



Misdirected science

Communication across the revolutionary divide is inevitably partial.

THOMAS KUHN¹

You may be wondering at the incongruity that science can put a man on the moon but cannot resolve the question of how to feed pets. Is it science itself or the usage made of science that creates the problem? My short answer would be that science is often lopsided and performed badly. For veterinary science matters are made worse by the ties, both subtle and not so subtle, that bind it to the artificial pet food industry.

Others have voiced criticism. J E Lovelock FRS, author of the Gaia Hypothesis, says: ‘Science has taken over from religion and it has become a rather corrupt church. It’s in its mediaeval theological phase.’² At a rather different level veterinarian Dr Jon Lumley suggested: ‘You do not need a postgraduate degree in nutrition to evaluate the effects of raw bones on a dog’s dentition — in fact, it appears that the qualification would be a serious disadvantage!’³ If some science is fundamentally flawed then in part this may be due to uncertainties surrounding scientific methodology. Nobel prizewinner Sir Peter Medawar commented:

Ask a scientist what he conceives the scientific method to be and he will adopt an expression that is at once solemn and shifty-eyed, solemn because he feels he ought to declare an opinion, shifty-eyed because he is wondering how to conceal the fact that he has no opinion to declare. If taunted he would probably

mumble something about ‘induction’ and ‘establishing the laws of nature’, but if anyone working in a laboratory professed to be

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trying to establish the laws of nature by induction we should begin to think he was overdue for leave.⁴

And this statement points up yet another problem. Scientists themselves will need to bring about changes. But if they remain uncertain

of their methods and objectives they remain hampered in their ability to evaluate and improve their performance. Philosophers of science have had more success analysing scientific method. Thomas Kuhn, author of *The Structure of Scientific Revolutions*, showed that:

Science is not the steady, cumulative acquisition of knowledge that is portrayed in the textbooks. Rather, it is a series of peaceful interludes punctuated by intellectually violent revolutions ... in each of which one conceptual world view is replaced by another...⁵

During peaceful interludes scientists perform tasks within a framework which Kuhn described as a paradigm; which taken literally means pattern. However he had in mind a more elaborate meaning, encompassing specific achievements of a given science and the problems and range of solutions available to that scientific discipline.⁶ Those inducted into the discipline come to accept and defend the world view held by the discipline despite the arbitrariness of personal and historical accidents which inform that view.

At the inception of a new paradigm new findings fit relatively easily into the framework but, as the paradigm reaches the limits of its potential, difficulties arise. Scientists at first tend to ignore inconsistencies and continue in dogged support of their world view. Alternatively they declare that information at variance with their paradigm belongs in another field of study.

In a curious way a paradigm’s flaws enable scientists to make

progress through increased ingenuity and determination — they try harder. Eventually, however, trying harder is not enough. Unexplained inconsistencies come to overwhelm the paradigm and it has to give way to a replacement. At this difficult time, equating to a revolution, the new paradigm provides for a reinterpretation of existing ‘facts’ plus additional explanatory powers. New paradigms come with new language and new uses for existing language such that many incoherent battles ensue. In veterinary science three dominant paradigms guide research and practice and each is under threat.

Germ theory paradigm

The evolution of the germ theory of disease provides an example of the pattern of events typical of a scientific paradigm. There can be no doubting that this theory, developed in the last years of the 19th century, has been of immense benefit to us all. In the beginning Frenchman Louis Pasteur and German physician Robert Koch encountered opposition to their opinion that microbes were responsible for the epidemic and contagious diseases of their time. By means of technically simple but intellectually brilliant experiments they were able to persuade a doubting public of the veracity of their claims. Previously held views that disease developed spontaneously or was dependent on the weather or on other aspects of environmental change fell by the wayside.

Soon laboratories throughout the world were working full time on the subtleties of infectious disease. Joseph Lister’s work on antiseptics was validated by demonstration of bacteria in infected wounds. The benefits of good hygiene and sterilisation of instruments became accepted, and quarantine laws requiring isolation of the sick could be acted upon with an improved understanding. In almost every application the new science of microbiology seemed to hold sway. Vaccination against infectious disease became part of the new biotechnology and in 1928 penicillin was discovered by Alexander Fleming.

This new weapon against the microbial enemy heralded the development of more antibiotics. Early success was impressive and soon the medical and veterinary professions and their public came to

depend upon the pharmaceutical industry's 'magic bullets'. In recent times the bullets have lost some of their shine. Newspaper reports speak about the emergence of resistance as the microbes evolve chemical defences to the antibiotics. And while the antibiotics fail to kill harmful bacteria they continue to harm the body's beneficial microbial populations. In the absence of helpful bacteria, yeasts, fungi and super-resistant bacteria come to predominate.

While these problems seem to be of the modern age it is more a case that the problems are only now being recognised. Where the germ theory accentuated the importance of microbes, a new realisation now emerges. The patient's physiology, age, sex, nutrition and previous exposure — aspects of the environment — are of equal significance. Ironically Louis Pasteur, the originator of the germ theory, while on his deathbed, reportedly said: 'The terrain is more important than the germ'.⁷ Considering the breadth of the terrain that influences bacterial disease, it is remarkable that the germ theory has enjoyed such success. But this again serves to illustrate the power of paradigms, for even though the theory is flawed its exponents believed it with a passion and within its rigid confines were able to force the discovery of remarkable new information.

In the germ theory a disease is said to be of bacterial origin if it 'fulfils Koch's postulates' — by which is meant:

- The micro-organism must be present in every case of the disease.
- The micro-organism must be isolated and cultivated in pure culture.
- Inoculation of such culture must produce the disease in susceptible animals.
- The micro-organism must be observed in and recovered from the experimentally infected animals.⁸

However, in most cases, fulfilment of the postulates requires a good deal of licence — scientists have been known to fudge the evidence and make approximations to support their case — and even with highly contagious diseases not all susceptible individuals succumb to infection. Koch's postulates, which used to be accepted with certainty, are now surrounded with doubt.

Abandoning or tempering the germ theory seems like heresy in light

of past achievements but that is exactly what should now occur — an eclectic theory of disease can then arise. With the benefits of knowledge generated by the germ theory and with the aid of computer technology it is now possible to handle large volumes of information in a flexible format. Patterns of disease, health and suboptimal health can be obtained instead of the old rigid bipolar division — sickness and health.

Disease treatment paradigm

Conventional doctor/patient relationships have changed little over thousands of years. In all societies the medical man enjoys special status and patients are generally appreciative of the service provided. The framework of the relationship can be said to fulfil three conditions of a paradigm. First, there is a long history of achievements; some bordering on the miraculous where the sick have been healed. Second, the innumerable departures from health provide the particular medical profession with plenty of problems. Third, the profession has access to a number of solutions.

Although not exclusive, the main focus of the relationship is to treat existing ill health — usually end-stage disease. People consult a doctor, dentist or veterinarian when they perceive they have a problem. There is a subjective assessment, but they expect that the medical person will employ objective means to arrive at a diagnosis and recommendation for treatment. Caught in this cycle of expectations the medical professions and patients have subscribed to the view that solutions are always available; it is just a matter of doing more tests with ever more sophisticated equipment. Similarly technology and the pharmaceutical industry can be relied upon to deliver increasingly sophisticated surgical and drug treatments.

Now, I don't wish to appear a Luddite and I am the first to consult a doctor when I am sick. However, I am concerned that this paradigm of techno-medicine so often fails to deliver the goods or indeed actively does harm. And I am far from alone in this view. In 1972 Archie Cochrane, a British medical researcher, published his book *Effectiveness and Efficiency* in which he drew attention to the lack of systematic reviews of current medical treatments (and preventive methods).

Cochrane Groups have since become established throughout the world, their systematic reviews often demonstrating that existing treatments are neither objective nor helpful.

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medicine. Some exceptions occur, for instance treatment of a cough coupled with advice on how to stop smoking. Direct, detailed advice on the promotion of good health is seldom provided. Occasionally doctors promote breast feeding for infants and healthy diets and exercise for adults. More commonly such advice is seen as part of another paradigm —

a function of health education in schools and media rather than a matter for medical practitioners.

As discussed in Chapter 9 the dental profession used to be locked into the same doctor/patient contract of providing treatment when the patient presented with a problem. Old-time dentists could point to their success in alleviating pain and obliterating cavities. They simply pulled those teeth which could not be filled — and the patients did not complain. Fortunately some dentists realised that passively responding to demands was not the best way to serve the interests of their patients. The concept that the need for treatment implies a failure of prevention enables dentists to shift focus and hence the greater preventive orientation of modern dentistry.

In the veterinary sphere there is no Cochrane Collaboration for the review of treatments. And we have no reason to believe that veterinary outcomes are better than those obtained by the medical profession. In response to requests from clients veterinarians employ ever more sophisticated diagnostic techniques leading to ever more expensive medical and surgical interventions. Students are taught at veterinary school to be resolute in pursuit of the most esoteric diagnoses. At the Sydney University Veterinary School a machine, for the diagnosis of rare heart disease affecting a handful of old animals, and costing half a million dollars, was installed. Meanwhile the

students graduate with either wrong or misleading ideas regarding diet and dentistry affecting not some but all of their patients.

Pet owners caught in the treatment paradigm recount their veterinarian's heroic achievements. The story might involve mention of a four figure veterinary fee and a series of nasty afflictions of the skin, bowel and other organs. If you ask the owners about their pet's diet the answer may well involve a 'super premium' line of food sold by the veterinarian. On the subject of dentistry owners often recite veterinary advice to use a toothbrush. But the real needs of pets are not met by expensive treatments in the absence of effective preventatives. A new paradigm, emphasising prevention, would be a better option.

The accompanying box contrasts interpretations made by a veterinarian who subscribes to the existing treatment-based paradigm with interpretations made by a vet whose approach focuses on disease prevention and health promotion.

QUESTION/TEST	OBSERVATION	ORTHODOX VET ATTITUDE	ENLIGHTENED VET ATTITUDE
<i>Presenting Signs and Owner Observations</i>			
Tell me your problems	Sleeps a lot	Older dogs frequently do	Animals with chronic periodontal disease frequently do
	Restless sleeper — howls a lot	Ditto	Ditto
	Seems a bit stiff	Ditto	Ditto
	Seems bad tempered	Many cats are bad tempered	Cats with periodontal disease and 'neck' lesions suffer much pain
<i>History Taking</i>			
What diet do you feed?	Commercial 'complete and balanced' food	Excellent	That's a worry
Do you offer bones?	Large ox bones once a week	Good	That's a worry
Is your animal listless and slow?	Yes	Usual	That's a worry

QUESTION/TEST	OBSERVATION	ORTHODOX VET ATTITUDE	ENLIGHTENED VET ATTITUDE
<i>Clinical Examination</i>			
Cursory examination of mouth	Nothing noticed due to poor patient cooperation	All is probably OK	Visual observation yields partial information only
Sniff the breath	Rancid	This test not performed	That's usual, highly significant and likely to respond to dietary change
Skin/coat condition	Poor	That's usual	That's usual and likely to respond to dietary change
Abdomen shape	Flabby	Ditto	Ditto
<i>Clinical Aids</i>			
Thermometer	Temperature normal	That's OK	Thermometer seldom yields useful information in chronic disease
Stethoscope	Unremarkable	That's OK	Cardiac and pulmonary signs undetectable until too late to reverse
<i>Clinical Pathology</i>			
Haematology	Within reference range	That's OK	Reference range misleading
Biochemistry	Within reference range	That's OK	Frequently within the range until too late to effect change
<i>Examination under Anaesthetic</i>			
Oral	Apparently normal	That's OK	Periodontal disease is insidious and hard to detect—probing, tooth movements and gum shape are unreliable signs
Other	Apparently normal	That's OK	Conscious animals do not relate how they feel, anaesthetised animals reveal even less

QUESTION/TEST	OBSERVATION	ORTHODOX VET ATTITUDE	ENLIGHTENED VET ATTITUDE
<i>X-rays</i>			
Oral	Unremarkable	That's OK	Highly unreliable
Whole body	Unremarkable	That's OK	Collagen and other periodontal-induced diseases do not show up
Whole body	Heart, liver, kidney abnormalities detected	Needs treatment	Probable over-diagnosis of the problems — constant toxemia from mouth likely chief problem
<i>Diagnosis</i>			
	None made	Leave as is	Change diet +? scale teeth
	Suspect bacterial disease	Antibiotic treatment trial	Antibiotic treatment trial + change of diet +? scale teeth
	Suspect immune problems	Steroid treatment trial	Steroid treatment + change diet +? scale teeth
<i>Prognosis</i>			
	Standard for age of animal	Will have recurrent problems	Will likely not see the patient for several years

Reductionist paradigm

Perhaps the most powerful and successful paradigm of science is reductionism — reducing complex problems to component parts. This approach is already over 300 years old and dates from the days of Descartes, who wrote:

I consider the human body as a machine. My thought compares a sick man and an ill-made clock with my ideas of a healthy man and a well-made clock. I say that you consider these functions occur naturally in this machine solely by the disposition of its organs not less than the movement of a clock.⁹

In order to better understand the workings of this mechanistic world

Descartes resolved to:

Divide each of the difficulties which I examined into as many parts as possible, and as might be necessary in order best to resolve them.¹⁰

Nowadays we fall into reductionist analysis to such a degree that it seems not only the best but the only way of grappling with complex issues. The other paradigms of scientific enquiry are built on this foundation. For example, the germ theory, the disease treatment paradigm and the information in this book can all be managed if divided into bite-sized chunks. Early scientists reduced food to its component parts, which they named proteins, fats and carbohydrates. Further subdivision led to the discovery of amino acids (the sub-units of proteins), fatty acids of fats and the sugar molecules which make up carbohydrates.

But we need to take care with our reasoning as, like the other paradigms, this one is also flawed. While the divisions may seem logical to us they are in fact arbitrary. In nature there are no clearly defined units. Protein exists in cells in close and intricate association with water and a host of other chemicals. Cells exist in complex interaction with their neighbours and with other cells at remote locations via the nervous and circulatory system connections. By imposing our labelling system on the disembodied parts we rob those parts of their vital interconnectivity.

We saw an aspect of that in Chapter 4 where we examined the folly of trying to reassemble a whole raw rabbit from what are believed to be its component parts. In that case we saw that the whole raw rabbit is more than the sum of its named chemical constituents.

Linear relationships

Other oft unstated assumptions bedevil the reductionist model of scientific enquiry. One such assumption is that elements of complex systems vary in direct proportion to one another in what is described as a linear relationship. When plotted on a graph linear relationships produce a straight line. In the laboratory where conditions can be

standardised it is possible to progressively add a known carcinogen, for example a food colourant, to rats' diets and then check the rate of increase in cancers during a six week period. But in the real world relationships are non-linear; things are not strictly proportional and continue much longer than six weeks. The same food colourant when fed to dogs will be consumed in widely varying proportions by old and young, sick and healthy, pregnant and non-pregnant animals over a lifetime. Not surprisingly, and should the investigation be carried out, there is no neat, straight line graph which captures the relationship of the chemical intake with the state of health of the animals — in the real world statistics are brought into play, but as we shall see they have major shortcomings too.

Belief in linearity infests all corners of scientific endeavour, and life in general as well. We often assume a big stimulus will give rise to a big outcome. For instance a billiard ball struck with great force travels further and faster than one just nudged by the cue. However, even in the mechanical world small events can lead to disproportionate outcomes — for instance lightly squeezing the trigger of a gun serves to propel a bullet at great speed. Greater force applied to the trigger does not increase the speed of the bullet. Medical researchers have studied the nexus between severe periodontal disease (a big stimulus) and heart disease and stroke — both 'big' outcomes. But perhaps mild or persistent periodontal disease has the same effect. Maybe it acts as a trigger which, combined with other factors, for instance stress and cholesterol, can give rise to severe systemic disease. To find the answer researchers will have to shelve assumptions and design complex experiments — not an easy task.

Unidirectional causes

A particularly worrying aspect of the reductionist paradigm is the belief that life's intricacies are due to

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unidirectional causes which produce predictable effects. In the first instance we can say that influences are not unidirectional. As the quantum physicists showed, the electrons in an atom are each

dependent upon the others for their precise location and movement. Similarly there are multiple feedback mechanisms regulating the internal environment of the mammalian cell, organ, body, family group and ecosystem. Instead of causality we should be speaking about connectedness of the constituent parts.

Of course if the word ‘cause’ is used to mean the most recent event in a series, or the trigger for a cascade of events, then the word can have some utility. Generally its use depends on the perspective of the observer. Commenting on an outbreak of food poisoning in an HIV AIDS community, an immunologist might implicate reduced white cell counts as being the cause of the problem. A bacteriologist might say the cause was a strain of salmonella bacteria, while a religious fundamentalist might say that the patients had sinned and thus caused their own downfall.

But gradually, as the utility of the reductionist paradigm is called into question, so is the concept of causality. The following quote from the World Cancer Research Fund sounds more like an apology than a statement of conviction:

The concept of causation is used as a tool to understand the world and the way it works, without necessarily thinking about what ‘cause’ means. Causation is an *interpretation* placed on an *observed association of events*. The causal process can never be directly observed; it is always *inferred*. Scientists in any discipline, physical, chemical or biological, whether doing an active experiment or observing a natural system, *cannot absolutely prove causation*, and it is always possible that further research will produce evidence that changes conclusions. Nonetheless, *scientists can be more or less confident* of the causal interpretations that they place on associations observed as a result of research, *depending on its type and quality* [emphasis added].¹¹

If you look at this quote — concentrating on the words in italics — you will see that the entire enterprise is a subjective venture surrounded by semantic constructs designed to preserve the world view of the scientists who populate the dominant field of endeavour.

The disclaimer at the end, *'depending on its type and quality'*, confirms that it is someone's arbitrary view that qualifies the suitability of the research and whether the so-called causes have any validity.

Niels Bohr, father of quantum theory, said in Chicago in 1933:

We have been forced to recognise that we must modify not only all our concepts of classical physics but even the ideas we use in every day life... We have to renounce a description of phenomena based on the concept of cause and effect.¹²

Professor Alan Watts of the University of California echoed those sentiments when discussing the case of a cat passing a hole in a fence through which someone was looking. He posed the rhetorical question: Would it be fair to say ... since the cat's tail appeared after the head, that the head somehow caused the tail? Or alternatively, should the cat walk backwards past the hole, could the tail then be said to cause the head?¹³

Fortunately others are beginning to call into question the linear, reductionist, unidirectional, cause and effect model of scientific enquiry. *Saunders Veterinary Dictionary* defines cause in disease as:

an agent, event, condition or characteristic which plays an essential role in producing an occurrence of the disease. Because there is nowadays much less certainty about what actually establishes a disease state it is becoming more common to use terms such as disease determinants, causal association, causal relationship. Koch's postulates are no longer the sole criterion used in establishing causality.¹⁴

Slowly, ever so slowly, the reductionist paradigm of causal connections is surely on the wane. Meanwhile I recommend that you listen carefully as scientists speak. Be reassured if you hear them employ a holistic outlook in which the reductionist approach is used as a tool. If their utterances are littered with the word 'cause' then please be wary — it suggests an overemphasis on reductionism.

Measurement

Reductionist science puts great faith in the creation and interpretation of data. As is frequently quipped: 'What gets measured gets done; what is important gets ignored.' Dr Rick Atwell, a veterinarian at the University of Queensland, puts the point gently when he says:

Subjective assessment can be just as important and by its nature is accepted with less stigma and finality than is a hard figure, which is often given more authenticity and authority than is deserved.¹⁵

In practice the use of figures is taken to extremes. One example involves the American Association of Feed Control Officials (AAFCO). This United States body, made up of government, university and company representatives, oversees the contents and labelling claims of a vast range of animal foodstuffs. Various subcommittees report on the constituents of artificial pet foods and, where once the National Research Council (NRC) was considered the primary authority on pet foods, that role is now fulfilled by AAFCO and its subcommittees.¹⁶

If you look at the side of a packet of artificial pet food, you will often see a claim that the contents meet AAFCO guidelines. This is the gold standard by which the consumer is supposed to be assured of the adequacy of the product. AAFCO lists its test protocols for 'proving' that an artificial dog food is 'complete and balanced' and suitable for feeding to a dog for life (see the accompanying box¹⁷). No reference to how closely a foodstuff compares to the chemical and physical form of a natural diet but a surfeit of measurements instead.

Consider that any artificial foodstuff is manufactured according to reductionist calculations for quantities of carbohydrates, fats, proteins etc which bear scant relationship to the actual diets of wild carnivores. AAFCO then sets out to validate those calculations using another set of arbitrary figures. Figures relating to the number of dogs (8), weeks spent in a cage (26), some physiological measurements and the dogs' weights. But, says AAFCO: 'No dog shall lose more than 15% of its initial body weight.'

AAFCO FEEDING PROTOCOLS FOR DOG AND CAT FOODS
MINIMUM TESTING PROTOCOLS FOR PROVING AN ADULT
MAINTENANCE CLAIM FOR A DOG FOOD.

DOGS

A minimum of eight healthy adult dogs at least one year of age and of optimal body weight is required to start the test. All animals starting the test must pass an initial examination by a veterinarian. Bitches in gestation or lactation shall be excluded.

DIET

The same formulation shall be used throughout the test although different production batches may be used. If a concurrent control group is used, the diet fed the control group must have been demonstrated to meet the maintenance requirements of the dog as determined by AAFCO feeding protocols.

DURATION OF TEST

The test shall run for a minimum of 26 weeks.

FEEDING PARAMETERS

The test diet shall be the sole source of nutrients except for water. Dogs shall be fed ad libitum or based on energy needs. Fresh water shall be provided ad libitum. Any interruption in feeding protocol must be disclosed and may invalidate the test.

CLINICAL OBSERVATIONS AND MEASUREMENTS

1. Daily food consumption may be measured and recorded.
 2. Individual body weights shall be measured at the beginning, weekly and at the end of the 26th week of the test.
 3. RBC number, hemoglobin, packed cell volume, and serum alkaline phosphatase and albumin shall be measured and recorded at the beginning and at the 26th week of the test.
 4. All dogs shall be given a complete physical examination by a veterinarian at the beginning and at the end of the test. Each dog shall be evaluated as to general health, body and hair coat condition, and comments shall be recorded.
 5. Any medication and the reason for its use must be recorded.
 6. A number of dogs, not to exceed 25% of those starting the test, may be removed for non-nutritional reasons. The reasons for their removal must be recorded. Dogs may be removed for non-nutritional poor food intake only during the first two weeks of the test. Data already collected from dogs removed from the test shall be retained although it does not have to be included in the final results.
 7. A necropsy shall be conducted on any dog which dies during the test and the findings recorded.
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INTERPRETATION

- A. The diet shall fail if any dog shows clinical or pathological signs of nutritional deficiency or excess.
 - B. All dogs not removed for non-nutritional reasons must successfully finish the test.
 - C. The average percent body weight change (final compared to initial) of the group shall not be less than either: ... [certain criteria are laid down including: 'No dog shall lose more than 15% of its initial body weight.']
 - D. The average final RBC number, hemoglobin, packed cell volume and serum albumin values shall not be less than either: ... [certain criteria are laid down]
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In almost every sentence of the protocols there is a statement sufficient to destroy credibility of the test. For instance the requirement: 'All animals starting the test must pass an initial physical examination by a veterinarian.' From our knowledge of periodontal disease we should expect to find processed food fed dogs entering the test already suffering from the disease and thus failing the test. If perchance they happened to be free of the disease then a 26 week period eating a canned or dry diet would ensure the development of a foul mouth.

Much of the protocol seems to be a public relations exercise rather than a genuine attempt to screen unsuitable products. Item 5 requires the use of medication to be recorded, item 6 requires the reasons for removal of dogs to be recorded, and item 7 requires necropsy results to be recorded. But once sick, removed or dead dogs are recorded there appears to be no obligation on anyone to do anything. Perhaps the most damning aspect is that the test is done in-house by the manufacturer. An affidavit of accuracy needs to be filed — seemingly impossible unless definitions are distorted — and from that point on millions of tons of product can be sold carrying the claim that it has passed the AAFCO test.

Dr R L Wysong fulminated against the 'confusion, even blindness' of high-ranking veterinary authorities who support the extraordinary AAFCO procedures. As an example of this blindness Wysong quoted a statement from the October 1992 *Veterinary Forum*, in which the authors refer to AAFCO studies when they say:

These protocols were designed to assure that pet foods would not be harmful to the animal and would support the proposed life stage. These protocols were not designed to examine nutritional relationships to long-term health or disease prevention.¹⁸

Wysong sums up the issue:

In other words a food could cause disease and destroy long-term health yet at the same time 'not be harmful' and be '100 percent complete'! So after a pet has been fed the 'proven' food for a period of time equal to the duration of an AAFCO study (26 weeks), all bets are off. The '100 percent complete and

balanced' food may then be literally poisoning the animal with the blessings of the entire academic, professional, scientific, governmental and industrial pet food establishment.

Since the artificial pet food manufacturers shelter behind the AAFCO badge of approval I decided to investigate further. In 1993 I wrote to the committee concerned noting that two of the eight dogs starting the test could be removed and asking:

- Should animals undergoing tests develop gastric dilatation volvulus [distension and twisting of stomach] or intussusception [telescoping of the bowel], would this be an appropriate reason for withdrawal?
- Would the condition be listed as a nutritional or non-nutritional reason for withdrawal?
- Should animals be removed from the test due to gastric dilatation volvulus or intussusception, then how would this affect the test result for the food being trialed?

In less than a month I was astonished by the reply. The lengthy statement, on a Federal Drug Administration letterhead, was signed by Dr David Dzanis of the Center for Veterinary Medicine. As chairman of the AAFCO committee which revised the protocols, Dr Dzanis declared that dogs could indeed be removed due to gastric dilatation volvulus or intussusception and the food could still pass the test (see Chapter 6 regarding GDV and intussusception). In Dr Dzanis's view the conditions would be deemed non-nutritional. In further correspondence with Dr Dzanis regarding the test subjects suffering from periodontal disease I received the reply:

Regardless, although periodontal disease may be a food-related problem, it is not a nutritional problem per se. Thus, the AAFCO feeding trials do not address this aspect.

'The '100 percent complete and balanced' food may then be literally poisoning the animal with the blessings of the entire academic, professional, scientific, governmental and industrial pet food establishment.'

Dr R L Wysong

Deductive reasoning

Perhaps it should not come as a surprise that the officials making up the AAFCO committees are locked into a mindset that deems numbers to be important but overt fatal disease to be of little or no concern. Some committee members work for artificial pet food companies and others work in close association. While this provides a possible reason for faulty decisions, it does not explain or excuse the use of flawed logic. Logic is a system of thinking that we use to make reasoned judgments on things affecting our lives. We are not able to observe directly the reasoning processes of scientists, but from their utterances, either verbal or in written form, we can make judgments. That scientists can be careless about following the rules of logic to the point of damaging their own credibility has always, for me, been perplexing.

There are two main types of logic, inductive and deductive. Inductive logic allows us to derive a general principle by observing particular events. We tend to say: ‘This crow is black so all crows must be black.’ For practical purposes that assumption usually holds — until we encounter an albino crow.

Because there is scope for debate regarding the uses of inductive logic we need not dwell on it here; although scientists, like all people, are adept at manipulating the strengths and weaknesses of inductive arguments for their own purposes. The other type, deductive logic, imposes rigorous requirements ensuring that conclusions follow from the initial premises (statements of fact or assumption). Such arguments are said to be valid. When the premises are true, and providing the rules of deductive logic are followed, then the argument is said to be sound and the conclusion will also be true.¹⁹

Logical content

But we need to be wary. An argument can be logically valid and seem plausible even though the content, the initial premises, may be false. As the saying goes, ‘garbage in; garbage out’. One pet food company spokesperson is rumoured to have told a newspaper reporter: ‘Give me a tyre, an old leather shoe and a quart of oil and I can meet the specifications for the NRC diet.’²⁰ I suspect that he was only half joking because the actual contents of the packet comprise soy bean and maize

and a host of bizarre chemicals — ingredients which, the companies tell us, are either beneficial or necessary for the wellbeing of our pets.

False premises are so deeply embedded in the artificial pet food mythology that the National Research Council publications on the nutrient requirements of dogs and cats make the statement: ‘Dogs/cats require specific nutrients not specific feed stuffs.’²¹ This implies that animals do not require natural foodstuffs such as whole raw rabbit but that chemicals — for instance those found in tyres, old shoes, engine oil and other garbage — will suffice.

Logical form

For an argument to be considered logically valid the conclusion must follow from the premises. In the next two examples the premises (1 and 2) are both true, but the conclusion (3) is false, as a result of faulty logic.

1. This commercial pet food is 100 percent complete and balanced as defined by the NRC guidelines.
 2. Eight adult dogs, undergoing an AAFCO trial, can live for six months on this diet.
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3. Therefore the diet is proven suitable as an adult maintenance diet for dogs everywhere.

1. We are respected manufacturers/professionals/bureaucrats.
 2. There are laws governing our industry/profession/bureaucracy.
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3. Therefore what we say is true and our product/service/administration is wholesome/good/effective.

Bureaucrats and regulators are renowned for their ability to use false premises and invalid logic in their resolve to serve the status quo. Dr Gerald Guest, Director of the US Federal Drug Administration (FDA) Center for Veterinary Medicine, had this to say:

As the United States federal regulatory body charged with

ensuring the safety of animal foods and drugs, the Center for Veterinary Medicine is also concerned about the effects of pet food products on oral health.

In fulfilling this mandate, the Center must rely on scientifically sound data generated from well-controlled studies as the basis for its regulatory decisions. Any information of this nature you may offer, particularly scientific studies published in peer-reviewed journals, would be of substantial benefit.²²

Unfortunately the information I sent to Dr Guest seems to have been either ignored or dismissed. But in any case the regulatory function of the US FDA should not depend on my searches of the scientific literature — they have staff employed for the purpose. One such staff member, Dr David Dzanis, Veterinary Nutritionist at the Food and Drug Administration, also chaired the AAFCO pet food committee. As we saw, AAFCO protocols cannot be considered ‘scientifically sound’ or dependent on ‘well-controlled studies’. That the FDA believes it can fulfil its mandate to make ‘regulatory decisions’ while being closely allied with AAFCO is, in my opinion, a matter warranting investigation.

Statistics

Statistics and nuclear power share features in common — they can be of immense public service or immense public threat. And the threat is not always intentional, as mistakes do happen. The power of statistical analysis can turn incomprehensible mountains of raw data into coherent information. Similarly those with a good grasp of statistical method can tease out subtle relations between factors under investigation. The trouble is that those with the good grasp of statistical method are usually not the people who perform the scientific research.

Ian McCance reviewed, for their statistical content, 279 papers in 23 consecutive issues of the *Australian Veterinary Journal*.²³ He said that only 29 percent of the papers would have been acceptable to a statistical referee without revision; revisions would have been needed in 66 percent; and the remaining 5 percent had major flaws. In passing comment on the review John Ludbrook told readers that

‘statistical flaws revealed by McCance’s review are no different in quality or quantity from those that can be found in other life science journals’.²⁴ Some of the conduct, Ludbrook argued, did not originate from ignorance and was on the borderline of scientific fraud.

Of course, those researching and ‘proving’ the alleged benefits of artificial pet foods make extensive use of statistics. The validity of those statistics, and the way they are reported, are beyond the ken of the majority. In 1995 the *British Medical Journal* published a paper indicating that, when it comes to the use of statistics, trained health care professionals often get the answer wrong. When asked to evaluate four ‘different programs’ only three out of 140 professionals spotted that the different results referred to were in fact the same set of statistics expressed in four different ways. If trained people experience such difficulties with data the dangers for you and me are likely to be considerable.²⁵

Statistical traps abound. Sometimes research scientists set a trap to catch the unwary and sometimes they unwittingly fall victim to the trap themselves. The ‘correlation does not imply causation’ trap represents a good example. In an AAFCO feeding trial 100 percent of the dogs consume the test diet 100 percent of the time. If all pass the final veterinary examination some observers might conclude that the statistics prove the diet correlates with and therefore *causes* a successful outcome. But the water the dogs drink and the air they breathe have the same 100 percent correlation. Clearly food, water and air *permit* the dogs to survive until the final veterinary test, but they do not *cause* the outcome of that test.

Altman and Bland drew attention to an important aspect of statistics in their paper entitled ‘Absence of evidence is not evidence of absence’.²⁶ A dramatic illustration of this principle involves not just lack of correlation but total lack of evidence — artificial pet food advocates make much use of this trick. Whenever they fail to use naturally fed control (comparison) groups of animals they avoid providing evidence on the success of a natural diet. And when evidence adverse to the pet food industry is generated, whether in a company laboratory or elsewhere, it is easy to withhold that evidence.

Random and uncertain findings result from poorly conceived

and badly conducted experiments. While this may suit artificial pet food makers, we should bear in mind that some of the research performed in the absence of natural controls involves studies relating to human health. When I pointed out to the veterinary director of a medical research facility that their colony of dogs, fed a commercial dry food, was likely to be adversely affected by the chemical and physical form of the food, I was met with a shrug. The director said there was no evidence their experimental results were compromised, nor did it matter that dogs seek to disguise evidence of ill health.

A particularly distressing example that ‘absence of evidence is not evidence of absence’ involved a research project at the University of Sydney. A group of veterinarians operating as the Australasian Veterinary Oncology Group set out to test the effects of chemotherapy on cats affected with malignant cancer of the lymph nodes. I wrote to the University Ethics Committee suggesting that it would be wise to assume that animals in the trial would be likely to suffer the combined adverse consequences of:

- an unnatural diet
- a foul mouth
- a clinically diagnosed lymphosarcoma
- administration of Doxorubicin, a cytotoxic agent.

I went on:

All, except the lymphosarcoma, will be under the control of the researchers and as such must be seen as a cruel infliction of suffering. Any experimental results arising out of such trials must at best be applicable to a set of diet and periodontal disease affected animals only.

The Ethics Committee fobbed me off, as did Professor Margaret Rose, Chair of the NSW Animal Research Review Panel, when she told me: ‘we all have to accept that we are not always going to get the outcomes that we might want to achieve’.²⁷

When the Australian National Health and Medical Research Council (NHMRC) revised its code for the care and use of experimental animals they reviewed submissions and inserted the statement:

‘Consideration should be given to providing variety in the composition and presentation of food.’ Evidence demonstrating carnivore dietary imperatives appears to have been discounted.²⁸ As recently as 1995 the US Food and Drug Administration wrote saying that they had not received any ‘scientifically sound data’ from me ‘or any other source’ regarding the ‘effects of pet food products on pet health’. Perhaps publication of this book may prompt discovery of the evidence?

Controversy over human health and pet ownership

When the international science magazine *New Scientist* ran a cover story entitled ‘Secret power of pets’, the Pet Care Information and Advisory Service (PIAS), a division of the Mars Corporation, claimed that two pieces of research ‘demonstrated irrefutably a correlation between human health and pet ownership’. PIAS sent glossy copies of the article to health care professionals in order that ‘all interested parties have accurate and reliable information on the human–companion animal bond’. They urged all

who are in some way involved in the health field — be it direct involvement as a doctor or other health care worker, or indirect involvement as a formulator of broad social policy — to use this article to help familiarise themselves with the key issues. Regardless of whether or not one is a professed ‘animal lover’, it is becoming increasingly clear that when considering the overall health of our society, the role of companion animals must be taken into consideration.²⁹

PIAS did not mention that the Mars Corporation pays for much of the so-called research which generates the purported ‘accurate and reliable information’. Tania Ewing, journalist on *The Age* newspaper, explains it this way:

Australia’s pet ownership is declining and the \$1.5 billion [estimated annual sales] pet food industry is worried.

As families get smaller, and inner-city living becomes more

popular, fewer people are adopting a moggie or mutt.

But at least one pet food company is fighting back, determined to keep Australia one of the highest pet-per-person countries in the world.

The pet food giant Uncle Ben's Australia is 'promoting socially responsible pet ownership' by sponsoring medical research, conducting widespread programs on pets in primary schools and running TV commercials.³⁰

Prominent in the enterprise was Professor Warwick Anderson, Chair of the Medical Research Committee (the committee which oversees grants to research projects) within the National Health and Medical Research Council. Together with PIAS veterinarian Jonica Newby he starred in a TV 'community service announcement' promoting pet ownership and undertook research on the benefits of pet keeping. In his article 'The benefits of pet ownership', published in the *Medical Journal of Australia*, Professor Anderson told readers:

The place of animals in Australian society is under scrutiny, and owning pets can no longer be taken for granted. Newspapers trumpet about how dog faeces pollute city streams and rivers as well as footpaths; cats get bad press because their predatory nature leads them to kill native birds and mammals. We are understandably upset when a rottweiler or pit bull terrier that has been trained to attack people does just that, with tragic human consequences... It's no wonder that pet ownership is falling... Should any of us (other than veterinarians and pet food manufacturers) be concerned about this? The answer is 'yes'. For while the main benefit that pets confer is probably companionship, it is very likely that better health is another benefit.³¹

Professor Anderson went on to say:

From the findings of less frequent visits to a doctor in the National People and Pets Survey and estimation of lower use of medication for cardiovascular disease, we calculated these savings to be in the order of \$800–\$1500 million.

The National People and Pets Survey was a telephone poll of 1011 people conducted by a market research company for the Urban Animal Management Coalition. Major pet food companies and pet industry organisations contributed to the survey.

Dr Jonica Newby, who assisted with Professor Anderson's research,³² promoted his findings in a book published by the Australian Broadcasting Corporation:

With more and more people living in cities and alone, studies have shown that keeping pets may be essential for our health. Research suggests the savings to health care could be in the billions. Yet our city councils legislate against pets and our town planners ignore them.³³

'Better than a dose of medicine', said a family health magazine endorsing pet ownership.³⁴ Mars Corporation executives surely echoed those sentiments. It must have seemed that they had found the \$1.5 billion antidote to the bad press arising from dog poo, stray animals, devastated wild life, dog bites, cat scratches, pet-induced traffic accidents, escalating veterinary fees and noise nuisance.

Others were skeptical. Dr Anthony Jorm, researcher at the Australian National University, noticed that Professor Anderson's claims in the *Medical Journal of Australia* had not been subjected to the usual peer review process and the methodology employed seemed doubtful. Within a year Dr Jorm had designed an objective study — 'To determine whether pet ownership by elderly people is associated with lower use of health services' — and done the research and published a peer-reviewed paper.³⁵ His results showed that: 'Elderly pet owners did not differ from non-owners on any of the physical or mental health measures or in use of health services.' The implications were clear: instead of health care savings 'in the order of \$800–\$1500 million', the savings were quite possibly zero.

Professor Anderson was unavailable when journalists sought comment.³⁶ Jonica Newby accepted an invitation to comment in *Vic Vet*, newsletter of the Victorian Division of the Australian Veterinary Association. Two years later *Vic Vet* revisited the controversy. Readers

were reminded of Jonica Newby's allegations of 'spurious concerns and misleading statements by Jorm et al.' and her opinion that 'one negative result doth not bring the whole edifice crumbling!'.³⁷ *Vic Vet* then provided details from a second article which echoed the Jorm findings and cast further doubt on Professor Anderson's calculations.³⁸

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