

Veterinary Research: My Experiences

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Plan

- Me and my research journey
- Overview of my PhD itself and key findings- hopefully inspire you!
- Opportunities my PhD gave me
- Research beyond my PhD
- Advice



About Me

- First opinion small animal vet
- BSc Zoology (Liverpool, graduated 2008)
- BVetMed (RVC, graduated 2012)
- CertAVP (module in evidence based veterinary medicine- more later)
- Worked within 2 universities as a vet:
 - UVP (Liverpool) 2016-2018
 - Feline shelter vet (RVC) 2018-2019
- PhD (Liverpool) 2019-2022
- Lecturer- teaching and research (Liverpool) 2022-



Why did I want to do a PhD?

- Answer a question I had encountered in clinical practice
- Provide more evidence towards a scant evidence base
- Informed choice for owners
- Genuine interest in topic area!



Where do I find a PhD?

- Findaphd.com
- Vet record careers (clinical based PhDs e.g. Edinburgh University)
- University website
- Contact potential supervisors directly
- Previous student research projects/Masters
- Social media (Facebook, Twitter, etc)
- Relevant societies/charities



What did I do?

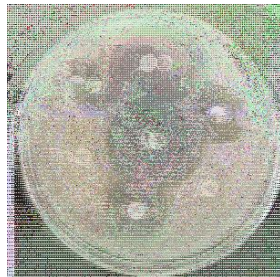
- Set myself clear criteria
 - ‘Clinically relevant’
 - Area of interest- medicine, AMR
 - Companion species
 - Clear impact ‘on the ground’
- Looked online (findaphd.com)
- Contacted prospective supervisors (Prof Gina Pinchbeck, coordinated evidence-based veterinary medicine module, CertAVP)
 - Put me in contact with Prof Nicola Williams
- Came to visit!



PhDs: The 'good' and the 'challenging' for me...

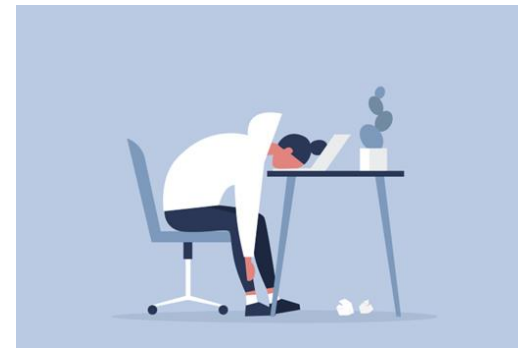
Good

- Learning new skills
- Meeting new people
- Deeper understanding about subject
- Getting my own results!
- Presenting at conferences online and in person
- Interaction with lots of different stakeholders!
- Greater flexibility



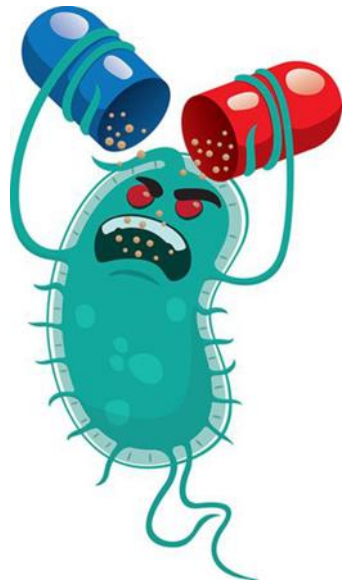
Challenging

- Time management!
- Different working environment
- Often sole person working on topic
- Learning new skills!
- Emotive subject, real dog owners



My PhD:

‘Antimicrobial Resistance and the Public Health Impact of Feeding Raw Meat Diets to Dogs’

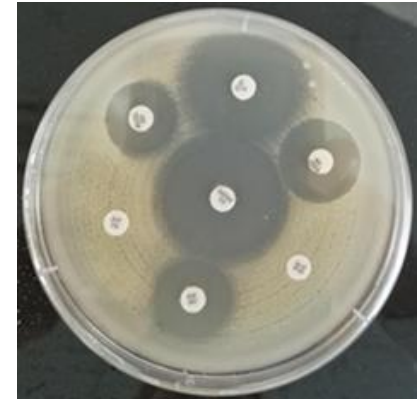
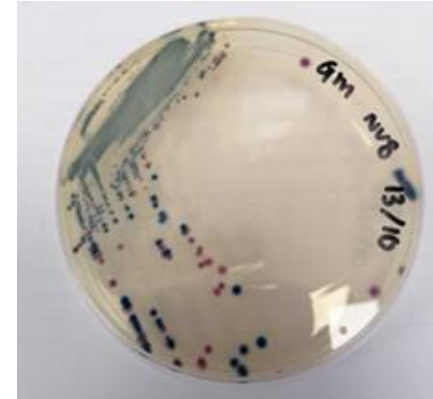


My PhD: Overview of studies

- 4 main projects in my PhD
- ‘Dogs Dinner Survey’- online survey of dog owner pet food choices, reasons and beliefs around pet food choice
- Study of microbiological contamination of dog foods (raw and dry kibble)
- Cross-sectional study to determine carriage of AMR- *E. coli* by dogs fed raw or non-raw diets
- Longitudinal study of carriage of AMR- *E. coli* by dogs, co-carriage by people and contamination of food/water bowls

My PhD: Skills acquired

- Epidemiological:
 - Data handling and analysis
 - Multivariable modelling
 - Stats programs
- Laboratory:
 - Microbiological methods- bacterial culture/sensitivity, antimicrobial susceptibility testing
 - Molecular methods- PCR, DNA extraction for whole genome sequencing
- Personal:
 - Time management
 - Communication skills
 - Presentation skills



Study 1: Survey Responses

	N	Diet choice N		Diet choice proportion (95% CI)	
		Raw	Non Raw	Raw	Non Raw
Owners responded	1832	915	916	0.50 (0.48,0.52)	0.50 (0.48,0.52)
Dogs discussed	3212	1754	1458	0.55 (0.53,0.56)	0.45 (0.44,0.47)
Total breeds represented	156				

- Recruited via **social media, word of mouth, visit to Crufts**
- **1832** dog owners completed the survey
- **3212** dogs had diet information provided
- Approximately **50%** raw fed



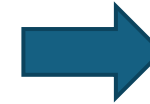
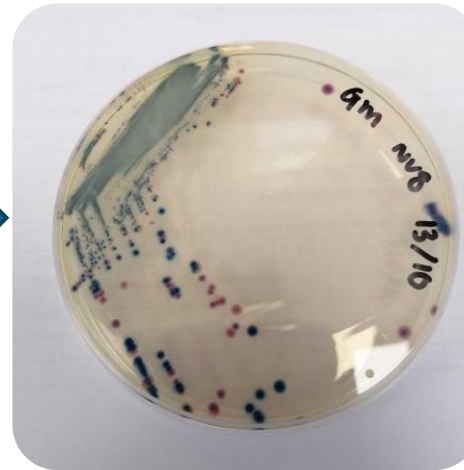
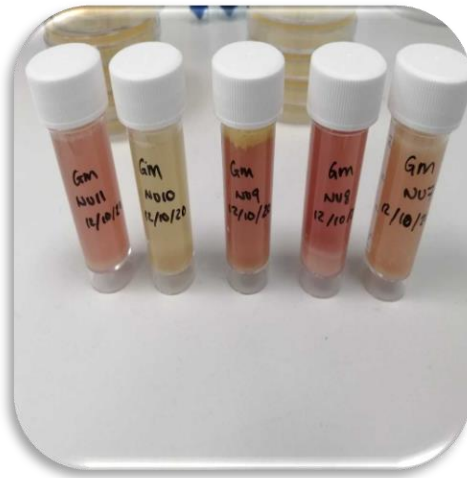
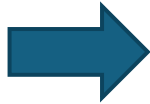
Key findings

- Owners who fed a **raw** diet were more likely to cite **coat quality, behavioural reasons, a lack of trust** of certain foods and a **more natural choice** as reasons for their diet choice
- Owners who fed a **non-raw** diet were more likely to cite **advice from a vet professional, cost** and **safety concerns** as reasons for their diet choice
- Owners who fed a **raw** diet were more likely to cite **dog breeder, friend/family** and **pet food group on social media** as information source (compared to consulting a veterinary professional e.g. VS or VN)
- Owners who fed a **raw** diet were significantly more likely to **perceive no risk** of feeding a raw diet to their **dog, themselves, or in-contact dogs or people**

Microbiological methods

✦ **Top 10 brands** of frozen, pre-prepared raw meat diets and kibble

- **110** raw samples (9-15 samples of each brand)
- **23** kibble samples (1-3 samples of each brand)



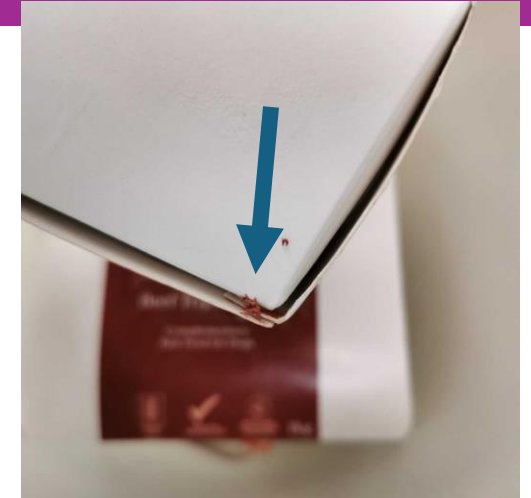
Study 2: Food study results

- ✦ **Top 10 brands** of frozen, pre-prepared raw meat diets and kibble (**110 raw samples, 23 kibble samples**)
- ✦ **99%** (109/110) of raw meat samples grew ***E. coli***
- ✦ **39%** (43/110) of raw meat samples had **antimicrobial-resistant *E. coli*** present
- ✦ **16%** (18/110) of raw meat samples had *E. coli* resistant to **3rd-generation cephalosporins** (HPCIA) present
- ✦ **10%** (11/110) of raw meat samples had **multidrug resistant*** *E. coli* present
- ✦ **No kibble samples grew any *E. coli***



*Resistance to 3 or more classes of antibiotics

Raw food packaging



Leaked contents



Study 3: Dog faecal AMR- E. coli carriage

- Participants recruited via **previous participation** in studies, **social media** and **word of mouth**
- Laboratory methods as per raw food study
- Accompanying questionnaire discussing **diet choice** (and other risk factors)

- **432** samples received

Type of diet fed	% (N)
RMD	44.7 (193)
NRMD	55.3 (239)

Study 3: Key results

Phenotypic resistance	Diet choice % (N)		p value
	<i>RMD</i>	<i>NRMD</i>	
	44.7 (193)	55.3 (239)	
<i>E. coli</i> resistant to ≥ 1 class of antibiotics	39.4 (76)	13.8 (33)	<0.001
MDR ESBL- producing <i>E. coli</i>	16.6 (32)	1.3 (3)	<0.001
Fluoroquinolone-resistant ESBL-producing <i>E. coli</i>	10.9 (21)	0.8 (2)	<0.001
Third-generation cephalosporin resistant (3GCR) <i>E. coli</i>	32.6 (63)	5.0 (12)	<0.001
Total samples in study: 432			

MDR: Multidrug resistant

RMD: Raw diet; NRMD: Non-raw diet

Common Risk Factors



Antibiotics



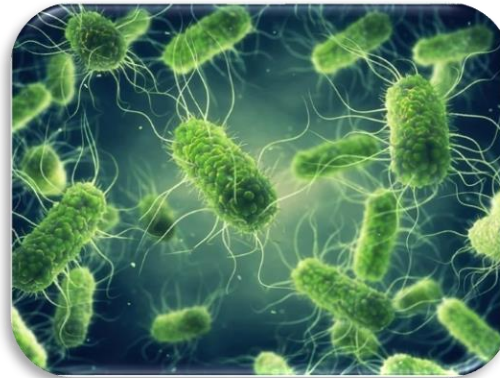
**Veterinary
visit**



Raw Diet

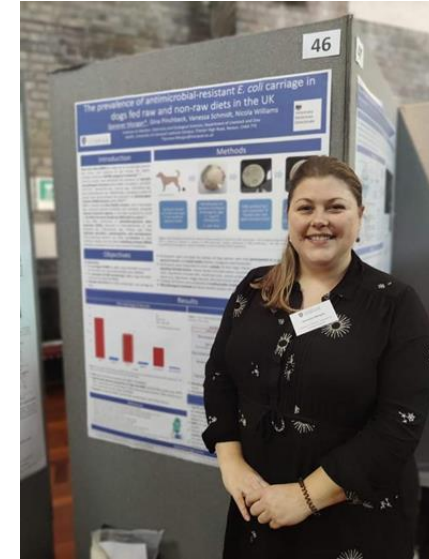
Salmonella spp. in dried meat treats!

- **Dried meat treats** (uncooked/non-processed) n=84
- ***Salmonella enterica*** identified in **15.5%** (n=13) via bacterial culture and WGS
→ Isolated from pizzle sticks, bison ears, furry rabbit ears, chicken treats
- Treat types associated with **specific** *S. enterica* serotypes
- **5 serotypes identified:**
 - *S. Anatum*
 - *S. Derby*
 - *S. Infantis*
 - *S. Typhimurium*
 - *S. Dublin*
- **All serotypes known to cause human infection**



Opportunities during my PhD

- Presenting at conferences in UK and abroad
- Presenting my work to influential stakeholders
 - Government bodies (VMD, DEFRA, FSA, UKHSA)
 - Veterinary stakeholders (BVA, BSAVA)
 - Dog-related associations (Dogs Trust, APBC)
- Supervising undergraduate student projects
- Publishing my own work!



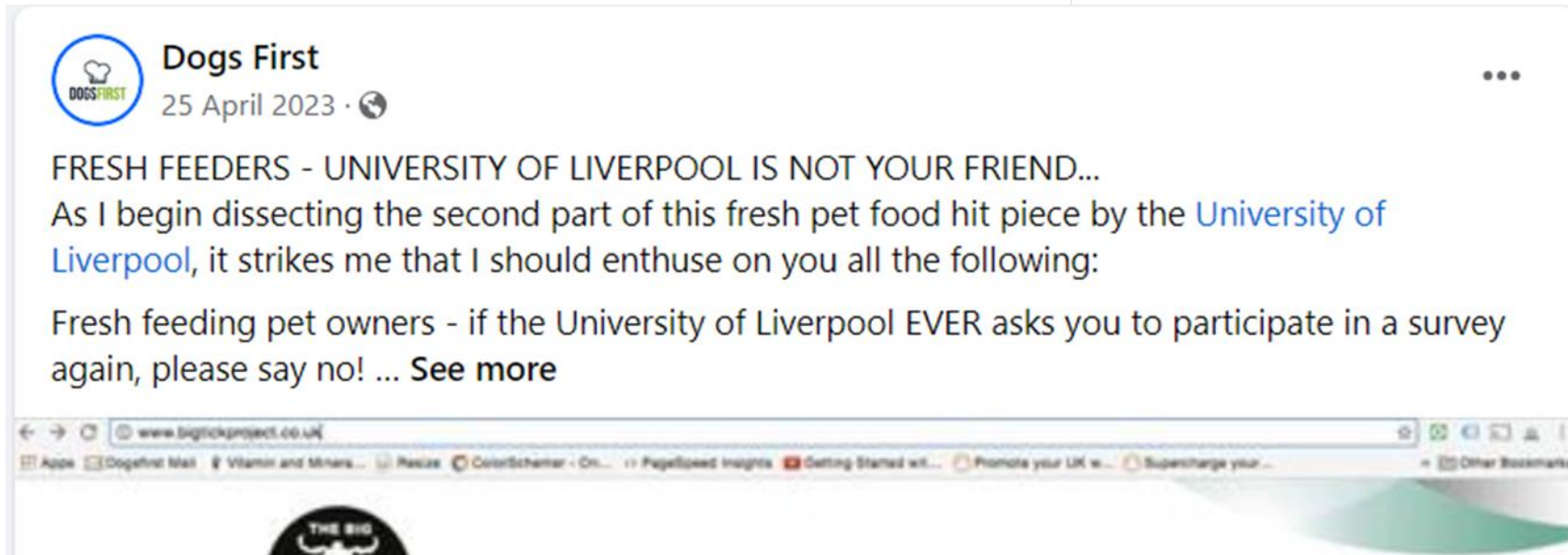
My PhD: Opportunities for real-world impact

- This was always important for me...
- PhD ‘ticked that box’
- Work included in VMD/UKHSA UK One Health Report
- Contributed to BVA working group for companion animal feeding
- Contributed to DEFRA Antimicrobial Resistance Coordination group
- Formed basis for larger FSA investigation into raw pet foods



Research beyond my PhD...

- Qualitative project with Dr Tamzi



Dogs First
25 April 2023 · 🌐

FRESH FEEDERS - UNIVERSITY OF LIVERPOOL IS NOT YOUR FRIEND...

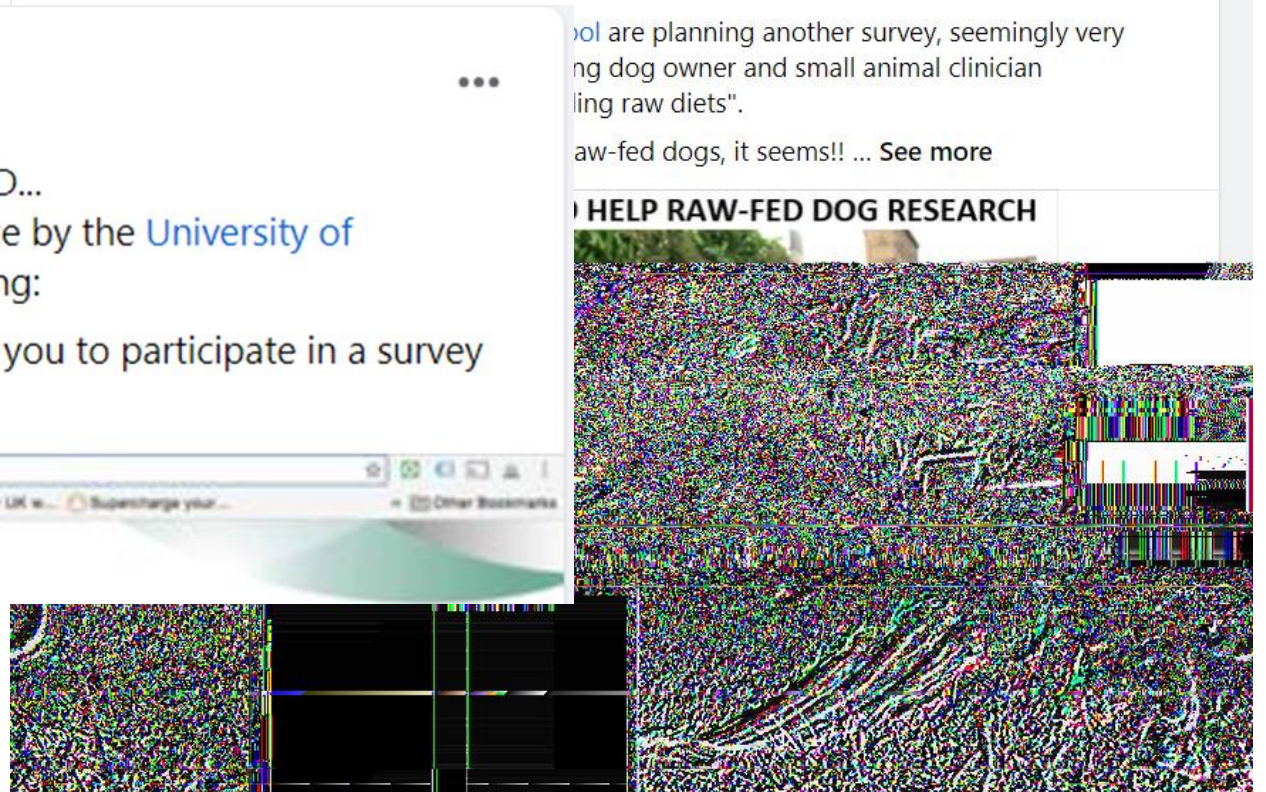
As I begin dissecting the second part of this fresh pet food hit piece by the [University of Liverpool](#), it strikes me that I should enthuse on you all the following:

Fresh feeding pet owners - if the University of Liverpool EVER asks you to participate in a survey again, please say no! ... [See more](#)

www.bigtickproject.co.uk

Apps | Dogefirst Mail | Vitamin and Minerals... | Resize | ColorSchemer | On... | PageSpeed Insights | Getting Started with... | Promote your UK w... | Supercharge your... | Other Bookmarks

THE BIG

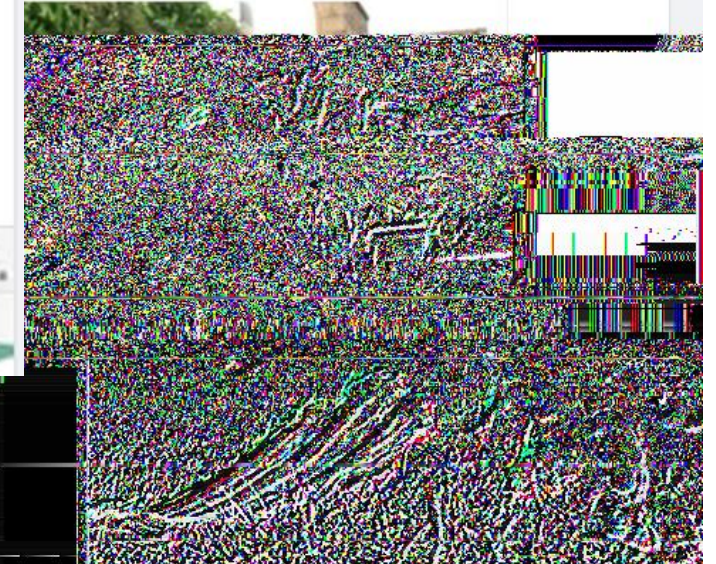


Dogs First
11 May 2023 · 🌐

WARNING RAW FEEDERS, THE UNIVERSITY OF LIVERPOOL ARE AT IT AGAIN ... AND HELP NEEDED WITH SOME ACTUAL MEANINGFUL WORK...

ool are planning another survey, seemingly very ng dog owner and small animal clinician ling raw diets\". aw-fed dogs, it seems!! ... [See more](#)

HELP RAW-FED DOG RESEARCH



- Pushback from certain groups

Focus group findings

Vet concerns

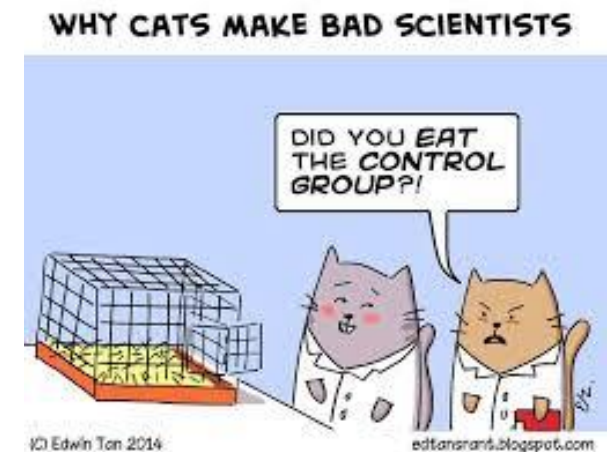
- Nutritional formulation
- Lack of regulation of ingredients
- Bacterial load/AMR (esp. with immunocompromised dogs/people)
- Injuries/physical harm to the dog eating it (e.g. bones stuck in teeth, foreign bodies)
- Mistrust of poor owner food management/hygiene
- Mistrust of raw marketing
- Perceived poor ability to communicate due to polarisation/discord of opinions

Owner concerns

- Nutritional formation of non-raw products (believe have more control over raw ingredients)
- Lack of trust/regulation of non-raw food companies
- Avoidable disease (raw= disease prevention attributes, non-raw= unhealthy)
- Mistrust of vets as an information source
- Trust their own abilities in bacterial control and risk mitigation
- Invested in exploring alternative approaches to dog's care

Research beyond my PhD...

- AMR in companion animals- my ongoing area of interest
 - Cats 😊
- ESKAPE pathogens
 - Bacteria which are of serious concern due to AMR carriage
 - Found in raw food samples but not specifically tested for
 - More structured study, WGS
 - Potentially overlooked



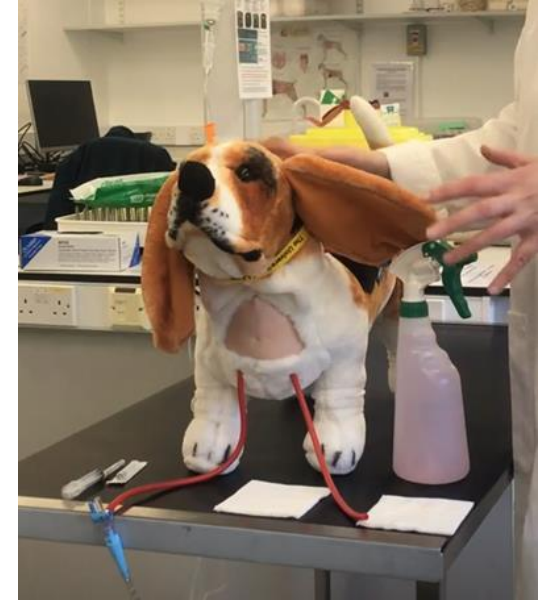
Would I do it again?

- Yes!
- Good days and bad days
- Exciting to have own results and contribute to evidence base and society
- Opened many doors



My new role


- Opportunity available because of my PhD
- Lecturer in Small Animal Clinical Skills
- Teaching and research track (50:50)
- Taught component: lectures, practical classes, surgical skills
- Research component: my own ideas!
- Clinical component: Cats Protection



My advice...

- DO have a clear idea of what you might be interested in
- DO be open to going outside of your comfort zone
- DO contact prospective supervisors
- DO contact peers/colleagues to chat about their experiences
- DO have a clear idea of why you want to undertake the research/project/PhD
- DON'T hold back- believe in yourself and go for it!





Thanks for
listening!

Any questions?