

Veterinary Dentistry

**Refresher Course for Veterinarians
In association with Australian Veterinary Dental Society**

Proceedings 212

14 - 17 June 1993

Venue: Stephen Roberts Lecture Theatre, University of Sydney



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Preventative Dentistry

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Summing the effects of toothbrushing, flossing and fluorodation has transformed human dentistry. Logarithmic improvement in the health of companion animals can be expected from the adoption of natural prevention strategies. Veterinary dentistry will be relegated to a minor role and profound changes will overtake veterinary science.

Understanding the Mechanisms

How can such a turnaround be effected when "more than 85% of dogs and cats over the age of three years are suffering from periodontal disease to a degree that would benefit from treatment". Watham International Focus, Vol 1, No 3, 1991. The answer is hidden in the literature and a few quotes will point the way.

The test confirmed the feasibility of preventing the accumulation of dental calculus in experimental beagle dogs by regular weekly feeding of oxtails. Brown and Park 1968.

The dogs affected with paradontal disease are those fed on soft, pappy food; those fed on a diet which necessitates the use of their teeth for the grinding of their food are free from the disease. Sir Frank Colyer, 1947.

Uncooked bones had the most marked effect followed by rawhide chews and super hard baked biscuits. It is imperative that in addition to this basic commercial diet bones, preferably or rawhide chews or super hard baked biscuits be added to it so that periodontal disease can be prevented. PC Higgins, 1987.

Overcoming Existing Prejudices

Reaching a level of enlightenment, in retrospect, has been relatively straightforward. Much like the solving of a Rubic's cube it was necessary to purposefully adopt wrong positions in order to finally lock into place the coherent pattern.

Initial surprise at the 85% figure led to anger that we could allow such widespread, slow torture. Even for me, advancing years produces a softening of attitudes and this was the required key to unravelling the mystery. The softening attitude allowed the intellectually sound approach of assuming the opposite. If 85% were affected then perhaps periodontal disease was either a (a) trivial or (b) desirable feature of small carnivore biology.

Trivial

Indications were that this was far from trivial.

"What's more, research indicates that dogs with periodontal disease may develop further problems in the

heart, liver, kidneys or bones marrow." (Upjohn Company Poster 1992).

"Veterinarians have long suspected and research supports the fact that periodontal disease can become systemic and can predispose the animal to problems such as right-side heart failure, hepatic compromise, renal failure and bone marrow depression. This anachoretic effect can have drastic repercussions on the overall health of the pet and presents one of the greatest challenges facing small animal practitioners today." G Beard 1991.

But wait a minute. Doesn't it usually start with relatively minor gum disorder before progressing to the major entity? Isn't this gum disorder readily fixed by massage?

"Gingivitis can be cured in about four or five days. The secret is actually to clean the bleeding gums more, not less. This tends to run counter to normal medical advice for other bleeding areas of the body. However, gums are different. On the first day, the gums will bleed and feel sore. The second day the gums will bleed more and feel even sorer. The same thing will happen on the third day, by which stage you may be saying that the whole treatment is madness and you may be thinking of giving up. Do not! By about the fourth to fifth day the gums will start to feel better and become firm and healthier. This will be noticeable by the virtual absence of bleeding. A day or so later the gums will not bleed at all upon brushing."

Produced by the Dental Health Foundation - Australia, The University of Sydney, NSW 2006.

So nature has arranged the cure to be simple cleaning and massage taking place at each natural feeding session. Indeed a trivial matter if attended to early in the piece.

We still have the problem of:

Desirable

Accepting that the disease was trivial required some effort. Accepting that a severe disease with devastating consequences was desirable would require a somersault. Or alternatively one could question the validity of this seemingly absurd enquiry. Garbage in, garbage out. Ask the wrong question and obtain a lie. The semantics might be getting in the way here.

Until breakthrough

In the immortal words of Arthur Lee, it is desirable that "all that lives is gonna die". Periodontal disease might prove to be the desirable means to secure this outcome.

A quick reference back to the trivial side of the equation and we can now see that coupled together we have a balanced statement.

Ingesting natural foodstuffs at natural intervals will control impending gingivitis.

Failure of the feeding function allows the accumulation of plaque, the development of gingivitis and progressive periodontal disease.

The expanded cybernetic hypothesis of periodontal disease says that it is an essential link in carnivore population dynamics.

Periodontal disease is the dependable disease which modulates the effects of starvation in wild carnivore population dynamics.

- A feedback loop ensures daily chewing of raw meaty bones sanitises the oral cavity of the successful carnivore.
- Failure of the feedback loop facilitates multiplication of pathogenic bacteria within plaque and development of periodontal disease.
- Incremental losses of carnivores and herbivores are thereby facilitated.

- The populations of herbivores, carnivores and bacteria are maintained in dynamic equilibrium.

Unpublished work, T Lonsdale, December, 1992.

You may accept the logic so far but still remain unsure of the drift so let us adopt a couple of different perspectives.

"Day and night the Carnivora are playing their appointed part in keeping down numbers. They themselves are without visible foes, yet have a mysterious check on over-multiplication. All the flesh-eaters are more numerous at birth than the herb-eaters. But an unseen agency takes off cubs from every nursery, or the flesh-eaters would be too numerous, and would destroy all herb-eaters. Check and countercheck are constantly at work to maintain the balance and for the terrors of it all - they hardly exist!"

Childrens' Encyclopedia. Editor Arthur Mee

This lyrical passage of uncontested fact sets the carnivores in their ecological niche at the top of the food chain.

In the natural ecology things are infinitely varied and finely tuned. If we were to make a generalisation, the cats are hunters preferring their food warm and on the hoof or wing. The canines as a family being more content with an opportunist hunter and scavenger role.

A vital subset of the niche function is the consumption of bone. As humans we make a point of separating our meat from the bone. Carnivores consume virtually everything. Thus we can see they perform a vital function converting herbivore bones to powder prior to

return to the soil in readiness for the cycle to start over again.

The requirement for bone is so great that it translates into characteristic behaviour patterns. Aesop's Fables tell of the dog dropping the bone in the water when he stopped to threaten his reflection in the mirror-like pool. Tom Hungerford remarks:

"Rightly or wrongly, I regard the feeding of raw bones daily as being one critical factor in the health of dogs. Why is this? The crunching of the bones may clean the teeth. The enormous dental pressures of crunching bones may cause great circulatory changes in the jaws and gums. The primitive euphoria generated by the crunching of bones is obvious. To tease my dogs and take away their food is nothing, but to tease them and take away the bones causes a very definite reaction. The canine joy of crunching up bones is a daily feature of exhilaration and well-being which may have a bearing upon their immuno-competence and their immune system. Bones may have a nutritional effect (don't overlook trace minerals)."

In 1968, the Royal Veterinary College Expedition to East Africa reported a parasite cyst of hyenas tucked away in the pelvic bones of wildebeeste. The hyena target species have the jaws and digestive tract perfectly suited for digesting the hardest bones. That the parasite/host relationship was so well defined points to a long evolutionary process.

Setting aside how the environment has needs which are met by the carnivores lets us look at the needs of the carnivore satisfied by its food source.

This passage from the Australian Veterinary Practitioner establishes the ground rules.

We must then make the further assumption that the quality, quantity, and frequency of feeding are the prime determinants.

Quality - chemical and physical

- a. Chemicals Carbohydrates, proteins etc including the trendy taurines, arachidonic acid, Ca:P ratio etc suited to physiological needs of the animal.
- b. Physical Texture/temperature to ensure correct masticatory through to defaecatory process. Equally important physiological needs.

Quantity - chemical and physical

Our principle concern here is for the amount of cleaning that takes place in the oral cavity. Clearly one tough mouthful will not be sufficient quantity of chewy food to ensure a clean mouth. In dogs, experience shows that if raw meaty bones approximate to half the diet then other sticky foodstuffs will be adequately compensated. In the case of cats, the obligate carnivores, our experience indicates that almost every meal must consist of chewy, raw meaty bones.

Naturally the quantity of chemicals, absolute and relative, should occupy that zone between too much and too little.

Frequency of chemical uptake and physical stimulation

Clearly there is trade-off again in this area between frequency, quantity, and quality. Most carnivores can survive if fed once a week in large quantity and good quality. This is not an optimum and frequency of feeding probably differs between cats and dogs. Certainly frequency of gum massage and teeth cleaning needs to be at least once per day. This corresponds with the mineralisation of plaque beginning within 24-48 hours of deposition.

We can see that it is morphology and behaviour which serves to differentiate species. All species have roughly equivalent needs for the chemicals; carbohydrates, proteins, etc. To take two taxonomically different species which both eat trees we can cite termites and elephants. They both need trees for the chemical and physical constituents.

It would be a cruel hoax to fortify a heat-treated pile of sawdust with vitamins and minerals and then suggest that either the elephant or the termite could thereby sustain life.

Such an absurd proposition has now so insinuated itself into our way of thinking that we readily accept it for dogs and cats. Natural and unnatural ingredients are pulverised, blended, heat-treated and fortified with vitamins and minerals and placed before cats and dogs as their total requirements for life.

Making the Transition

From an early age we have been inculcated with the idea that domestic cats' and dogs' dietary needs can be met from the can or packet. By the time we get to university the subject is firmly in the hands of the biochemists who calculate the chemical formula.

Of course it is a trifle unnerving to have one's icons smashed with all in disarray and absence of familiar landmarks. A veterinary surgeon raised the following objections to feeding raw bones. (*See p. 238*)

Even if you withstand the onslaught designed to obstruct or impede your progress it still remains a tricky problem putting into practice the injunction 'feed a natural diet'.

Getting Started

Psychologists advise that your behaviour package is made up of four components:-

- How you act
- How you think
- How you feel
- Your body's workings (Physiology)

Taking on difficult tasks is best performed by doing the act and the other functions will line up. For instance

getting out of bed on cold mornings is not much helped by thinking about it. Best, 1) is to do it 2) become aware that it is happening 3) feel positive about accepting the challenge 4) notice the limbs beginning to free up.

Unfortunately as a practitioner making a cultural change there are so many cerebral and practical changes that need to be wrought. Then this whole package has to be sold to unwilling/unreceptive clients (often people who have received contrary advice from you in the past). The consequence of this is that no simple act will get you underway. Instead you will need to think through the process with all the attendant props.

Thinking through the process is not enough unless you conceive of a goal for the endeavour. I leave this goal to you but suggest you might see yourself playing an instrumental role in bringing widespread health to animals, cost savings to people and easing the burden on the environment.

Getting a handle on this will entail reading to the end including Dr Bennet's and Pollard's paper on consumer attitudes. Then re-reading the material before sitting down to adapt the recommendations to your particular situation.

Once you have thought through your props, strategy and goals you need to do some simulation exercises. Ideally you should be up to speed before tackling the real thing - just like a fighter pilot going through the flight simulator or the down-hill skier thinking through his descent.

Equipment, Visual Aids, Educational Material

The assumption I start with is that you have a general small animal practice with the usual facilities and equipment. If your practice is like ours then greater than 85% of patients have active periodontal disease and all of them need to eat food which is conducive to health, not a recipe for disease.

The chances are that your clients hold pet dental hygiene in low priority, are attending the clinic for reasons quite separate from dietary and dental health concerns. The trick is to shift the owner's focus away from the ostensible reason for the visit, vaccination, de-sex, skin rash etc and on to dietary and oral hygiene concerns.

Sales trainers tell you that "you need to believe in your product". Initially you may be a little sceptical that all health concerns can be overshadowed by diet and oral hygiene. Please let me reassure you that once underway you will develop a fierce conviction. Skilful use of equipment and visual aids will see you on your way.

In the Waiting Room

Arrange posters on dental disease, have a photo album of past cases and displays of faecal material. We have a pot of cooked bone fragments removed from constipated dogs. Normal faeces from bone-fed dogs is dry, firm and off-white. We soak our specimens in alcohol for 24 hours, then dry them before putting them in the specimen jars.

Objections	Verdict	Rebuttal
1. It is impractical.	False	Modern distribution and refrigeration make natural feeding easy
2. Previous dietary imbalance problems will arise.	False	Imbalance problems exist today as before. Better education and better access to people will enable us to eliminate imbalances.
3. It costs more.	False	It costs much less.
4. Some processed foods assist with dental hygiene.	Misplaced emphasis	Raw bone diet far outstrips biscuits and raw hide chews for dogs. Dry food exacerbates cat dental problems. (Higgins 1987)
5. Only a couple of bones need to be given weekly.	False	Consumption of bones is a powerful cleanser of teeth. Plaque and calculus are active between times.
6. Brachycephalic breeds cannot handle bones.	False	Started from a young age they soon learn. Given their predisposition to dental disease their need for prevention is greater. Brachycephalics are in the minority - why hinge any argument on the minority case.
7. Physically impossible for some breeds.	False	The raw bones and vegetable - carrot, apple etc can be selected according to circumstances. The brachycephalic breeds were genetically selected over hundreds of years of natural food feeding.
8. Little research has been done to justify natural feeding.	False	Evolution is an on-going experiment. Sir Frank Coyle and Peter Higgins list experimental and survey work.
9. Dogs live longer and have higher pedigree and therefore cannot cope.	Misplaced emphasis	Old pedigree dogs surviving a lifetime without bones become addicted to the wrong food and usually suffer painful mouth conditions making chewing difficult. There may be breed dispositions to problems but none documented.
10. Bones get stuck in the teeth.	Misplaced emphasis	An animal practised in handling the correct style of bone has little difficulty.
11. Teeth get broken.	Misplaced emphasis	Any system in use can become damaged. All systems require suitable exercise. Inappropriate e.g. ox marrow bone most likely to inflict damage.
12. Constipation is a problem.	Misplaced emphasis	Dogs habituated to bones have regular, firm stools of powdered bone. Bones fed once a week in large quantity can give rise to excessively dry stools. It is cooked, sharp, indigestible bones which are most associated with bowel problems.
13. Complete diet is impossible. (Meaning complete chemical).	False	Natural diets readily achieve complete physical and chemical needs.
14. Nutritional disease will become common.	False	Removing animals processed complete diets & putting them on natural diets has always resulted in increased health.
15. Deficiencies are bound to show up.	Unlikely	Processed foods have been implicated in most direct deficiency states. e.g. Taurine, arachidonic acid. In the hypothetical event that a deficiency is detected then appropriate action can be taken.
16. Excess nutrient disorders will occur.	Unlikely	Carnivores can process limitless quantities of bone. Many processed foods have excess salt and protein as judged by their own standards. (Cowgill, 1991)
17. Table scraps are no better than canned or dried food.	Misplaced emphasis	Scraps are cheap (free to user). Less highly processed, even raw. It is true they do not massage teeth and gums.
18. Raw bones and scraps not viable alternative.	False	They are available - cheap and health giving.
19. Legal implications of advising raw bones.	False	Nonsensical that recommending natural diet would carry legal penalties. Advising processed food giving rise to dental and systemic disease much more likely to invite legal action.

In the Consulting Room

At every treatment station where we may examine an animal there are a range of instruments including thermometer, stethoscope etc. An indispensable tool is the claw and spoon dental scaler which is used to point out particular problems in the mouth and perform immediate supra-gingival scaling. Testimonial letters are kept in a loose-leaf binder. Posters are used for illustration and the ubiquitous "poo pots" abound. Periodontal disease survey forms and a highlighter pen completes the picture.

Treatment Room/Wash Stand

Apart from the usual anaesthetic equipment the chief requirements are:

- a. Fluid therapy equipment, and
- b. Dental hand instruments.

A selection of Smith-Baxter gags are to hand and a series of champagne corks for gagging cats and small dogs. A polaroid camera is kept at the ready for recording events, both educational and litigation inspired.

Ward/Preparation Area

Extra freezer space is required for consignments of chicken carcasses and lamb bones. A microwave oven can be used for defrosting otherwise overnight retention in the refrigerator suffices.

Other Supporting Material

Local newspaper coverage makes excellent material for the waiting room noticeboard. Be sure to laminate any permanent display. A diet sheet is essential. Keep it simple and practical in orientation. Of course it must meet chemical needs of the animal and just as importantly the physical needs.

Our diet sheet is reproduced here. It is acknowledged that we may need to make amendments in the light of advancing knowledge (Nullius in verba. The Royal Society of London's motto adopted in 1660 means "No man's words shall be final".) For the moment we can affirm that all patients switched from well-known canned/dry/tablescrap diets have shown a marked increase in well-being. Puppies and kittens have thrived from the outset.

We rather assume that animals are free to eat soil, faeces and grass as part of the normal ingesta of carnivores. We allow that in the long run hyper- or hypo- conditions could arise and which could be corrected by dietary modification or in the extreme by the administration of supplements. We are content that the processed industry's mass destruction of taurine and arachidonic acid will not befall this diet. An encouraging rider; it seems almost impossible to feed too many bones. As one would expect of nature's bone recyclers; the more the merrier.

Do not forget to locate cheap sources of chicken carcasses, whole rabbits, kangaroo tails, lamb flaps, oxtails, chicken necks etc. You will need these products

for your in-patients and your clients will appreciate the information.

Protocols And Morale Building

Include the staff in all aspects. Lay staff will be forgetful and need constant reminding. Professional staff will be dubious and resisting. Provide a few successes, establish guide-lines and the troops will soon be smiling.

Our nurses are eager to provide clients with our updated literature with a covering "Please take our material on diet and dentistry. We have found it to be important. The vet will explain when he sees you".

Regardless of the reason for the visit every animal must have its mouth examined. To encourage a closer involvement of both vet and client the survey is frequently filled. Much information can be obtained. Above all it gets vets and clients to start taking account of halitosis. (You will have no doubt as to the prevalence or oral disease and the correlation with processed food once you complete a few forms).

One huge drawback of conducting the holistic approach is that it takes time. Clients come in to get their pet's flea dermatitis fixed up and we launch into a long, free discussion.

Raw Bones to Treat Fleas!

"One very important concept we have learnt is that animals eating a healthy diet and leading a healthy lifestyle have a healthy immune system. A healthy immune system can usually cope with average flea numbers.

Raw meaty bones daily keep mouths healthy, immune systems healthy and keep flea allergy dermatitis at bay."

Extract from client information sheet.

There is no opportunity to charge for the time because the clients do not ask for the service. The certain knowledge that animals will be back in a couple of years requiring dental work and heart, liver and kidney treatments unless we do provide renders us honour bound to give advance, preventative advice.

A few *bon mots* enable me to convey the message in a picturesque way. I stress the need for:

- Fresh air - we can live three minutes without it.
- Fresh water - we can live three days without it.
- Fresh food - we can live three weeks without it.

This enables clients to focus on what supports life.

But evolution provided a niche for each species and detailed the fresh food of the carnivore contrasted with sheep, cows, elephants and termites.

I stress that dogs and cats use their mouths as tools of trade for carrying out a diverse range of tasks. The delicate function of carrying the cubs contrasts with ingesting bone and cleaning the anus. Just as the carpenter can only expect to gain a decent living if he

maintains his equipment then the same applies to carnivores. This maintenance function is simply achieved by chewing bones, not merely as a chewing aid but as the very food itself.

Failure to chew bones results in the accumulation of plaque, necrotic gum, pus, putrefying food and faecal material. The equivalent of "suffering silently, sipping sewerage seven days a week". No one relishes that thought even for five minutes.

Above all I stress the need for the immune system and its regulatory role in the body. Not the constant vain attempt to sanitise a septic mouth where the physical chewing system has failed.

Artificial teeth cleaning is discussed. Clients readily relate to the difficulties they experience finding the time or mastering the technique. They are then invited to imagine a cooperative family member needing a teeth clean and finally the family pet. Laughter usually follows.

We do acknowledge the exceptions. Canine teeth may benefit from brushing since the killing and dismembering function seldom occurs in domestication. Brushing may be the only option in some brachycephalic animals, those with missing teeth and those unaccustomed to bones.

Common Things Are Common

Puppy and Kitten First Vaccinations

The emphasis is placed squarely on prevention to ensure a lifetime of health. Mention is made that the animals are particularly vulnerable to gum disease at teething. Owners are encouraged to smell the breath of their new pet. Frequently it stinks at six weeks of age.

Chicken necks and wings are the recommended food together with whole, raw fish. It is mentioned that fish can be associated with hypo-vitaminosis B1 but never seen by us. That in truth chicken is too large a bird for kittens and that smashing the wing with a mallet helps.

We recommend that the whole wing be put through the mincer for young kittens and pups.

Clients usually exclaim that "I thought that chicken bones were harmful". We explain the persistent myth dating from when chicken was a delicacy and the only available bones were cooked. How, in fact, ground-nesting birds are virtually a free meal for wandering carnivores. They do not even need to give chase.

Second and Third Vaccinations

All the preceding material is reiterated. Clients usually report on the success of the venture although some slip back into old habits. If pups or kittens have been processed food fed, there is frequently visible calculus build-up. We show clients how to hold the forelegs of the pet, pressing the body between their forearms. It is then an easy matter to scrape off the supra-gingival

calculus. We acknowledge to the client that this is an imperfect job but not to worry. The emphasis is placed on on-going management. That chewing the bones removes the vestiges of supra-gingival calculus but more importantly scrubs the subgingival plaque.

De-sex at Six Months of Age

The mouths of surgical patients are often putrid. During teething and in the absence of bones, a stagnant mess prevails. We advise accordingly.

Cats with Moderate Calculus Presenting for any Problem

Naturally the presenting problem is diagnosed and treated. Cats usually submit to scaling. They are suitably overwhelmed by the surroundings. Dietary changes are initiated and the client asked to return in one to two months for reassessment.

Dogs with Moderate Calculus Presenting for any Problem

It is mentioned that the "silent disease" is frequently only fully assessed by examination under anaesthesia. If the animal needs an anaesthetic for the presenting complaint then dentistry is offered at a further charge.

If anaesthesia is not required then dietary changes are recommended and a return inspection recommended in one to two months.

Cats and Dogs Presenting for any Problem with Concurrent Moderate to Severe Periodontitis

The inter-relationship of all disease processes is stressed. A treatment protocol is devised including dentistry under anaesthesia. The owner is advised that pain relief and restoration of function should be our guiding principles. Consequently we shall likely remove a number of teeth. From the outset we advise that the patient has probably become addicted to harmful foodstuffs not unlike the nicotine, alcohol or heroin dependent person. Changing the dietary habits may prove difficult and that they may prefer to board the animal with ourselves until dietary change is effected.

Blood tests prove a useful adjunct in the treatment of these patients. A baseline of values is established and can be compared with results at follow-up in a couple of months time. The research benefit of having lab results is considerable both for in-house demonstration to clients and also for contributions to professional journals. Blood tests are always read against 'normal' values. We do not know the source of these values but suspect they have been obtained from colonies of research animals. Research colonies are usually processed food fed, and therefore suffer periodontal disease. There can be noticeable blood changes in animals suffering periodontal disease thus rendering the so-called "normals" invalid.

Periodontal disease diagnosis and treatment is discussed elsewhere. Measurement of pocket depth is notoriously

unreliable as a means of assessing the severity of the problem. Cats in particular often show little or no pocketing. The tell-tale sign for us is the bulging gums over the roots of the canines. If these teeth are squeezed together between thumb and forefinger a characteristic pain response is elicited. Removal of these teeth is usually easy and produces a tooth with severe apical resorption. Subsequent attitude/behaviour changes confirm that we have done the patient a huge favour.

When extractions have occurred it is stressed that the normal scissor action is lost and accordingly remaining teeth will lack appropriate massage. Toothbrushing may be necessary to prevent the disease progressing. Immediate follow-up appointments are arranged. A six-month recall reminder is inserted in the record system in order to keep the patient under constant review.

Following dental surgery we frequently advise raw meaty bones and water only for the first week. Contrary to expectation pain does not seem to be a problem for our patients. Rather they appear more content without the periodontal disease affected teeth and tear into their first postoperative meal with gusto. By keeping dental patients in hospital for a couple of days you will gain experience and thereby confidence.

Special Groups - Persian Cats, Pugs, Pekingese and Chihuahuas

These breeds are predisposed to dental disease due to malocclusion, mouth breathing and the propensity of owners to treat them differently. We stress that they have the physiology of the carnivore with an increased need for preventative dental hygiene. These animals do just fine on raw chicken necks, rabbits and whole fish.

Bulldogs

I heard of one bulldog that could not breathe and chew a bone simultaneously. Our experience is that chicken carcasses, carrots and apples are handled easily.

Boarding Animals

We board a few "healthy" animals. In every instance we know that gum disease will be underway unless the owners have had exposure to the new ideas. It is always a delicate business recommending dental care to these owners. They frequently deny a problem exists and suspect our motives. Usually the bad smell coupled with the written material serves to convince them.

Cautionary Tales

Murphy's law prevails and not unexpectedly any system in use can experience setbacks and deviations from the norm. The moral here is not be complacent but be eternally vigilant and on the look out for the unexpected. Do take care not to translate valid concerns into rash action. To risk a cliché - "do not throw out the baby with the bathwater".

Early in my career I was lucky enough to attend the animals in the local safari park. At any one time there were twenty to thirty lions and perhaps a dozen tigers. One day each week the animals were fasted and frequently vomited on that day. Most days the food consisted of half a cow's head. One tigress vomited mucous for a couple of days and went off her food. A presumptive diagnosis of small intestinal impaction with bone was subsequently confirmed at surgery. Her recovery was complete. After a first meal of whole rabbit her usual diet was reinstated. The owners were certainly not agitating for a change to mushy canned food.

Recently a ten-week old Rough Collie puppie was presented with rectal impaction of chicken vertebrae. The puppy belongs to two friends who own 22 adult and 26 Rough collie pups. Despite this incident they are both delighted with their new natural feeding regime. The cost saving of \$150 per week is a factor but otherwise "feeding time is halved", "my dog's adored the diet from day one", "we are spreading the word".

The comments I would make are that:

- a) Bolting chicken necks without proper mastication before a litter mate gains advantage could be a factor. Lamb flaps could be a better proposition for this particular litter.
- b) Some animals may have a problem with bone digestion just as some human babies cannot digest breast milk.
- c) The inability may be genetic in origin. If generations have been fed exclusively on mushy food it will be quite possible for a defective gene to persist to the present.
- d) Penetrating the fable of the tiger and the collie dog may bring us into contact with a fundamental fact of evolutionary biology. That carnivores are highly specialised animals which, if conditions are right, will thrive. Small perturbations at the margins bringing about dramatic outcomes eg tiger with bowel impaction. Domestic dogs are derived from specialist feeders and are further specialised. Tantamount to making modifications to a Ferrari. In the case of the collie breed, it is known that Collie Eye Anomaly and Blood Brain Barrier/Ivermectin toxicity problems exist.

Possibly the breed modification predisposes to digestive upset such that even minor perturbations of little consequence to the parent species will have a major impact on the modified genotype.

"Specialised organisms thrive when conditions are optimum but experience considerable pressure to adapt or perish when the conditions change. Relatively undifferentiated organisms can accommodate change with relative ease."

Adaptation of C Darwin

This proposition needs testing. It will be a most alarming indictment if we have so modified dogs that they are condemned to acute bone impaction if they consume natural food or condemned to chronic periodontal disease if they do not.

It is well known that dogs jealously guard bones and will engage in savage fights to protect them. This natural behaviour can alarm owners as can the habit of burying bones surplus to need. Do not be deterred. Dogs can be separated at feeding times and bones just sufficient for need can be supplied.

When one client was pressed for complaints about bone feeding she mentioned that she would be more readily convinced if we published the constituent parts. My answer was that fresh human food, meat, bread, vegetables etc do not carry lists of ingredients. It is only packages of processed foods that display a list of contents. As we all know a table of contents does not guarantee suitability for purpose.

Sparring with clients is counterproductive and, appealing to intellect is frequently unrewarding. The current level of cultural conditioning is such that it may take years before sanity returns. One firm resolution arising out of this encounter was the need for a good colour histological diagram of bones. Clients think of bone as solid inert material instead of the intricate organic and inorganic structure.

Periodontal Disease Consequences

The objective problem here is whether all disease states can be traced to the diseased mouth. Lacking a control group of naturally-fed animals, which at no stage have suffered periodontal disease, we have an intellectual problem. Put another way, all animals presenting with a disease either have, or have had, significant periodontal disease during their history.

It is axiomatic that correlation does not imply causation. There is, however, sufficient evidence from Chaos theory (about interconnectivity) through to a knowledge of immune pathways to suggest that periodontal disease plays a significant/dominant role. (As a digression, let me say, that causation is a vexatious concept plagued with as many problems as it solves. It needs to be used sparingly and with caution).

From a practical stand point we find making the assumption that periodontal disease is an integral part of all disease processes provides us with a powerful, predictive and explanatory tool.

Bacteraemias and Viraemias

An inflamed mouth presents a widened portal of entry to the capillaries and lymphatics. By contrast, intact mucosae and skin is impenetrable to most organisms.

Hyper-immune Conditions

We have case histories of eosinophilic granuloma and plasma cell pododermatitis responding to dentistry and diet change. This supports the view that hyperimmune

conditions develop due to the over reactivity of the system when seeking to sanitise a foul mouth.

Autoimmune Conditions

It is well known that over reactivity can lead to autoimmune conditions. It is interesting to note that the periodontal ligament is collagenous. That the pododermatitis of cats affects the highly collagenous digital pads. All ruptured cruciate cases treated by us have a foul mouth.

Hypo-immune Conditions

We have an extensive line of cases demonstrating leucopaenia. These animals, once the periodontal disease is brought under control and commenced on a raw bone diet, gain:

- a) an increase in health status and
- b) an increase in leucocyte count.

This is a ready and objective test that you can conduct yourself. (Depending on the stage of the disease you may see an inflammatory profile or no change at all).

Multicomponent Immune Disease

In our population of aging pets nothing is ever tightly defined as a single problem. It is common to see flaccid, elderly animals with foul mouth and heart, kidney, joint, skin and cancerous conditions attributable to the preceding four immunological disasters. We used to depend on antibiotics to kill bacteria and corticosteroids to suppress the immune response. Now we clean up the mouth and change the diet.

Treatment Failures

Some cases of plasmocytic-lymphocytic, stomatitis of cats have not responded to dental care and diet change. This has been disappointing considering the rapid improvement of the eosinophilic granuloma and plasma cell pododermatitis cases. One long-standing case is "stable" on a raw, rabbit-leg diet with periodic prednisolone therapy.

Of course we are aware that once immune disease is underway the simple removal of the excitatory cause will not necessarily bring about cessation of the disease process.

As we increase the numbers of cats reared and maintained on a natural food diet we gain an opportunity to observe if the plasmocytic - lymphocytic stomatitis will arise spontaneously. Little doubt exists in my mind but the statisticians will require numbers.

Things to Avoid

Avoid losing focus on the goal you have established. Along the way some will induce you to recommend feeding bones once or twice weekly instead of every day. Do not feel compelled as if you need to prove your reasonableness and willingness to compromise. Just remember that the enemy never rests.

"Microbial plaque is a structural, resilient, yellow-greyish substance that adheres tenaciously to teeth. It is comprised of bacteria in a matrix of salivary

glycoproteins and extra-cellular polysaccharides like glucans (eg dextrans, mutans) and fructans (eg levan). This matrix makes it impossible to rinse plaque away with water; it must be removed mechanically....Plaque is not a food residue. Supra-gingival plaque forms more rapidly during sleep when no food is ingested than following meals. The consistency of diet also affects the rate of plaque formation and pathology is increased in soft diets." M Tholen 1987.

Do not invest heavily in a dental work station to achieve shiny white ivories on one occasion each six months. Keep the focus on daily chewing and spend the money on a freezer instead.

"Manual removal of calculus was not required when dogs were fed one-half or one whole oxtail per week." Brown et al 1968.

By the time you have read this far you will be aware that selling processed pet food is taboo. This includes the so-called prescription diets which simply retain the physical form but alter the chemical formula.

By now you will be thinking pro-actively and with prevention uppermost in your mind. Make long-term estimations for your pharmaceutical needs and ultimately your cash flow.

This paper was written with practitioners in mind. The legal ramifications are a recurring concern for anyone in business. My NSW-based solicitor was asked for an opinion and he advised that the following matters may become issues of relevance in the future.

1. Potential claims by pet owners under various pieces of consumer legislation throughout the States and Territories of Australia.
2. In the federal sphere potential Trade Practices Act claims for false or misleading claims may be made either in relation to advertising or promotional material labels.
3. The new Truth in Labelling activities instituted by the Federal Government.
4. Potential problems or claims under the recently introduced Product Liability provisions in Part V of the Trade Practices Act.
5. The, as yet, unknown effect of class actions which have been lawful in Australia since the 5th day of March 1992 which may tend to overcome the existing drawbacks to actions brought by individual pet owners, namely the high cost of litigation and claims which may amount to only several hundreds of dollars in relation to an individual pet.

The foregoing relates to potential claims against manufacturers, distributors and possibly even retailers of processed pet food. Query what may be the legal problems of veterinarians who fail to consider the issues raised in this paper or fail to address those issues in advising pet owners who make known to the veterinarian

that they rely wholly and solely on processed pet food to supply their pets' diet. Is it too much to suggest that, as pet owners, in common with everyone else in the community, become more litigious veterinarians may some day share top billing on a Writ?

Epilogue

Since Lister (1827-1912) antiseptics, Pastuer (1822-1895) discovery of microbes and Fleming (1881-1955) discovery of penicillin we have been obsessed with microbes and conquering them with "magic bullets". Despite the evident successes there seemed to be evermore requirement for magic bullets and practitioners to fire the shots.

A number of veterinarians and most clients find the old chauvinist approach has lost its appeal. Although hard to specify why. How much better this new found holism providing comfort and harmony?

For me each day is greeted with eager anticipation; as an opportunity to spread the message. Fast tracking to redundancy may seem a trifle odd, nevertheless I cheerfully predict that you will enjoy it too.

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