet Foods. *Foodborne pathogens and disease*. 11 (9). DOI:10.1089/fpd.2014.1748

<sup>16</sup> US FDA. Get the Facts! Raw Pet Food Diets can be Dangerous to You and Your Pet. The Pet food study. <https://www.fda.gov/AnimalVeterinary/ResourcesforYou/AnimalHealthLiteracy/ucm373757.htm>

<sup>17</sup> NB: near equal share of samples were taken between feed matrices within each phase (i.e. In phase one, 120 samples per matrix and in Phase two; raw pet food (196), jerky treats (190) and exotic animal feed (190).

in the Netherlands were analysed for bacterial and parasitic contamination, as per Table 3:

**Table 3: Microbiological results for raw pet food from the Utrecht University study**

Pathogen	No. Positive	% of total tested
<b>Bacteria</b>		
<i>Listeria</i>	15	43%
<i>Listeria monocytogenes</i>	19	54%
<i>Salmonella</i>	7	20%
ESBL <i>E.coli</i>	28	80%
<i>E. coli</i> O157:H7 EHEC	8	23%
<b>Parasites</b>		
<i>Sarcocystis cruzi</i>	4	11%
<i>Sarcocystis tenella</i>	4	11%
<i>Toxoplasma gondii</i>	2	6%

### **Anti-microbial potential of raw Pet Foods**

van Bree (2018)<sup>5</sup> cites the identification of antibiotic-resistant bacteria, including extended-spectrum beta-lactamase (ESBL)-producing *E. coli* in raw pet foods (References 22-24 therein). One such study in Sweden investigated the presence of *Escherichia coli* with transferable resistance to extended spectrum cephalosporins (ESC) in raw pet food. *Escherichia coli* was isolated from all 39 commercial raw pet food samples (8 brands) and ESC-resistant *E. coli* was isolated from nine samples (23%). All ESC-resistant *E. coli* were PCR-positive for the *bla*<sub>CMY-2</sub> group and only one of them was also resistant to a non-beta-lactam antibiotic.<sup>18</sup>

Chengappa *et al* (1993)<sup>19</sup>, as cited by van Bree (2018)<sup>5</sup> details that of 112 samples of commercial raw meat used in racing greyhound diets, fifty culture samples (45%) tested positive for *Salmonella* (14x serovars), predominantly *S. typhimurium*<sup>20</sup>. Antimicrobial susceptibility testing revealed that most of the *Salmonella* isolates were sensitive to a variety of antimicrobials, particularly amikacin and apramycin, and fully resistant to others, such as clindamycin, erythromycin, penicillin, and sulfadimethoxine.

A Canadian PhD Thesis (2014)<sup>21</sup> and associated publication<sup>22</sup>, studied risk factors for the zoonotic potential of pet dogs including antimicrobial resistance (AMR) of *Salmonella* and *E. coli*. Statistically significant risk factors included contact with livestock, receiving a probiotic in the previous month, feeding a raw food diet or a homemade cooked diet, and having more than one dog in the household. Antimicrobial

<sup>18</sup> Nilsson O. (2015). Hygiene quality and presence of ESBL-producing *Escherichia coli* in raw food diets for dogs. *Infect Ecol Epidemiol* 2015;5:28758. <https://www.tandfonline.com/doi/full/10.3402/iee.v5.28758>

<sup>19</sup> Chengappa M. *et al* (1993). Prevalence of *Salmonella* in raw meat used in diets of racing greyhounds. *J Vet Diagn Invest* 5:372-377. <http://journals.sagepub.com/doi/pdf/10.1177/104063879300500312>

<sup>20</sup> The results for *Salmonella* positive samples was even higher using molecular probe technology at 70/106 samples.

<sup>21</sup> Leonard E. (2014). What Could Your Dog Be Carrying? – Zoonotic Enteric Bacteria in Pet Dogs in Ontario: Prevalence, Risk Factors, and Antimicrobial Resistance. Thesis University of Guelph, Canada. [https://atrium.lib.uoguelph.ca/xmlui/bitstream/handle/10214/8158/Leonard\\_Erin\\_201405\\_PhD.pdf?sequence=3&isAllowed=y](https://atrium.lib.uoguelph.ca/xmlui/bitstream/handle/10214/8158/Leonard_Erin_201405_PhD.pdf?sequence=3&isAllowed=y)

<sup>22</sup> Leonard E. (2012). Comparison of antimicrobial resistance patterns of *Salmonella* spp. and *Escherichia coli* recovered from pet dogs from volunteer households in Ontario (2005–06). *J Antimicrob Chemother* 2012; 67: 174–181.

susceptibility testing was performed on 515 *Salmonella* and *E. coli* isolates recovered from 136 dogs from 83 households. The majority of bacterial isolates (80%) were pan-susceptible and 11% were resistant to two or more antimicrobial classes. Mathematical modelling determined homemade (cooked or raw) diets and commercial raw diets as statistically significant risk factors for the pet's risk of *Salmonella* carriage and AMR profile, based on faecal sampling with many of the associations linked to feeding raw pet food. The prevalence of AMR in *Salmonella* and/or *E. coli* isolates was approximately 20% and the prevalence of dogs carrying an AMR isolate was approximately 28%. The most common *Salmonella* AMR pattern found in was resistance to amoxicillin/clavulanic acid, ampicillin, cefoxitin, ceftiofur and ceftriaxone, (AMC-AMP-FOX-TIO-CRO) and was only found in *S. Heidelberg*, potentially resulting from the presence of plasmids conferring  $\beta$ -Lactam resistance. Whilst the most common *E. coli* AMR found were resistance to ampicillin, followed by ampicillin and tetracycline (AMP-TET) resistance.

Previous published studies at the University of Liverpool which investigated antibiotic resistant bacteria in the faeces of dogs, demonstrated that the feeding of raw meat to dogs was a risk factor associated with the carriage of *E. coli* resistant to antibiotics which are important for treating infections in both humans and dogs (Schmidt *et al*, 2015, Wedley *et al*, 2017)<sup>23</sup>. More recently, Wedley *et al* (2017) investigated the prevalence and molecular characteristics of ESBL and plasmid encoded AmpC (pAmpC)-producing *E. coli* in the mainland UK vet-visiting canine population and identified factors associated with their carriage. Modelling of risk factors to multi-drug resistance (MDR to three or more antimicrobial classes), fluoroquinolone resistant, ESBL and AmpC-producing *E. coli* was determined. AMR *E. coli* were isolated from 44.8% (n=260) of samples, with 1.9% and 7.1% of samples carrying ESBL and pAmpC-producing *E. coli*, respectively and MDR *E. coli* were identified in 18.3% of samples. Recent use of antimicrobials and being fed raw poultry were both identified as risk factors in the outcomes investigated. A number of virulence and resistance genes were identified, including genes associated with extra-intestinal and enteropathogenic *E. coli* genotypes<sup>24</sup>. In more recent study; yet to be published, dogs fed diets containing raw-meat were more likely to carry *Salmonella* species and antibiotic resistant *E. coli* compared to the control group (cooked diets), including *E. coli* resistant to multiple types of antibiotics, including those critically important to human health, such as the 3<sup>rd</sup> generation cephalosporins (31% of dogs on raw diets compared to 4% of dogs on cooked meat diets).

### **Commonly identified risks of raw pet food on pets**

***Salmonella*:** Although not all pets display symptoms when infected; those who do, may have symptoms within 72 hours of infection which can include vomiting, diarrhoea (which may be bloody), fever, loss of appetite and/or decreased activity level. Once *Salmonella* becomes established in the pet's gastrointestinal tract, the animal can

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<sup>23</sup> Schmidt V. Do raw meat diets pose health risk for our pets and us? <https://www.liverpool.ac.uk/infection-and-global-health/research/pet-health/raw-pet-food/>

<sup>24</sup> Wedley A. (2017). Carriage of antimicrobial resistant Escherichia coli in dogs: Prevalence, associated risk factors and molecular characteristics. [Vet Microbiol. 2017 Feb;199:23-30.](#)

shed bacteria when it has a bowel movement, and the contamination will continue to spread. Long term carriage and shedding has been frequently reported; although van Bree notes that shedding of *salmonellae* is generally thought to last up to one week after feeding a contaminated raw pet food diet only once, shedding may last for up to eight months if animals are fed contaminated raw pet food over a longer period.<sup>5</sup>

**Listeria:** Listeriosis is not common in pets, but can lead to symptoms of nausea, diarrhoea, fever and even neurological disease in a minority of cases. However, although not all pets display symptoms when infected; those who do, may have symptoms within a matter of a few hours, but possibly weeks after infection. Pets do not need to display symptoms to be able to pass *Listeria monocytogenes* onto their human companions. Once established in the pet's gastrointestinal tract, the animal can shed the bacteria when it has a bowel movement, and the contamination will continue to spread<sup>28,25</sup>. In an historic case, van Bree *et al* (2018)<sup>5</sup> indicates that *Listeria monocytogenes* was attributed to the abortion of a dog fed on raw pet food.

**E. coli (inc. E.coli O128, O157):** Currently, there is no evidence that *E. coli* O128 causes illness in pets and rarely for *E. coli* O157, but pets can serve as carriers/shedders and pass to humans.<sup>5,26</sup>

**Campylobacter:** It is recognised that *Campylobacter* can be high in fresh raw poultry petfood<sup>5,21</sup>, however, it is not generally observed in frozen goods as *Campylobacter* is greatly reduced during the freeze/thaw process.<sup>5</sup>

**Parasites:** For many *Sarcocystis* species, dogs and other carnivores serve as the definitive host, compared to livestock which can serve as intermediate hosts. Although infection in dogs can lead to the development of tissue cysts, this does not pose a risk for other animals. In contrast, infection in cats can result in oocyst shedding, predominantly after primary infections.<sup>5</sup>

### **Other potential risks:**

Listed within the US FDA withdrawal/recall postings, other risks identified include:

- several incidents of animal injury from bone shards present in the raw petfood<sup>26</sup>
- elevated levels of thyroid hormones with three reports of pet illness.<sup>27</sup>

van Bree *et al* (2018)<sup>5</sup> also cites cases of development of clinical conditions in pets attributed to raw pet food diets, including hyperthyroidism, and injuries such as gastrointestinal tract perforation or teeth fractures. More generally, van Bree also highlights nutritional deficiencies in pets fed on raw pet food diets.

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<sup>25</sup> FDA's Advice: Know the Risks of Feeding Raw Foods to Your Pets.  
<https://www.fda.gov/forconsumers/consumerupdates/ucm403350.htm>

<sup>26</sup> US FDA (2018). Updated: FDA Investigates Pattern of Contamination in Certain Raw Pet Foods Made by Arrow Reliance Inc., Including Darwin's Natural Pet Products and ZooLogics Pet Food. (26 03 18).  
<https://www.fda.gov/animalveterinary/newsevents/ucm596555.htm>

<sup>27</sup> US FDA (22 03 18) Limited Production of Two Varieties of Milo's Kitchen® Dog Treats Voluntarily Recalled Due to Potentially Elevated Levels of Thyroid Hormone <https://www.fda.gov/Safety/Recalls/ucm602469.htm>

## **Incidents of morbidity or mortality in pets associated with raw pet food**

The US FDA publishes details of withdrawals and recalls of pet foods including raw and dog treats, examples of animal and human illness in 2018 is presented below:<sup>28</sup>

- Within the latest US FDA recall in March 2018, the investigation was triggered by a dog that had recurring diarrhoea over a nine-month period attributed to *Salmonella*, where the raw pet food also tested positive.<sup>26</sup>
- The US FDA recently updated on this recall above, as being part of a wider pattern of microbiological failures in raw pet food from a single company; following five recalls from the online retailer between October 2016 to March 2018. Collectively, the failures included identification of STEC O128 and *Salmonella* and/or *Listeria monocytogenes*. Within this recall the FDA has investigated six complaints of illness and/or death in animals. Of the complaints, one concerned the death of a kitten suffering from a severe systemic *Salmonella* infection. Whole genome sequencing (WGS) was indistinguishable from that isolated from the kitten and the same batch of raw pet food which the kitten had consumed.<sup>26</sup>
- In a separate incident in the USA (1 March 2018), a recall was initiated by the death of two kittens, one which was confirmed to be caused by *Salmonella* septicaemia. Subsequent testing of the raw pet food revealed the presence of *Salmonella* and *Listeria monocytogenes*.<sup>29</sup>
- [For reference only, as outside scope for raw pet food]. Also in 2018, *Listeria monocytogenes* was identified in green beans within a lightly cooked frozen pet food which was associated with short-term symptoms of diarrhoea and vomiting in some dogs, although listeriosis was not diagnosed.<sup>30</sup>

In an historic case in the USA (published 2001), association between fatalities in cats and raw pet food was determined. *Salmonella* gastroenteritis and septicaemia were diagnosed in two cats presented for necropsy. Both cats resided in the same household and were fed a home-prepared, raw meat-based diet. *Salmonella* was isolated from multiple organs in both cats and from samples of raw beef incorporated into the diet fed to one of the cats. Subtyping of the bacterial isolates yielded *Salmonella* Newport from one cat and from the diet it had been fed.<sup>31</sup>

In another historic publication (1993)<sup>19</sup> reference is made to high morbidity and mortality rates (approaching 100% and 40% respectively) from salmonellosis in greyhound puppies reared in racing kennels in the USA.

In 2017, an infection of *Brucella suis* in a dog was identified in the Netherlands, which ultimately led to the euthanasia of the pet due to poor health. The same strain (biovar

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<sup>28</sup> US FDA Recalls & Withdrawals. <https://www.fda.gov/animalveterinary/safetyhealth/recallswithdrawals/default.htm>

<sup>29</sup> US FDA Recalls & Withdrawals. Blue Ridge Beef Recalls Kitten Grind Raw Pet Food Lot#GA1102 Because of Possible Contamination. <https://www.fda.gov/Safety/Recalls/ucm599261.htm>

<sup>30</sup> US FDA (19 January 2018). JustFoodForDogs Voluntarily Recalls Three Daily Diets because of Possible *Listeria monocytogenes* Health Risk from Green Beans. <https://www.fda.gov/Safety/Recalls/ucm593097.htm>

<sup>31</sup> Stiver s. *et al* (2001). Septicemic Salmonellosis in Two Cats Fed a Raw-Meat Diet. *Journal of the American Animal Hospital Association*: November/December 2003, Vol. 39, No. 6, pp. 538-542. <https://doi.org/10.5326/0390538>

1) was positively identified in a raw pet food (hare carcasses imported from Argentina), albeit a different batch tested to which the dog had previously consumed.<sup>32,33</sup>

In 2014 it was reported that the disease Alabama Rot in dogs could be associated with raw pet food diets in the UK. Given the geographic spread and potential association with contaminated waters (and fish), this hypothesis has not been substantiated.<sup>34</sup>

### **Risks of Raw Pet Food on Humans**

van Bree *et al* (2018)<sup>5</sup> provides an outline (and references therein) on human transmission routes; either through direct contact with the pet food; or indirectly with a contaminated pet, such as sharing the same bed, licking of the face and hands; through contact with household surfaces; or by ingesting cross-contaminated human food. Cross-contamination may also occur after preparing raw pet food or cleaning infected food bowls in kitchen environments.

*Salmonella* and *Listeria* can cause severe and potentially fatal infection in both the animals consuming the pet food, and the humans that handle the pet food. There is a risk to humans from handling contaminated pet products, especially if they have not thoroughly washed their hands after having contact with the products or any surface exposed to these products. Pets can be carriers of the bacteria and infect humans, even if the pets do not appear to be ill. Once *Salmonella* and/or *Listeria monocytogenes* becomes established in the pet's gastrointestinal tract, the animal can shed the bacteria when it has a bowel movement, and the contamination will continue to spread<sup>35</sup>. Van Bree *et al* (2018)<sup>5</sup> cites numerous references on the prevalence of *Salmonella* in raw pet foods, ranging from 5-80%.

Similarly, pets can get sick from *E. coli* O128 and can also become carriers and infect humans, even in the absence of apparent illness of the pet.<sup>26</sup>

Whilst dogs can act as definitive hosts for parasites; the same may be true for humans, also becoming infected with species of *Sarcocystis*, although this seldom leads to clinical disease.<sup>5</sup>

### **Incidents of morbidity in humans associated with Raw Pet Food**

In February 2018, the US FDA reported a case of two children in a single household in the USA becoming ill with *Salmonella* Reading; the same serovar was identified in

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<sup>32</sup> van Dijk MAM, Engelsma MY, Visser VXN, Spierenburg MAH, Holtslag ME, Willemsen PTJ, et al. *Brucella suis* infection in dog fed raw meat, the Netherlands, 2016. *Emerg Infect Dis*. 2018 Jun. <https://doi.org/10.3201/eid2406.171887>

<sup>33</sup> Frost, A. (2017) Feeding of raw *Brucella suis*-infected meat to dogs in the UK. *Veterinary Record* **181**, 484. <http://dx.doi.org/10.1136/vr.j4972>

<sup>34</sup> The Daily Telegraph (2014). Raw meat could be cause of dead dogs, scientist warns. <https://www.telegraph.co.uk/news/health/pets-health/10731896/Raw-meat-could-be-cause-of-dead-dogs-scientist-warns.html>

<sup>35</sup> US FDA: Blue Ridge Beef Voluntarily Recalls BRB Complete Raw Pet Food. <https://www.fda.gov/Safety/Recalls/ucm602723.htm>



the raw pet food fed to their dog. One child's illness resulted in septicaemia (blood infection) and osteomyelitis, a painful and serious bone infection.<sup>36</sup>

### **Risk recommendations**

US FDA advice and Nemser *et al* (2014)<sup>15</sup> recognise that raw pet food; and to a lesser extent, jerky treats can pose a microbiological risk to both pets and humans. The US FDA does provide specific consumer advice on raw pet food as summarised in Annex I. The US Centers for Disease Control and Prevention (CDC) does not recommend feeding raw diets to pets.<sup>37</sup>

The Canadian Veterinary Medical Association (CVMA) published a position statement in 2012, outlining that documented scientific evidence of potential animal and public health risks in feeding raw meats outweigh any perceived benefits of this feeding practice, although has not gone as far as pressing against its use.<sup>38</sup>

In the UK, the Pet Food Manufacturers Association (PFMA) has published a consumer advice factsheet specifically on feeding raw pet food. Whilst there is reference to avoiding cross-contamination, there is no further information on microbiological risks<sup>39</sup>. In addition, the PFMA has published new sector guidelines for the manufacture of commercial raw pet food.<sup>40</sup>

The UK national charity, Pets as Therapy (PAT) issued a statement in early 2018 urging volunteers not to feed raw meat-based diets to their therapy dogs; which often attend hospital/clinical and school environments, due to the potential of spreading disease especially to vulnerable groups. This statement is presented in Annex II (although the PAT website has been offline over recent weeks).

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<sup>36</sup> US FDA (8 February 2018). Raws For Paws Recalls Turkey Pet Food Because of Possible *Salmonella* Health Risk. <https://www.fda.gov/AnimalVeterinary/NewsEvents/ucm596071.htm>

<sup>37</sup> Pet Food Safety. <https://www.cdc.gov/features/pet-food-safety/index.html>

<sup>38</sup> Canadian Veterinary Medical Association and public health agency of Canada joint position statement - Raw food diets for pets. <https://www.canadianveterinarians.net/documents/raw-food-diets-for-pets>

<sup>39</sup> Responsible Raw Feeding for Cats and Dogs. <https://www.pfma.org.uk/assets/docs/fact-sheet/PFMA-fact-sheet-raw-feeding.pdf>

<sup>40</sup> PFMA (2017) Guidelines for the Manufacture of Raw Pet Food in the UK. <https://www.pfma.org.uk/assets/docs/raw/Raw-Pet-Food-Guidelines-Oct-17.pdf>

## Annex I: US FDA Advice: Avoid the Dangers of Raw Pet Food

FDA thinks that raw pet food poses significant health risks to pets and pet owners. Because raw pet food is more likely than other types of pet food to contain *Salmonella* and *Listeria monocytogenes*, the single best thing you can do to prevent infection with these foodborne bacteria is to not feed your pet a raw diet. However, we understand that some people prefer to feed raw pet food diets to their pets. If you choose to feed raw pet food, you should be aware of the risks.

### Tips to Prevent Infection

- If you choose to feed raw pet food to your pet, here are some tips to prevent infection:
  - Thoroughly wash your hands with soap and water (for at least 20 seconds) after handling raw pet food, and after touching surfaces or objects that have come in contact with the raw food.
  - Thoroughly clean and disinfect all surfaces and objects that come in contact with raw pet food. First wash with hot soapy water and then follow with a disinfectant. You can also run items through the dishwasher after each use to clean and disinfect them.
  - Freeze raw meat and poultry products until you are ready to use them, and thaw them in your refrigerator or microwave, not on your countertop or in your sink.
  - Carefully handle raw and frozen meat and poultry products. Don't rinse raw meat, poultry, fish, and seafood. Bacteria in the raw juices can splash and spread to other food and surfaces.
  - Keep raw food separate from other food.
  - Immediately cover and refrigerate what your pet doesn't eat, or throw the leftovers out safely.
  - If you're using raw ingredients to make your own cooked pet food, be sure to cook all food to a proper internal temperature as measured by a food thermometer. Thorough cooking kills *Salmonella*, *L. monocytogenes*, and other harmful foodborne bacteria.
  - Don't kiss your pet around its mouth, and don't let your pet lick your face. This is especially important after your pet has just finished eating raw food.
  - Thoroughly wash your hands after touching or being licked by your pet. If your pet gives you a "kiss," be sure to also wash your face.
- No matter what type of pet food you feed your pet, you should always follow these [safe handling instructions](#).

## **Annex 2: Pets As Therapy – Raw Pet food Statement.**

Pets As Therapy (PAT) is a national charity which provides therapeutic visits to hospitals, hospices, nursing and care homes, special needs schools and a variety of other venues by volunteers with their own dogs and cats.

PAT has recently considered the potential risks posed when feeding Raw Meat Based Diets. Raw meat can contain not only parasites, but also the bacteria causing such serious infectious diseases as *E-Coli*, *Salmonella* and *Listeria* which can be extremely dangerous to humans. These bacteria are NOT killed by freezing the meat.

In the light of recent scientific and medical advice from a number of veterinary consultants we are updating our guidelines with the aim of minimising any health risks associated with PAT pet visits to the young, the elderly and the immuno-comprised recipients of our service.

An increasing number of NHS Trusts and education authorities now state in their Infection Prevention and Control Policies that they cannot accept visits from therapy dogs fed on raw meat and in order to ensure that PAT dogs are considered safe to visit schools and hospitals in future, it is our duty of care to comply.

Therefore, PAT pets should NOT be fed raw meat – or unpasteurised milk. This will reduce the potential risk of diseases such as *E-coli*, *Salmonella* and *Listeria* being transmitted to humans from our pets.

Safeguarding our clients is our key responsibility, so your understanding and co-operation in this matter is much appreciated.”