



Professor Tom Humphrey

From butcher's boy... to boffin

Bristol University's Vet School (known as 'Langford') is one of only four schools in the country to share a prestigious grant worth £21.5million. *Tom Humphrey*, Professor of Food Safety, told Cherry Lewis how he got where he is today, and what the grant is for.



“I suppose you could say that I lacked motivation at school. I did disastrously in my O-levels, so I had to repeat the year. But because I was then a year behind all my friends, I was even more demotivated and decided to leave when the second round of exams had finished. I had been working as a butcher's boy on Saturdays and in the holidays for a few years, starting on a bike with a big basket on the front and graduating to assisting in cutting up meat and making the sausages. It was something that I really enjoyed so I decided the best course of

action was to learn to be a butcher. I consequently went to the College for the Distributive Trades in London to study meat technology. The courses

He stuck a knife under my chin

were designed for brain-dead butchers' boys like me, so I fitted in really well. And I liked it. I won both the silver and gold medals for meat technology, and for a few glorious

weeks I was the best butcher in the UK. So there I was thinking I was going to become rich by being a butcher, not realising that to do that you had to have your own shop.

I was a very young 19, now living on my own in a bedsit in London – God, it was dreadful – but I got a job as a quality control inspector at a Walls' factory, where they killed thousands of pigs a week. I was in charge of several floors, one with 400 men who had to cut up these pigs into lumps of meat for making sausages. Part of my job was to make sure that they didn't leave too much meat on the bones. One day I approached an Italian and suggested that he had left a picogramme too much on the bone. He turned round and stuck a knife under my chin. At that point I thought 'Tom, it's time to move on'. Anyway, by that time I hated it – and I was very bad at it. I used to hide in the toilet and eat pork pies.

So I decided a career change was necessary. A vacancy came up at a veterinary research centre in Essex, owned by the Animal Health Trust. I worked there for two years as a technician for Dr William Smith, FRS. He was doing all the microbiology to support the Swann Committee, which eventually called for a ban on the use of certain antibiotics in animal feeds, as they were leading to antibiotic resistance in animals. The work was wonderful. Dr Smith allowed me to use sophisticated techniques and gave me all my enthusiasm to get where I am now. At the same time I did a HND which gave me the education bug, so I went on to do a degree at Hatfield Poly, a PhD at the University of East →

→ Anglia (UEA) in Norwich, and then a post-doc there. After that I spent four years lecturing in a college in Devon, followed by 20 years in Public Health Laboratory Science, where I ended up heading my own research group.

I had been collaborating with people at Langford for a long time and had always thought that Langford was my spiritual home. I was particularly interested in their whole food chain approach to research, so when the job came up I went for it. I brought my research group with me and some of them are still funded by my previous employers. My group now comprises 14 people and they research almost exclusively into salmonella and campylobacter – the two main diseases caught from animals. In the UK it is estimated that there are 500,000 cases of campylobacter a year. Eighty two percent of food poisoning cases admitted to hospital are caused by campylobacter, and

there are probably 100 deaths. These bacteria are major pathogens and our thesis is that if you want to control them better, you have to understand what they are doing in the food chain. To do that you have to research how they respond to different conditions, what effect that has on their ability to survive food processing, and how that results in their ability to cause infection.

So the major focus of my group is on the organism – how, for example, salmonella and campylobacter respond to cold. Chilling is the major

explaining it at the molecular level. So when we change the environment, we are able to say which genes are switched on and off.

We are also looking at transmission routes – most people believe you get salmonella from eating something that has been contaminated by animal faeces, but on the farm itself there may be another, more important, route. Animals can acquire salmonella by breathing it in and the studies we have done with chickens have shown that you can achieve the same pathology in the animal with only 100 cells in the

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control factor that we have for fresh produce and it has long been believed that commonly used storage temperatures will stop the salmonella multiplying. In fact, it doesn't stop them multiplying, it only stops them dividing. The result is that you can end up with hundreds of cells in your fridge in the form of one very long filament. But when you warm them up the division process is suddenly completed and what was apparently one cell suddenly becomes many hundreds.

Take another situation – if you make mayonnaise with lemon juice and olive oil you create a mildly acidic environment. Any salmonella in there would respond by manufacturing a protective protein that would allow them to survive the acid stress. This explains why mayonnaise is such a good vehicle for food poisoning – any salmonella cells in mayonnaise have an enhanced ability to survive in your stomach because they are already more acid-tolerant than those in other environments. In addition, we are not only observing behaviour, we are

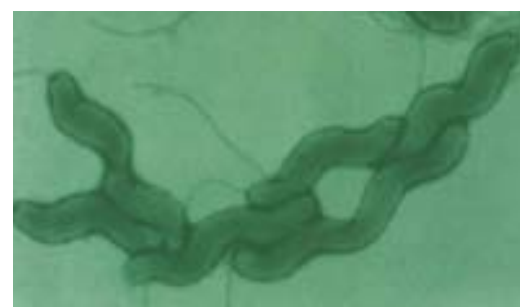
air, compared with 100 million cells taken orally. This may have vaccination potential – we know that injected dead cells produce a good antibody response, we know that airborne live cells also produce a good antibody response, so we are now going to explore what effect spraying animals with dead cells will have.

So this grant will allow us to reduce the amount of disease animals contract and transmit, and in addition it will help us develop better welfare conditions. It also confirms the importance of the University of Bristol as a centre for the study of the infectious diseases of farm animals. As you can imagine, we are very excited about it. ”

The butcher's boy has come a long way. ■

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The grant was awarded by Defra and the Higher Education Funding Councils, and Bristol's share is £3.6 million. The research will be led by Professor Tom Humphrey and Dr Mick Bailey.



Campylobacter jejuni



Christine Nichol

