

pureANIMAL

Clinical education for natural pet health



Dr Kelly Halls
on fresh food
feeding



SUCCESSFUL
treatment of obesity

PLUS

An interview with
Dr Alex German

News, education
and events



THE PET OBESITY

EPIDEMIC

Preventing and managing this complex problem

THE ELEPHANT IN THE ROOM



This volume of *pureANIMAL* places canine obesity squarely under the spotlight. With an overwhelming 41% of dogs in an Australian study considered overweight or obese, perhaps you, like me, have been tempted to let it slide in consult, since it is rarely the presenting complaint and a quick way to sabotage rapport building with clients.

Our **Cover Story** highlights the pathologies which afflict our obese patients and the risk factors that make them so. It's no spoiler to tell you that while obesity is tricky to cure, but the **Treatment** is a good place to better understand why the weight is so hard to lose, with ideas to help our patients succeed.

Dr Kelly Halls shares an integrative view where fresh food is the medicine when it comes to weight loss in our obese patients and may be key to prevention in our **Analysis and Opinion**. For more on Dr Halls' integrative approach to practice, *pureANIMAL* Podcast has your fix, along with other integrative pearls from a host of practitioners for your listening pleasure.

Professor Alexander German of the University of Liverpool shares his extensive experience on the complex problem of pet obesity, and how vets can participate in prevention of obesity and reducing stigma in our **Interview**.

Looking to the ever-brighter future of the next generation of clinicians, our **Ingredient Focus** is a prizewinning entry prepared by veterinary student Maddison Selleck on Rockweed, and its potential not just as a dental supplement but probiotic and anti-inflammatory in companion animals.

Our **Research Update** as always showcases the best of recent scientific literature in complementary medicine. Curcumin and licorice for atopic patients, feline allergy in humans, the raw diet microbiome and yeast beta-glucan for obese dogs are all exciting moves forward in our field.

We hope you enjoy this issue of *pureANIMAL*, and feel inspired to start, or continue your conversations on companion animal obesity.

We hope you enjoy this issue of *pureANIMAL*.

Dr Felicia Tam | EDITOR

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Education and Events

Your guide to training and education in integrative veterinary medicine within Australia and overseas.



JULY 2022

What	Large Breed Puppy Nutrition - Fact Or Fiction
When	6 July @ 7pm AEST 2022
CPD	1
Where	https://www.ava.com.au/education-events

What	Small Animal Conference
When	24 July- 28 July 2022
CPD	TBA
Where	Darwin Convention Centre, Darwin

OCTOBER 2022

What	The VET Expo
When	26 October - 27 October 2022
CPD	TBA
Where	International Convention Centre, Sydney

NOVEMBER 2022

What	Chewing The Fat Over Pet Obesity
When	9 November @ 7pm AEST 2022
CPD	1
Where	https://www.ava.com.au/education-events

DECEMBER 2022

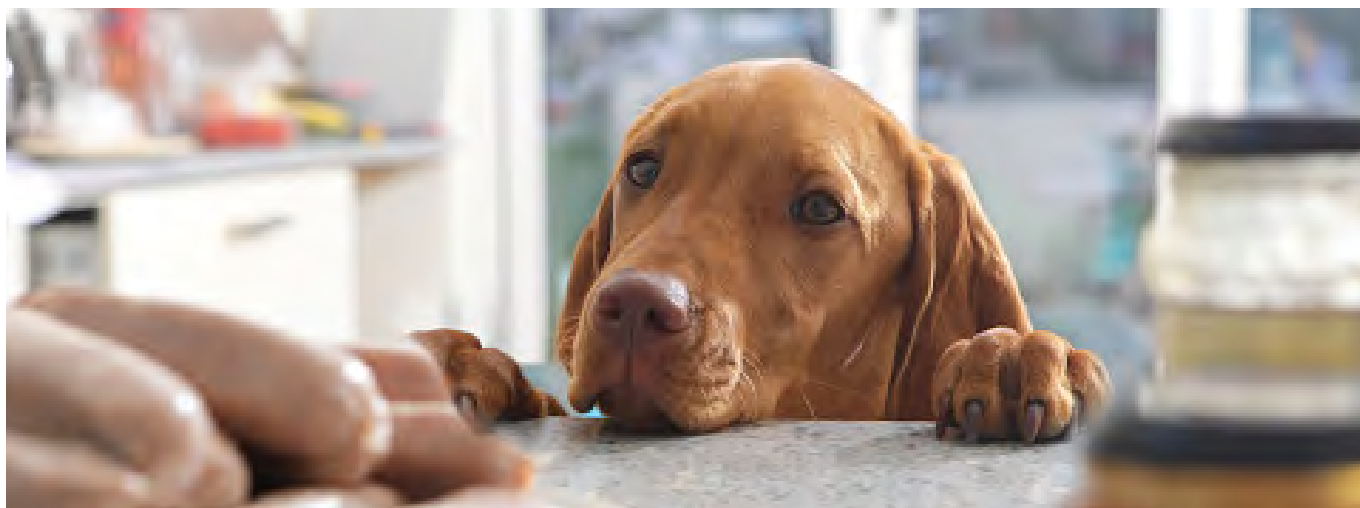
What	Keeping things moving: Mobility disorders and rehabilitation
When	7 December @ 7pm AEST 2022
CPD	1
Where	https://www.ava.com.au/education-events



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Epidemic in the Clinic

Obesity is the most common nutritional disorder in companion animals.¹ Akin to other chronic diseases, obesity is insidious in nature, with multiple predisposing factors contributing to its development and significant morbidity in affected dogs.²

There are calls for the profession to wake up and accept that companion animal obesity is one of the most important medical diseases in our patients. An Australian study of over 2500 dogs from both urban and rural settings found 33.5% of dogs were considered overweight and 7.6% obese, with incidence in cats thought to be similar.^{1,2,3} In industrialised societies, more than one third of dogs and people currently qualify as obese and figures are expected to rise, with a 400% increase in the proportion of obese people in last 25 years, and almost two-thirds of adults in the United States considered overweight or obese.^{1,4,5}

Defined as an accumulation of excessive amounts of adipose tissue in the body, obesity is measured body composition analysis with an important conceptual division between fat mass and lean body mass.¹ In humans, established criteria for definitions of overweight and obese are based on BMI.¹ In companion animal practice, nine-point body condition scoring is most widely accepted, with veterinarians assessing body outline, fat coverage and ability to palpate the ribs.^{1,6} While a feline BMI has been developed, the many breeds of dog make an equivalent measurement challenging and hence, currently cats and dogs are classified as overweight when bodyweight is >15% above optimal body weight and obese when >30% of optimal.^{1,7}

The Metabolic and Mechanical

A subset of comorbidities seen in obese companion animals are related to the metabolic activity of white adipose tissue, which actively secretes hormones, cytokines and other cell-signalling substances called adipokines.^{8,9} Altered adipokine secretion appears to be an important mechanism for the link between excess bodyweight and many diseases.⁹ Adipose tissue in obese individuals is characterised by an increased population of activated macrophages, which further contribute to inflammation and cytokine release.⁹ The adipokine adiponectin enhances insulin sensitivity and stimulates basal energy expenditure, but decreases with increasing adiposity and insulin resistance in most species.⁹ In cats, insulin sensitivity decreases by about 30% for each kilogram of bodyweight gained.⁹

Production of inflammatory cytokines and acute phase proteins combined with tissue hypoxia during obesity also results in chronic, systemic, low-grade inflammation.¹⁰ Chronic inflammation can lead to increased cell proliferation, inhibition of apoptosis and induction of angiogenesis, thought to be one of the biological mechanisms linking obesity with higher risk of various types of cancer, though this link has not been shown to be as strong in veterinary patients as in humans.⁸ Other hormonal diseases with a reported association with obesity whether as a predisposition

or occurring more commonly in obese animals include hypothyroidism, hyperadrenocorticism and insulinoma.¹

Mechanically, obesity is associated with orthopaedic, cardiorespiratory and urogenital comorbidities.¹ Several studies highlight the association between obesity and development of osteoarthritis, with substantial improvement in degree of lameness seen after weight reduction in dogs with hip osteoarthritis.¹ Obesity is a risk factor for development of tracheal collapse in small dogs, and can exacerbate heatstroke and other respiratory diseases such as laryngeal paralysis and brachycephalic airway obstruction syndrome.¹ An association between some cases of urethral sphincter mechanism incompetence and obesity has been recognised, with increased retroperitoneal fat caudally displacing the bladder thought to be responsible.¹ Risk of dystocia is increased in obesity likely due to increased adipose tissue in and around the birth canal.¹

The impact of obesity on clinical evaluation of patients is significant, affecting components of the physical exam such as thoracic auscultation, palpation of the abdomen and peripheral lymph nodes, as well as complicating procedures such as blood sampling, cystocentesis and diagnostic imaging.¹ Surgically, anaesthetic risk is increased with challenges estimating anaesthetic drug doses, catheter placement and longer operating times.¹

Is It Nature or Nurture?

A significant disposition to obesity exists in breeds including West Highland White Terriers, Cavalier King Charles Spaniels, Dachshunds, Beagles, Cocker Spaniels, and Labradors.⁷ Changes in sex hormones after gonadectomy affect the satiety centre in the brain, through alterations in leptin and ghrelin concentrations.⁷ A combination of decreased energy requirements and increase in food consumption increases obesity risk after neutering.⁸ Interestingly the age of neutering does not impact the risk of dogs becoming overweight, and neutering only increases risk relative to intact dogs for the first two years after gonadectomy.¹¹ A clear increase in prevalence of being overweight or obese with increasing age is seen, with middle age in dogs and cats seen as a risk factor, with females overrepresented.^{3,1} The reduced metabolic rate due to declining lean body mass associated with aging predisposes dogs to being overweight or obese.⁷

Perhaps unsurprisingly, owner specific factors, such as age, income and amount of exercise they can give their dog are more influential than dog level factors, such as breed, age or neuter status.⁵ An Australian study found dogs from rural or semirural areas were at greater risk of being overweight or obese than urban dogs, with one potential explanation that rural/semirural dogs may be receiving less

structured exercise.³ As with humans, lack of exercise not only predisposes to higher levels of obesity in dogs and cats but also exacerbates health problems linked to being overweight.¹⁰



Ultimately for obesity to occur, a positive mismatch between energy intake and expenditure is required, and obesity has been associated with the number of meals, snacks, kitchen scraps and treats fed to dogs.¹⁸ The use of food as an acceptable means of communication and a tendency to over-humanise and indulge pets is seen in owners of overweight cats and dogs.¹⁰

Given the control that owners have over the management of dogs, it is not surprising that human socioeconomic and lifestyle factors play a major role.¹² Typical owners of at-risk dogs are typically overweight themselves, on lower incomes, older, relatively inactive and spend much more time in the company of their pets.⁴ Current perspectives on this topic target the individual, without considering political, social and related human issues that underlie the problem.¹⁰ Social and structural determinants such as owner income, working hours, diets and exercise patterns are known to influence the risk of excess weight in pet dogs, but these, along with the impact of demographic changes such as more single-person households, urbanisation, apartment living, longer working hours, increased participation of women in the paid labour force and sedentary pastimes of owners tend to be under-recognised in their contribution at a population level.⁴

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The Rockweed Remedy

Ascophyllum nodosum possesses many potential applications in veterinary medicine.

Dental treatment is a staple of the veterinary consult and advising owners on appropriate home care is key to prophylaxis. Actively brushing the teeth is the most effective way to keep them free of plaque.¹ However, the difficulty and time required for brushing reduces owner compliance.^{1,2} Passive methods, such as treats and dental kibble, have better compliance but their ability to mechanically remove plaque can be limited by product structure, palatability, and the pet's eating habits.¹

The above dental home care can be improved by the inclusion of *Ascophyllum nodosum* in the diet or in dental products. *A. nodosum*, commonly known as rockweed, is a brown, marine seaweed that grows in cold waters.^{3,4} In recent years it has emerged as an indirect method for plaque control and, as more research is done, its range of applications is becoming even broader.⁴

SUPER SEAWEED

Rockweed helps prevent calculus formation by changing the composition of saliva and gingival crevicular fluid (GCF).⁵ Digestion of *A. nodosum* leads to absorption of monosaccharides, short chain fatty acids (SCFAs), and peptides. These compounds cross the capillary walls in the salivary glands and periodontal crevice, especially when hydrostatic pressure is increased as is the case with gingivitis.⁶ Here the compounds can be secreted in saliva and GCF respectively and the rigid, anionic sections on the peptides compete with normal salivary acidic proteins for calcium ions.⁵ Complexing the calcium reduces the ions available for precipitation as calcium carbonate and calcium phosphate, the two main components of canine calculus.⁷ This can prevent the development of future calculus and allow existing plaque to break down and become easier to remove.⁵



Madison Selleck is a fourth-year veterinary student from Murdoch University. Wanting to be a vet since age five, Madison is excited to perform surgery and execute modern approaches to patient care when she graduates..

A. nodosum helps with other aspects of dental disease besides plaque. Gingivitis (often induced by pre-existing calculus) supports the colonisation of the oral microbiome by anaerobic bacteria. These bacteria produce volatile sulfur compounds, the source of halitosis from dental disease.⁸ Rockweed has a high omega 3 to omega 6 ratio and contains several anti-inflammatory compounds (e.g. alginic acid, fucoidan) which mitigate the gingivitis.⁹ This can reduce halitosis and slow bacterial growth to decrease the risk of developing infection and periodontitis.

PREBIOTIC POWDER

A. nodosum is unique in that it has the highest content of polysaccharides by dry weight out of all the brown seaweeds.¹⁰ These polysaccharides include phycocolloids such as alginates, fucoidans, laminarin, and mannitol, which cannot be digested by dogs and cats. Instead they are used as an energy source for good bacteria and thus have a prebiotic effect.^{3,4,10} Laminarins in *A. nodosum* also have positive effects on mucus structure, help maintain intestinal pH, and improve SCFA production. This helps with the regulation of intestinal metabolism and consequently decreases the ability of enteroinvasive bacteria to adhere to and cross the epithelial wall.¹¹ These mechanisms help prevent dysbiosis as demonstrated by the reduced *E. coli* shedding in cattle which receive *A. nodosum* supplementation.¹²

IMMUNOLOGICAL INCLINATIONS

Another beneficial polysaccharide is ascophyllan. It enhances dendritic cell maturation which can improve an animal's response against infectious diseases and neoplasia.¹³ It also stimulates the secretion of TNF- α by macrophages and increase the activity of natural killer cells against some lymphoma types.¹³ Additionally, the polyphenols and phlorotannins found in brown seaweeds decrease cancer risk by acting as free radical scavengers and cell cycle regulators. The immunomodulatory effects of ascophyllan are also supported by fucoidan which has anti-tumour, anti-oxidant and antiviral properties¹⁰

A NUTRITIONAL POWERHOUSE

A. nodosum is also nutritionally beneficial. It has lower protein levels than red and green seaweeds but often still has more essential amino acids than commonly used grains (including soy). It has a low lipid content but still has good levels of essential fatty acids. It is a good source of vitamin C, vitamin E, and the B group vitamins (especially thiamine and

riboflavin). As a result of bioaccumulation, rockweed contains high levels of minerals, including sodium, potassium, calcium, magnesium, iron, zinc, manganese, copper, and iodine. However, it is this bioaccumulation, which can contribute to heavy metals in wild seaweed. This, as well as differences between seasons and harvesting methods, can lead to variable nutritional values. Therefore, farmed options should be considered when selecting a source of rockweed.¹⁰

KELP FOR KELPIES?

A. nodosum's most obvious clinical use is as a dental treatment. It can be given as a chew, dental kibble, or powdered supplement with no apparent effects on palatability.¹⁴ Combining rockweed with other treatments, such as dental sealants can improve their efficacy and prolong the periods between dental scale and polish procedures.¹⁵

In addition to reducing gingivitis, rockweed's anti-inflammatory properties can be used alongside anti-inflammatory drugs, such as prednisolone, to limit the dosage required. This can help decrease the side effects that an animal may experience when on long term treatment or when suffering from comorbidities.⁹

The pre-biotic capabilities of *A. nodosum* mean that it can be used to reduce and replace antibiotic administration. This has been carried out on pig farms with improvements in the *Lactobacillus* to *E. coli* ratio and better resilience to intestinal disease.¹⁶ Reduction can be important for mitigating the side effects of antibiotics while replacement can decrease the risk of developing antibiotic resistance. Combining *A. nodosum* with probiotics for a symbiotic approach can replace antibiotic use in cases of mild disease. This can decrease the frequency with which antibiotics are used which is important for antimicrobial stewardship and emerging antibiotic resistance.

One thing to keep in mind when feeding *A. nodosum* is the iodine content. Iodine levels in wild rockweed are particularly high which makes supplementation a potential treatment of iodine deficiency.¹⁷ However this does also mean that dosage recommendations should not be exceeded to prevent toxicity.

The Rockweed Remedy is the prizewinning entry for the Blackmores Animal Health Veterinary Student Competition encouraging the next generation of vets utilising natural therapies as a part of their practice.

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A Losing Battle

If only it were as simple as nutrition.

Treatment of a nutritional disorder of positive energy balance from excessive dietary intake and or inadequate energy utilisation is achieved by targeting a negative energy balance.¹ Whilst appearing straightforward, real life weight loss is far more difficult and only a minority of obese pet dogs are successful at losing weight and maintaining weight loss.² An essential factor in the persistence of overweight/obese animal states is failure of owners to recognise excess weight in their pets, reflected in an Australian study where 41% of dogs were classified as overweight but only 25% of owners believed their pet was obese.^{3,4}

OWNER ON BOARD

The success of weight loss and avoiding rebound weight gain is dependent on changing owner behaviour, and supervised support is considered perhaps the single most important component of the weight loss strategy.^{2,5} This is labour intensive, requiring some degree of expertise and training in owner counselling and may require a dedicated member of staff.⁵ Discussions with owners could include estimating calorie needs, implementing portion control, moderating treats, critically evaluating pet food advertising, handling conflict with other caregivers and understanding the benefits of social support.⁶

Successful treatment of obesity has two main phases – weight loss and subsequent weight maintenance.⁷ In this, obesity resembles many other chronic diseases, where management is lifelong.² At present, the cornerstone of weight management in dogs and cats involves dietary therapy with increasing exercise and behavioural management comprising useful adjuncts.⁵

TARGETING NEGATIVE ENERGY

Determination of energy requirements begins with an estimation of ideal body weight. Body condition score can be helpful in approximating ideal weight, as every integer >5 on a 9-point scale equates to an animal being overweight by 10-15%.³ Breed, age and activity markedly influences energy requirement with maintenance energy requirements for dogs ranging from 94-250kcal metabolisable energy (ME) x kg bodyweight.³ A thorough diet history and assessment of activity will determine whether restriction is to be based on resting or maintenance energy requirement, with daily calories 60-70% of this value to achieve a safe rate of weight loss.³ Most weight loss diets are comparatively less energy dense, have increased amounts of good quality protein to preserve lean tissue mass in the face of restriction, and micronutrients to reduce the risk of nutrient deficiencies developing.^{5,7}

The median rate of weight loss is 1.2% body weight per week

in dogs and 0.8% body weight per week in cats in the first 28 days of a complete weight loss protocol.⁷ This rate slows significantly in both species to 0.3% per week in both species after 12 months.⁷ Treats in the diet can be a significant source of calories, so incorporating treats into a weight loss plan helps provide specific guidelines for owners, with treats recommended to represent 10% of total daily calories.³

DOG LIFESTAGE	MER (kcal ME/D)
Active Intact	130 (BW _{kg}) ^{0.75}
Active	110 (BW _{kg}) ^{0.75}
Neutered Inactive	100 (BW _{kg}) ^{0.75}
Neutered Obesity Prone	95 (BW _{kg}) ^{0.75}

CAT LIFESTAGE	MER (kcal ME/D)
Active Intact	100 (BW _{kg}) ^{0.67}
Active	90 (BW _{kg}) ^{0.67}
Neutered Inactive	75 (BW _{kg}) ^{0.67}
Neutered Obesity Prone	130 (BW _{kg}) ^{0.4}

Abbreviations: D. day; ME. metabolizable energy; BW_{kg} Body weight in kg; MER. maintenance energy requirement
 Figure 1. Maintenance energy requirements for dogs and cats based on lifestyle and activity status ³

FATS FOR FAT PETS

Dietary fat generally presents a challenge to any weight loss diet due to its high caloric density.³ However polyunsaturated fatty acids EPA and DHA may have some beneficial effects in the context of weight loss due to their ability to modulate lipid inflammatory mediators to counter adipokines and cytokines produced from adipose tissue in the obese state.³ Introduction of certain omega-3s result in production of inert prostanoids and leukotrienes that mitigate proinflammatory signals from arachidonic acid derived eicosanoids.³ Polyunsaturated fatty acids also appear to exert effects on adipocytes by decreasing adipokine production and inducing gene transcription.³ Omega-3 fatty acids are potent peroxisome proliferation activation receptor agonists (PPAR), and activation of PPAR gamma results in production of high molecular weight adiponectin, which appears to have the most potent insulin sensitising effects of all the forms found in the bloodstream.³

MOVING ON FROM OBESITY

Interactive exercise between dogs and owners enhances the human-animal bond and represents a cost-effective way to increase canine activity, promote health and optimise pet weight.⁸ A prospective, randomised, single-blinded study looking at veterinary prescribed physical activity found 30 minutes of daily activity has a positive impact on canine anthropometry (weight or BCS) in a relatively short time (3 months) observed at all activity levels.⁸ Increasing physical activity when used in combination with dietary therapy, promotes fat loss and may promote lean tissue preservation.⁵ Exercise strategies in dogs include lead walking, swimming, hydrotherapy and treadmills.⁵

TAILORED PLANS FOR PETS

While most obese dogs and cats are unsuccessful in reaching and maintaining their ideal weight, the majority will lose some weight in the early stages.⁷ Force plate analysis shows that mobility benefits begin very quickly during the weight

loss process, once >6% of body weight has been lost, which is achievable in 80% of dogs that commence a weight loss programme.⁷ Tailoring the weight loss program to the individual weight sets a realistic target weight, to maximise the benefit whilst at the same time minimising the chance of failure.⁷

Targeting complete weight loss, where the goal is to return the animal to its ideal weight, provides maximal health benefits and is most beneficial for young dogs, where effects on organ function will have been short-lived and associated diseases are unlikely to have developed.⁷ Partial weight loss involves setting a target weight above an animal's ideal weight with the aim of achieving enough weight loss that quality of life is improved.⁷ These programmes can be relatively quick (2-3 months) and most animals are likely to succeed, and the option exists to then set a lower target.⁷ This strategy is mainly for older animals or those who already have pre-existing diseases.⁷

THE BIGGER PICTURE

As the root causes of obesity and health in human populations are genetic factors, diet, levels of physical activity and how an individual's behaviour on these dimensions is mediated by their social and economic circumstances, structural components outside of owner control (lack of time/space to exercise, animal bylaws and perception of neighbourhood safety) play a part in the causal problem of dogs becoming obese and remaining that way.^{9,10} Veterinarians can engage with drivers of population-level incidence whether via preventative and public health programmes for animals and people, or as public educators in promoting structural interventions.¹⁰ Interventions on a population level include dog walking clubs, telecommuting, improved lighting in streets and parks to make it easier for people to walk dogs in the evening, preferred zoning near workplaces for dog day-care programs and allowing dogs on public transit.¹¹ The veterinary healthcare team can continue to prioritise preserving beneficial healthy human-animal relationships, by understanding the strong human-animal bond between owners and pets, fostering healthy behaviours already present and creating healthy substitutes for behaviours that predispose both people and their pets to obesity.⁶



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An Expert Weighs In

There are crucial ways the veterinary profession can be participating in treating and preventing obesity in our companion animal patients. Professor Alexander German, who has run the world's first specialist weight management clinic for cats and dogs at the University of Liverpool since 2005, provides insights from his experience.

What drew you to the area of canine obesity?

Prior to moving to my current position at the University of Liverpool in September 2002, twenty years ago, I'd been involved in gastroenterology research. At Liverpool, I met a professor of adipose tissue biology named Paul Trayhurn, began doing some research on adipose tissue in companion animals, and from there a clinical interest grew into the specialist obesity clinic which has now been running since 2005.

Why does canine obesity get less attention compared to other veterinary conditions?

The starting point is that we don't talk about canine obesity in any great detail as a disease or a problem. Both in the medical and veterinary profession, we still struggle to see it as a medical problem rather than effectively a problem of behaviour and lifestyle. Obesity in humans and pets is also a highly stigmatised condition, with a lot of blame associated whether to the individual or pet parent, making the topic tricky to handle. Treating obesity doesn't have a quick fix, it takes a long time, is diet based, involves a lot of counselling and involves a lot of failure so it isn't necessarily something that vets often like to sign up for. There is also a lack of great teaching on the subject in vet schools on how to manage it, which is often true of nutrition in general.

At your specialist veterinary weight loss clinic and in your experience, what are some ways clinicians can broach the subject of canine obesity while keeping clients onside?

At the specialist weight loss clinic, I have a full-time

veterinary nurse/veterinary technician who works alongside me. She is responsible for a lot of the client counselling which is a big aspect of what we do. We probably see clients who are already on board as they have come to us, and we have a lot more time compared to primary accession practice. Even so, we see a lot of failure, with about half our patients who are signed up reaching their target weight. From reflecting on our own successes and failures, speaking with other practitioners and seeing how our counterparts in human medicine address it, we have a few ways that we like to approach the topic, and a lot of it has parallels to how paediatricians work when speaking with parents about children with obesity.

The first thing is being careful about the terminology. While we shouldn't be afraid to use the term canine obesity for the disease, the words obesity and fat can feel like toxic terms, so I prefer to avoid those toxic terms and not necessarily talk about the problem itself but ease into the topic. One of the ways that can be helpful is having a body condition score chart in the room and talking about the 'shape' of the dog. Owners can look at the chart and perhaps even assess their own dog's shape according to the chart. Discussing changes in weight is another approach that doesn't require the use of the toxic terms. What is crucial is being empathetic and gentle - to emphasise an appreciation of the pet's personality and show that we care so they are assured we have the dog's interests at heart, while not diminishing the fact that is something that needs to be addressed.

Avoiding blame is absolutely critical. Studies show vets typically think the problem is a simple matter of overfeeding



Professor Alexander German BVSc(Hons), PhD, CertSAM, DipECVIM-CA, MRCVS RCVS Specialist in Small Animal Medicine (Internal Medicine) and EBVS European Specialist in Small Animal (Internal Medicine) has clinical and research interests in comparative obesity biology, preventing chronic disease and evidence-based veterinary medicine. He is on the Executive Board of the Association for Pet Obesity Prevention and has run the Royal Canin Weight Management Clinic at the University of Liverpool for 17 years, with a focus on improving quality of life of all overweight pets through clinical excellence, research and education.

Both in the medical and veterinary profession, we still struggle to see it as a medical problem rather than effectively a problem of behaviour and lifestyle

and lack of exercise, both of which are the owner's fault, whether it is said explicitly or not. This mentality results in vets making different recommendations because they automatically assume that the owners of pets in overweight condition are not likely to comply anyway. It is important to treat all owners the same, avoid blame and recognise it's a complex disease.

Something that comes from the human side is a recommendation to ask permission to talk about the problem. It would look like this, breaking the ice by discussing body condition/weight change, and then asking 'would you be comfortable having a conversation about this?'. Most people will say yes, and allow you to mention some of the things that can help, but if they don't, then it is something for discussion potentially in the future when they are a bit more open.

What can clinicians be doing to prevent canine obesity?

As a profession, we should be spending more time on prevention than management, particularly since obesity is a disease that cannot be cured but only managed, and unfortunately there is a high chance that your patients will rebound. Prevention is key, for pets of the future, rather than pets that already have obesity. As puppies and kittens there are programs that can be implemented to try and prevent obesity. Being proactive about monitoring body weight is the fundamental step that would help the most.

Prevention strategies should target breeds that are at particular risk, pets at neutering, pets in families with other obese pets or obese owners, since all of these things potentially contribute. Pattern of growth has been found to be a predictor of obesity, and so we have developed growth charts by following large populations of healthy dogs at ideal weight for the first 3 years of life, for dogs up to 40kg which can be found here www.waltham.com/resources/puppy-growth-charts. These charts have been developed mathematically the same way as the World Health Organisation charts for children, with charts for cats and giant dogs are still in development. The key is regular weight measurement and monitoring the trajectory of the growth, ideally monthly up to six months and then three monthly. Once the pet reaches adult weight, the healthy adult weight can be set in the records and checked regularly thereafter. As for children, there is no right or wrong percentile but we can use deviation from their percentile line as a trigger for action. A deviation of 5% flags the need for some intervention, and is more sensitive than using body condition score, which varies between clinicians and it takes 10% difference for the score to change.



Looking at the bigger picture, what are some of the ways veterinarians can help change the prevailing attitudes and determinants that surround human and canine obesity?

Change happens very slowly particularly when dealing with prejudice, bias and stigma, and will take generations to change, since it is ingrained without a sensible basis. There is some suggestion that while explicit weight bias is decreasing, implicit weight bias is not, and maybe even worsening in

Being proactive about monitoring body weight is the fundamental step that would help the most

the human field. Individuals who want to investigate this further might want to appraise their own behaviours by visiting the website <https://implicit.harvard.edu/implicit/australia/takeatest.html>, which has tests that can be taken to identify which prejudices you have. Taking the test doesn't solve the problem but makes you aware of it, which provides the impetus to assess your own behaviour in those situations.

The business of formally classifying obesity as a disease in the veterinary profession is something we are working on. There are some parts of the world where this has been more challenging than others, and pushback often is based on concern that it removes responsibility from the owner. However in the human field it appears that if you consider obesity as a disease, you're less likely to stigmatise people, which would help us all, as I think the stigma is one of the big things that stops us from acting.

Feeding Fresh for Portly Pets

The challenges of achieving weight loss in obese pets may be tied to the feeding approach. Dr Kelly Halls shares an integrative perspective on feeding for animal wellness.

As obesity levels in people continue to rise, stress on our health care system is building as overweight people develop more chronic diseases. There is now a mass of literature supporting the fact that diet and lifestyle are the biggest factors in the human pandemics of endocrine and obesity related chronic illnesses. The well-studied links between obesity and chronic disease in humans is being mirrored in our pet populations as well, with companion animal veterinary practices being overrun by patients with early onset chronic diseases - degenerative joint disease, endocrine diseases and cancers, resulting in shortened life spans and less healthy pets as they age.

ANOTHER LOOK AT THE DOG'S DINNER

As the literature now so squarely focuses on diet and lifestyle in the management of the human obesity problem, so too should our veterinary focus. It is agreed that dogs and cats have both evolved as carnivorous animals, and cats have held firmly to their obligate carnivore label - rejecting the adaptation to a plant-based diet through their skill

An integrative practitioner's approach to weight loss is to ensure the dog is being offered a full range of nutritional oils and fats, multiple choices of protein and a rich variety of plant-based nutrients and fibres, high in antioxidants and phytonutrients

and aptitude as top end hunters. Domestic dogs are more omnivorous, co-habiting and evolving with humans many years ago, and adapted to the human diet by scavenging leftovers from camps as well as hunting for prey.

When a "natural dog diet" is discussed in the literature, there is debate on how this is defined. Is it the prey-model raw approach of 80% meat, 10% bone and 10% organ, the freedom of choice studies showing preferred diet

compositions of pet dogs to be 45% protein, 45% fat and 10% carbohydrate, or are AAFCO and NRC recommendations of nutrient minimums most appropriate?

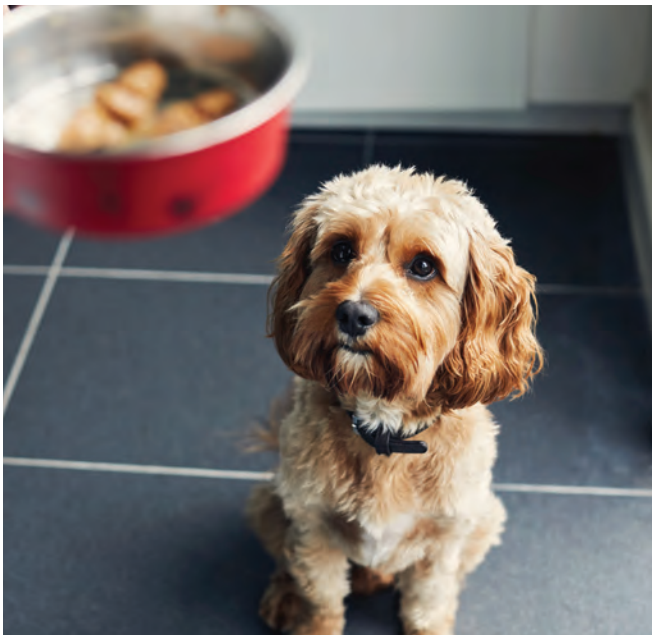
On studying this topic at length from many different perspectives, I think we can safely say that pet dogs are well adapted to an omnivorous diet, with higher requirement for meat than humans and little requirement for carbohydrates. Veterinarians qualified in veterinary natural nutrition tend to recommend the following food proportions to meet the dog's nutritional as well as behavioural and physiological needs.

DIET PROPORTIONS FOR DOGS ON AN AS FED BASIS	
Meat (protein, fat and connective tissue)	45%
Organ meat (liver, kidney and other secreting organs)	10%
Vegetables and fruits	15%
Edible bone	10%
Carbohydrates	10%
Eggs, dairy products and supplements	10%

Typical dry food nutritional analysis demonstrates much lower protein and fat proportions which are often plant or seed based, rather than animal based. The reason for this is the simple fact that animal-based ingredients are expensive. In comparison, carbohydrates are less costly, and many are even cheaper off-cuts from other commercial industries. When the carnivorous animal is seeking nourishment, they seek protein and fat, vitamins and minerals, not carbohydrates. When they are fed starches, blood glucose rises and energy requirements are met, but their physiological need for quality and highly bioavailable nutrients is not. This is why the 'energy in = energy out' mathematical formula to weight loss does not work well for all pets.

TWO APPROACHES TO DOGGY DIETING

Consider the obese Labrador Retriever started on a typical prescription weight-loss dry food, which is low calorie and low fat, while high in fibre and antioxidants. Typically, a dog is on this diet for 4-8 weeks; no headway is made on achieving a leaner body condition score and so the diet is restricted still further. Reducing volume intake reduces all the nutrients by this same 20%. The lack of protein and fat and the low nutrient density means that the pet on such a calorie restricted diet is never fully satisfied. The pet is then searching for those missing nutrients and so will scavenge,



acting as though they are starving and constantly begging for food. Pet owners, frustrated and disillusioned with these diets, cave in and offer more food and failure looms.

For a different approach, if we feed these dogs a wholesome fresh food diet that is moderate, not restricted, in protein and fat, low in carbohydrates but packed with micronutrients, the health of the dog improves, satiety improves and the quality of life of the dog's owner greatly improves as they witness their pet being settled. And best of all, the weight improves. An integrative practitioner's approach to weight loss is to ensure the dog is being offered a full range of nutritional oils and fats, multiple choices of protein and a rich variety of plant-based nutrients and fibres, high in antioxidants and phytonutrients.



Dr Kelly Halls BVSc (hons) is an integrative veterinarian with a Certificate in Veterinary Natural Nutrition from CIVT. An expertise in fresh food feeding for dogs, nutritional and herbal supplements as well as reduced vaccine and preventative medication loads for pets. She founded Bentons Road Veterinary Clinic, a clinic focused on integrative approaches in 2015, and regularly shares her insights with likeminded vets at the Natural Veterinary Practitioners Facebook group.

PREVENTION FROM PUPPYHOOD

Of course, the key to obesity prevention is to educate pet owners from the first puppy health visit on the importance of food and nutrition. We all know it is easier to keep a dog lean than to create a lean dog from a fat one. Pet owners should be taught how to assess both body and muscle condition scores, to achieve and maintain the ideal body shape. As a general practitioner, I love this early conversation in opening the eyes of the pet owner to the array of foods that are safe, healthy and beneficial for pets to eat. Most people these days are well versed in the importance of a minimally processed diet for themselves and want the best for their puppy too. More pet owners are questioning the reasoning behind feeding only one brand of dry food and veterinarians who offer advice in the field of fresh food nutrition are increasingly sought after.

Most people these days are well versed in the importance of a minimally processed diet for themselves and want the best for their puppy too.

Part of my education for new puppy owners is to teach the importance of rewarding the puppy with play, praise and touch, over always offering a food reward. Food treats are an important incentive but we should not condition the puppy to only expect food rewards. We should also offer foods in a way that engages the mind of our dogs. Simply dumping food in a bowl twice daily is boring and gives no psychological stimulation to the dog, but offering food in puzzle toys, scatter games, as bones or frozen into ice-blocks makes the dog think, or do some work to obtain their nutrition. This can be very empowering to the dog, giving them something to do and can help combat the high levels of anxiety we see in pets.

Another topic I discuss with pet owners is the benefit of a fasting period for dogs. During a fast, the body's homeostatic mechanisms fire into action, repairing damage, balancing hormones and identifying mutations. When the body is constantly being fed energy, there is no time to rest and repair and this is when cellular damage can go unidentified, paving the way for hormone disruption and cancers to develop. A fasting day or morning, or a bone-only day for a dog is a great way to introduce a time for their body to repair itself and is another tool for managing weight gain.

Drug sparing diet for itchy dogs

Multifactorial disease canine atopic dermatitis is associated with immunological dysregulation and skin barrier abnormalities. Treatment of the epidermal barrier is considered supportive alongside anti-inflammatory or immunomodulatory drugs, which may be associated with detrimental effects. A diet developed to target the pathologic mechanism of canine atopic dermatitis was fed to the test group in this double-blinded and placebo-controlled study.

Forty privately owned atopic dogs with nonseasonal pruritus were allocated to two study groups fed either the test or control diet over nine months. The test diet varied from the control diet in its levels of linoleic acid, EPA and DHA, vitamin E, taurine, lutein, turmeric (95% curcuminoids with enhanced bioavailability) and licorice extract (glycyrrhizin concentration 12% w/w).

Clear improvements were seen in pruritus score for dogs receiving the test diet after three months with a median score declining from a baseline value of 5.5 to 3.0, while no changes were seen in pruritus score in the control group. The medication score in the test group was significantly reduced by six months and maintained up to nine months, with no significant changes seen in the control diet group at any time points.

The timeline of improvement seen after three months is consistent with other studies where nutritional therapies take some time to build up to maximal skin effects, in which period classical drug administration would still be required. The drug sparing effects illustrated in this study may assist with challenges with medications typically given for control of clinical signs of CAD with regards to compliance, adverse effects and financial costs for owners.

Veterinary Dermatology 2022; 33:55-e18



Human cat allergy for veterinary clinicians

Globally, domestic cats are considered the second most common cause of indoor respiratory allergies. Prevalence of sensitisation to cats is reported to be around 5-20%, with 90-96% of cat allergic individuals sensitised to antigen Fel d 1. The strength of the human-cat bond means that few owners are willing to part with their cats, and hence alternative measures to help control Fel d 1 are important. The concept of critical threshold suggests below a certain level of exposure, a patient may be symptom free, achieved by reducing exposure in combination with other management strategies rather than complete avoidance.

Environmental modification includes removing carpeting and upholstered furniture from bedrooms and other rooms, using mattress and pillow covers with a mean pore size <math><4-6\mu\text{m}</math>, regular vacuuming with a HEPA filter, regular washing of bedding and curtains and natural ventilation. Washing cats seems to only have short-lived benefits, with washing required two to three times weekly. Currently, there is no scientific data to substantiate reports of certain breeds of cats being less allergenic, though sequence variation in Fel d 1 genes is seen in Siberian and domestic cats.

Novel approaches to human cat allergy include inducing autoimmunity to Fel d 1 in cats by immunisation, resulting in anti-Fel d 1 autoantibodies. A feline diet supplemented with anti-Fel d 1 IgY immunoglobulins is another novel approach to reducing Fel d 1 environmental contamination. This blocks the human IgE-binding epitopes of Fel d 1 but does not alter Fel d 1 production by the cat and does not interfere with any natural biological role for Fel d 1. A pilot study demonstrated that the test diet could neutralise almost 30% of active Fel d 1 in cat saliva, and reductions were seen as early as 2 weeks after starting the diet.

Journal of Feline Medicine and Surgery 2022; 24:31-42

Raw meat feeding: microbiome matters

The popularity of raw meat diets for dogs and cats is on the increase, mirroring trends in human nutrition with demand growing for less processed, more 'natural' pet foods reflecting their carnivorous nature. There is a lack of standardisation with diets varying from incomplete, unprocessed to balanced and processed, making interpretation of microbial and nutritional effects of the diets



difficult. Concerns exist around zoonosis and nutritional inadequacy of raw diets with only 15% of owners who fed home-prepared diets using a recipe obtained from a veterinarian, though there is a lack of published information to support this concern.

In healthy animals the host diet is the major driver of microbiome composition and function, and the composition of the gut microbiota from dogs and cats fed raw meat diets is distinct from those fed kibble diets. Raw meat diets are known to decrease faecal output and improve consistency, but the effect on the pet's general health is yet to be understood. Raw meat diets also have a higher apparent macronutrient digestibility compared to extruded diets, perhaps indicating increased bioavailability of the macro and micronutrients present in the diet.

Various studies in healthy dogs have shown that raw meat diets have shown no difference, greater or reduced gut microbial diversity to those on commercial diets. It is commonly thought that greater gut microbiota alpha diversity is associated with greater functional resilience, with lower diversities thought to be inferior however interpretation of drivers and consequences of diversity are complex. Some of the most beneficial host-microbiota relationships exhibit exceedingly low diversity because of co-evolution between a host and its microbiota. Microbial diversity may also reflect the type and complexity of dietary nutrients consumed by the host and available for bacterial fermentation in the gut, with most obligate carnivores, having a narrow range of prey species in their diet and being monogastric, demonstrating inherently lower microbial diversity than omnivores and herbivores.

New Zealand Veterinary Journal 2022; 70:1-9

Beta-glucan for obese dogs

Beta-glucans are polysaccharides composed of glucose

monomers linked by β -glycosidic bonds and are major structural components of the cell wall of yeasts, fungi and some bacteria. Its mechanism of action in the body is complex, with modified immune responses, reduced inflammatory response and altered glucose and lipid metabolism associated with supplementation in humans, pigs, dogs, rats and fish. This study aimed to evaluate the effects of 0.1% beta-glucan dietary supplementation on different glycaemic, insulinaemic, serum triglyceride, cholesterol, inflammatory cytokines and satiety markers in obese dogs.

Fourteen dogs participated in the study across three experimental groups, with a lean group, an obese group and an obese supplemented group (the obese group after consuming the experimental diet for 90 days). In obese dogs receiving the 0.1% beta-glucan diet, several glycaemic variables, basal serum insulin levels and triglyceride levels resembled those in the lean group. Interestingly, four of the seven obese dogs presented with leftover food as the study progressed and none of the dogs manifested begging behaviour to obtain more food. This is consistent with evidence seen in human studies of minimal beta-glucan levels performing appetite-regulating effects through circulating incretins.

Compared to the obese group the supplemented obese group had lower plasma basal glycaemic values, and reduced serum cholesterol and triglyceride levels. Treatment of obesity is challenging, with one factor being a lack of satiety in achieving negative energy balance. This study shows a possibility of utilising beta-glucan in obesity prevention and treatment.

BMC Veterinary Research 2022 18:14

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