BULLETIN OF THE

PET PRACTITIONERS ASSOCIATION OF MUMBAI

(FOR CIRCULATION AMONGST PPAM MEMBERS)

JULY - SEPTEMBER 2023

PPAM Extends a Warm Welcome to FASAVA Delegates in Amchi Mumbai

Samadhi (Tomb) of dog Waghya of Maratha King Chhatrapati Shivaji Maharaj at Raigad Fort

Kala Ghoda

Gateway of India

SGNP Mumbai

Marine Drive

Kabutarkhana

Bai Sakarbai Dinshaw Petit Hospital for Animals established in 1874

Mumbai Lifeline (Local Train)

Contents

Bandra Worli Sea Link

Chhatrapati Shivaji Maharaj Vastu Sangrahalaya (Museum)

Veer Jijamata Udyan (Rani Baug), Mumbai

Dr. S. V. Vishwasrao
Ph.D. (Surgery)
Editor, PPAM Bulletin
vishwasraodr@hotmail.com
Mobile : 9322242184

Editorial

PPAM Promise of a Bright Future: A Strong Foundation of 26 Years

Pet Practitioners Association of Mumbai (PPAM) has been steadily progressing since it was founded on 20th January 1997. Dr. Snehkant G. Swali and Dr. Trilok M. Telang were the initiators and founding members for the establishment of PPAM, both initiated the process by holding the first meeting in Orchid Hotel Chembur, Mumbai on 20.01.1997. Around 23 to 25 small animal practitioners attended the first meeting. Thus began a long journey and today PPAM stands proudly as an oldest and most sought-after association of small animal practitioners in India. One of the best effects of growth and spread of PPAM is we have new life and annual members adding up every year. As of the latest figures we have 425 life members and 365 annual members.

Why PPAM was formed is important to understand. Both our founding members Dr. Snehkant G. Swali and Dr. Trilok M. Telang were exclusively private practitioners. They had the vision that coming together by practicing veterinarians was the first step in addressing our needs. Based on this idea, values and mission of PPAM were based. The coming together of practitioners highlighted the problems that existed and together they discussed the strategic steps to be taken to solve it.

PPAM was formed according to the typical Indian tradition, as per the views of Mahatma Gandhi to manifest the latent, implicit and dormant potential inherent in a human being and develop a veterinarian the capability relating to "head, heart and hand" that is knowledge, wisdom and skill. Our Indian tradition emphasis that professional organization like PPAM should work similar to a teacher, it should stimulate veterinarians the spirit of inquiry, criticism and evaluation so the minds may acquire the habit of exercising independent and unbiased judgement and learn to discriminate between adequate and inadequate, relevant and irrelevant data, and to avoid the extremes of haste and indecision in arriving at a conclusion.

Professional organizations such as PPAM is the ultimate go-to resource for driving change in our veterinary profession, our communities, cities, and beyond. PPAM now offers more than networking opportunities, and educational resources but also PPAM is a community changemaker, a thought leader, and hub of power for the small animal practitioner.

PPAM is now in a position to be able to challenge and protect its interests through the collective action of our members and similar thinking organizations. We at PPAM have advanced these shared interests in the public policy process by educating and engaging members, promoting awareness of their challenges, and pooling resources to collaborate with other like-minded organizations. Our organizations continue to be an influential force in social and political change. Advocacy on an issue that affects the small animal practitioner, their working conditions and safety, and encouraging others to support that position to better their day-to-day lives.

PPAM has always taken mature, practical and scientific stand whenever issues relating to animals or the profession have emerged. A benefit to advocacy is that there is no cost involved beyond an organization's time, people within and even those not directly involved can push for change. This has over period of time created a broad support base for whatever challenges the profession faces today.

As the primary source of Profession-specific education for our members, we have had a unique opportunity to inform and

shape public opinion through resources and reach. By providing access to current information, PPAM has educated their members on fundamental challenges and help them stay informed about the latest developments in their field. These educational benefits are accessed by members through conferences, PPAM bulletin, social media pages, published clinical articles, and events. Such information remains a valuable asset to the member and helps form public opinion.

We at PPAM believe that with education comes empowerment, and by providing members with the knowledge and skills, members will be empowered to become active participants in the social process and drive meaningful change.

We have strong representation on various organizations at state, national and international level, and are in the best position to speak out on behalf of our members, ensuring their needs and concerns are heard and considered.

PPAM believes that desired goals can be achieved not merely by imparting factual, disconnected pieces of information in isolation but logically and passionately analysing the given information and synthesising it in the context of current state of knowledge. We believe that we can successfully do so if PPAM members continuously refresh their knowledge and skills and keep abreast with new knowledge and persistently engage in research.

With continuing education programs, seminars, hands on workshops have added value and knowledge to the clinical ability of our pet practitioners. We at PPAM believe that in order for our organization to be successful in our chosen objective we need to be committed to growth. We at PPAM firmly believe that without the strong desire to grow there will be no growth at all.

PPAM during the last 26 years has overcome several challenges organizational, economic, logistic, administrative but through strong will and unflinching support from PPAM members these challenges were overcome successfully.

PPAM has had landmark events during the course of the journey in the last 26 years. National Conferences, Organizing International Congress, hands on workshops outside and within India, collaboration with Veterinary Colleges and Universities all this altered the trajectory of PPAM and set our organization for success creating a bench mark for others to follow.

PPAM have regular meetings with members, industry representative, non-government organizations, animal husbandry departments of the state and central government, local city governing bodies, the municipal corporations, academic institutions, so that our concerns, plans and road map for the future can be dynamically addressed.

We also make special efforts so that among PPAM members there is increasing pride and enthusiasm to give their best to the pet world. We create a compelling narrative that highlights what sets PPAM apart from others, this helps members gain a sense of pride and enthusiasm in being part of our unique organization.

Dr. Kirti Doshi senior veterinarian from South Mumbai and life member PPAM opines that in future more and more wet labs be organised for practicing veterinarians so that each member gets better and better with each passing day.

PPAM members believe that in future we all must continue to find new ways to effect scientific and social change for the benefit of animals, practicing veterinarians, the environment and society as a whole.

It's a pleasure to invite for the Two days **Hand's on workshop Training programme in Ultrasonography of Canines**. This training programme is organised by Department of Veterinary Surgery & Radiology in collaboration with PPAM in Mumbai Veterinary College Parel.

Course Teacher
Dr. K. Jeyaraja
MVSc (Medicine), Ph.d
Professor, Dept of Veterinary Clinical Medicine,
Madras Veterinary College, Chennai

Course Director
Dr. G. S. Khandekar
MVSc (Surgery), Ph.D,
Professor & HOD Dept of Surgery & Radiology,
Mumbai Veterinary College, MAFSU.

Date : 25th – 26th October 2023 (2 days)

TOPIC 1 : Small animal abdominal ultrasonography - on day 1 (25th October 2023)

TOPIC 2 : USG – Small animal thoracic ultrasonography - on day 2 (26th October 2023)

Venue : 'Centre of Excellence of Veterinary Minimally Invasive and Diagnostic imaging Centre for Treatment, Research and Training', Mumbai Veterinary College, Parel, 400 012.

SCHEDULE : 9 AM TO 4.30 PM
(Includes, Breakfast, Lunch and Tea)

Charges :	
PPAM Members and All Participants of FASAVA Congress 2023, and All members of FSAPAI Affiliated Association	Rs. 20,000/-
Non PPAM/Non FSAPAI affiliated associations Members	Rs. 30,000/-
For All Regional Vets affiliated to Members of FASAVA	400 USD

* Kindly note that limited seats available for this training.
* Kindly note that accommodation is not provided for the participants.

For RSVP and Payment details,
Kindly contact PPAM Joint Secretary Dr. Anil Vade (7977256390) on or before 20th October 2023.

For Payment RTGS details :
Name of A/C :Pet Practitioners Association of Mumbai
A/C no :0013000177467, HDFC Chembur Branch, HDFC0000013

Regards
PPAM Managing Committee

PPAM - A Journey of 26 Years & Ahead

Dr. C. C. Wakankar, Ex President, PPAM

Almost 10 years before the birth of PPAM, an idea to from an association of practicing veterinarians of Mumbai was germinated. However, this did not bear any fruits. Perhaps, these attempts seeded the need of coming together which eventually came into existence in the form of PPAM.

Starting with barely a few members, it has become India's pioneering and largest association which provided impetus to other similar groups. Behind this were attempts of founder members and offices bearers who selflessly worked for the goal to take PPAM to today's position. Starting with small gatherings, events with magnanimous participation soon became a story of those days. The association took initiatives to render advance education and organise social events for member families. A major step that glorified the success of the association was to organise a one-to-one basis exchange of ideas by bringing together various vendors in the animal health sector with its members-The event became famous with the name of 'Meet the Industry'. The association has not left the involvements of future vets. Outreach programmes were designed for this purpose.

PPAM represented India at world level by becoming a member of WSAVA. When the Indian veterinary fraternity started growing, PPAM took a lead to form 'Federation of Small Animal Practitioners Association of India' to spread its ideology to Indian subcontinent. Today, PPAM proudly represents itself to 'Federation of Asian Small Animal Veterinary Association' to the Asia region.

Future of PPAM is certainly bright with more members joining its fold. At the same time, bigger responsibilities fall on the shoulder of PPAM. Representation of small animal practitioners at National level must be voiced for various causes of betterment of industry. PPAM needs to actively participate in policy making in this regard. Similarly, the nature of practice is evolving so rapidly to bring mental and financial stress on the members. Steps to take up these challenges need to be formulated. Of course, educational upliftment cannot be neglected and has to be dealt simultaneously. Demand of 'Hands on trainings' is ever increasing.

At this juncture, a rising need is felt to keep its members abreast with various laws and rules framed by the governing authorities from time to time. Periodic updates need to reach in this regard to the members.

PPAM needs to have its own office establishment to avoid incurring expenses of hiring facilities. Surely, this will be taken up in the coming time.

I am quite sure that office bearers of today and 'would be' are capable to handle the needs of time.

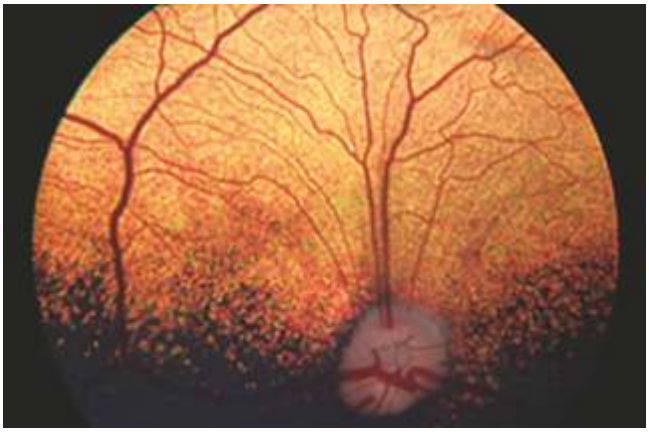
Wishing PPAM all the best.

A Glimpse into the Complexity and Joy of Eye Care for Animals

Dr. Kasturi Bhadsavle
Senior Veterinary Ophthalmologist and Founder : The Eye Vet Clinics

The eye, in both humans and animals, is a marvel of physiological ingenuity and anatomical intricacy. This sensory organ stands as a testament to the complexity of nature and evolution, a perfect blend of form and function. The eye has clear, transparent components ingeniously designed to permit the unobstructed passage of light. Even more astounding is the fact that the eye is the only part of the body where one can directly observe the brain—in the form of the retina. It is little wonder then that eyes have often been referred to as the "windows to the soul."

But how can one truly understand an animal's vision? For those of us in veterinary ophthalmology, that's an intriguing question we often get asked. Unlike human patients, animals cannot communicate their symptoms verbally. Yet, their body language and behavior offer vital clues.

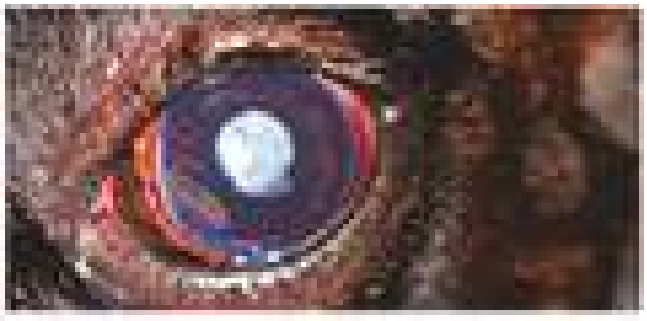


A Diverse and Rewarding Field

Another question I encounter is whether specializing in veterinary ophthalmology limits the scope of one's practice. The answer is a resounding no. The sheer diversity of species and eye conditions we treat prevents monotony from setting in. Whether it's a dog's cataract or a horse's corneal disease, each case presents its own unique set of challenges and joys. From household pets like cats and dogs to horses and exotic creatures such as guinea pigs, birds, leopards, and even snakes, the variety is endless. Each species has its own distinct ocular anatomy with beautifully colored eyes and unique issues, making our job a fascinating endeavor.

Transformative Healing

The fulfillment we derive from our work isn't just intellectual; it's deeply emotional. Restoring sight to a blind animal is a transformative experience, both for the pet and its family. The immediate behavioral



change in an animal that regains its vision is heartwarming to witness. However, our responsibility extends beyond clinical care. We are also educators, helping pet owners understand the risks, benefits, and expectations of surgical procedures.

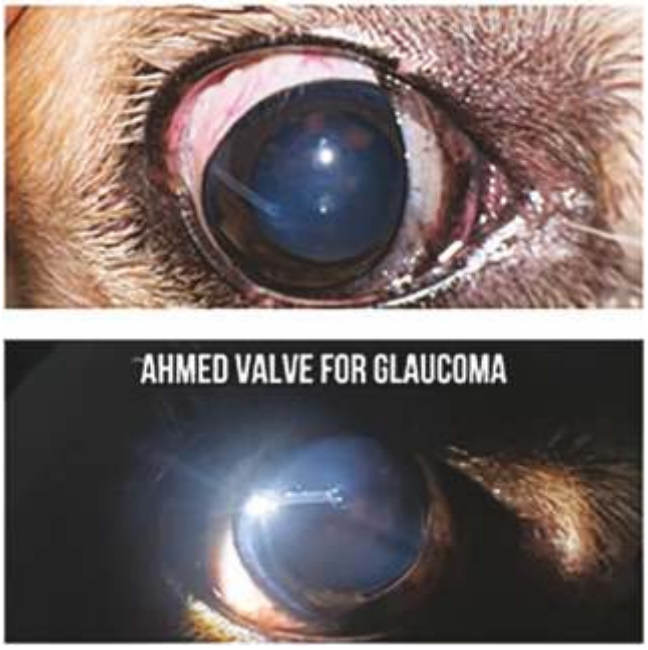
For instance, cataract surgery in dogs at TEV boasts a success rate of over 95%. But it's crucial for pet parents to understand that not all cataracts are the same. While the procedure is generally successful, some animals may have non-functional retinas or could be poor candidates for anesthesia. The decision-making process is nuanced, requiring a fine balance of medical judgment and compassionate communication.

Making Critical Choices

What sets veterinary ophthalmologists apart is their ability to make critical choices based on years of specialized training and relentless focus. Whether it's choosing the appropriate corneal graft for a ruptured ulcer or deciding when an eye is beyond repair, our specialization allows us to offer the best possible care. The clarity gained from focusing solely on ophthalmology often makes the difference between vision and blindness, or even life and death in extreme cases.

Glaucoma: A Silent Killer No More

If there's one condition that serves as a stark reminder of the unique challenges we face, it's glaucoma in dogs. Unlike in humans, where glaucoma is often a silent thief of vision, the condition is anything but quiet in dogs. The agony it causes is palpable, frequently leading to permanent blindness if not treated in time. For many years, the best we could offer were end-stage procedures to manage the unbearable pain. However, relentless focus and sleepless nights invested in research to find the solution. Today, we can offer a surgical solution to extend the vision of dogs and cats suffering from primary glaucoma if they reach us in time. By surgically inserting an Ahmed valve into the anterior chamber of the affected eye, we are helping to manage this debilitating condition, particularly common in certain breeds like Siberian Huskies.



The Importance of Teleconsultation

In an increasingly connected world, geography should not be a limiting factor for quality veterinary care. That's why teleconsultation has become a crucial tool in our practice. When a pet in a remote

area shows signs of eye distress, immediate expert advice can make the difference between saving and losing an eye. Once consulted online, many pet parents choose to travel to our clinics in Mumbai or Pune for definitive treatments. The sense of satisfaction we gain from restoring vision for pets who come from afar is immeasurable.

Why Specialization Matters

As the relationship between humans and their pets evolves, so do expectations for their healthcare. Pet parents today are more informed and demand specialists for their pet's medical needs. This places a greater responsibility on general veterinary practitioners to recognize when to refer a case to a specialist. And for conditions as complex and potentially life-altering as eye diseases, specialization is not a luxury—it's a necessity.

Specialization allows for an in-depth understanding that general practice simply cannot provide. It's not merely about diagnosing and treating an illness but about advancing the field through focused research and education. At TEV, we are committed to nurturing the next generation of veterinary ophthalmologists through our three-year residency program, backed by a world-class training curriculum and the expertise of 37 renowned ophthalmologists from around the world.

In Conclusion

Veterinary ophthalmology is not just a job; it's a calling that offers a perfect blend of intellectual stimulation and emotional satisfaction. It's about bringing together specialized knowledge, surgical skill, and a profound understanding of animal behavior to make impactful changes in the lives of pets and their families. From guiding a pet parent through the difficult journey of eye disease to seeing the joy in an animal's eyes (and its owner's) when vision is restored—these are the moments that make every challenge worthwhile.

And for the curious minds and enthusiastic new veterinarians or veterinary students out there, remember: the road to specialization is challenging but immensely rewarding.

So, the next time someone asks, "Why specialize in eyes?", I'll simply say: "Because the eye is a universe in itself, full of complexities and miracles waiting to be discovered."

Successful Surgical Correction of Intestinal Volvulus in HF cow

Dr. Chaitrali Ashok Avhad

A case of 7 months pregnant HF crossbred cow was presented, with the history of colic, straining since 3-4 days, absence of defecation since 3-4 days and inappetance. Clinical examination revealed dehydration, arched back stance, colic and abdominal straining. Per rectal examination revealed empty rectum with thick sticky mucus.

The case was diagnosed as intestinal obstruction based on history and clinical signs. Animal was stabilized with adequate fluid therapy and supportive drugs, and exploratory laprotomy was planned.

Right flank laprotomy was done and the site of obstruction was searched. Palpating ballooning of intestines the volvulus was located. About 1.5 meters of large intestine, specifically colon was involved in the volvulus. The case was unique due to multiple twists of colonic volvulus leading to strangulation, ischemia and gangrene of colon. The affected gangrenous portion of intestine and mesentery was resected. The healthy ends of resected intestine were apposed by end-to-end anastomosis using Connell followed by Lambert's suture pattern using catgut no. 2-0. Unripen banana was used as support for anastomosis. Mesentery portion was also sutured and aligned accordingly. Abdomen and skin was sutured as routine.

The cow showed uneventful recovery. She passed semisolid feces 3 hours after surgery. Post operatively cow was maintained on fluid therapy, antibiotics, analgesics and soft diet for next 5 days.

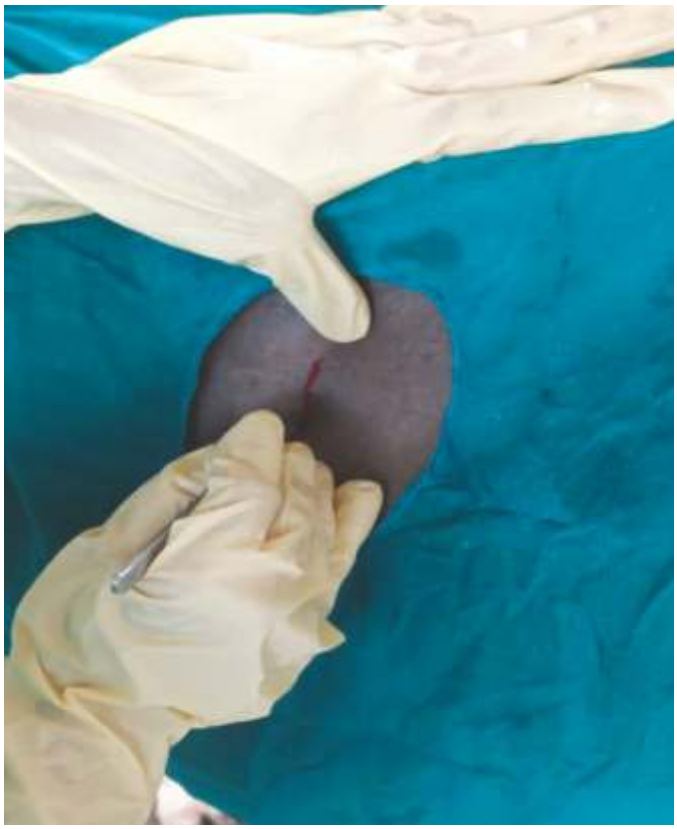
Intestinal volvulus is twisting of the intestinal loop on the mesenteric axis. Altered motility, strenuous exercise and rolling may be initiating causes for the same.

Mechanical obstructions almost always require surgical intervention. Abrupt changes in feeding and management, inadequate watr intake, parasitic infestation, highly fermentable foodstuffs, foreign material ingestion should be avoided for prevention of intestinal obstruction cases.

The above case was diagnosed and surgery was performed on field by Dr. Chaitrali Avhad, Livestock Development Officer, Veterinary Dispensary- Grade 1, Kedgaon, Daund, Pune.

7 months pregnant HF crossbred cow presented

Preparation of surgical site



Right flank laprotomy incision

Colonic volvulus located

Arrow marked area shows first twist of colonic volvulus

Resected intestinal loop

Unripen banana was used as support for anastomosis

End-to-end anastomosis using Connell followed by Lambert's suture pattern using catgut no. 2-0

Suturing of abdominal cavity

Resected gangrenous portion of intestine

Uneventful recovery of cow

Stop Rabies Project

A Partnership between PPAM, MCGM (Municipal Corporation of Greater Mumbai) and Boehringer Ingelheim India for the Stop Rabies Project has started, that aims to vaccinate uncared dogs and cats and drive awareness around rabies.

Boehringer Ingelheim India will support the first campaign of the Stop Rabies project by providing vaccines for 25000 uncared dogs and cats. This campaign will begin on World rabies Day 28-09- 2023 and will run for approximately 15 days. This will include vaccination of uncared animals and in parallel build and run education drive among schools, starting in September.

PPAM, MCGM, and Boehringer Ingelheim India shall also work on public awareness of the vaccination drive by way of a press release and other appropriate feasible media engagement to create awareness of the stop rabies project.

PPAM and Boehringer Ingelheim CE held at Hotel Westin on 9.07.2023.

PPAM and Boehringer Ingelheim CE held at Hotel Westin on 9.07.2023. Topics and speakers were.

Sr. No.	Speaker	Topic
1.	Dr. N. C. Prakash Reddy, M.V.Sc, PhD, Associate Director, Regulatory Affairs & PV (South Asia)	Recombinant technology in Canine vaccines- redefined protection.
2.	Dr. G. Pampapathi, BVSc, MVSc (Gold Medalist), NVE(Australia)	Interactive Session on Clinical Case Studies- How I Treat.

Appeal to PPAM Members to Renew Membership

1. Renewal of Annual Membership	Rs. 1500.00 + GST (Rs. 270.00) = Total Rs. 1770.00
2. New Membership	Rs. 1750.00 + GST (Rs. 315.00) = Rs. 2065.00
3. Life Membership	Rs. 17500.00 (No GST)

Bank Details :

Indian Bank; A/c name - Pet practioners association, Branch- Santacruz (w)

A/c no. 744946564 , IFSC: IDIB000S010

(As soon as payment transfer is made please send a message to Treasurer Dr. Anil Vade on 9820016420. Please also mention your complete name, date of payment and transaction id)

VET-PRO®

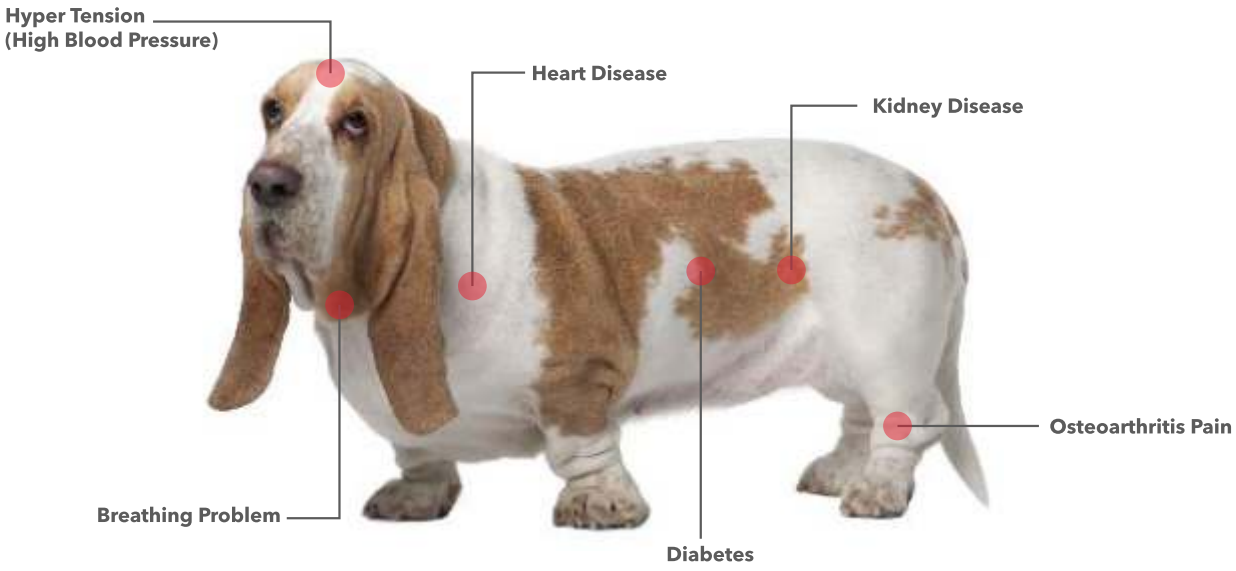
Specially Formulated by Experienced Veterinarians
& Animal Experts in the US

drools®
Feed Real. Feed Clean.

IS YOUR PET OBESE?

50% of dogs in India are overweight or **obese**.

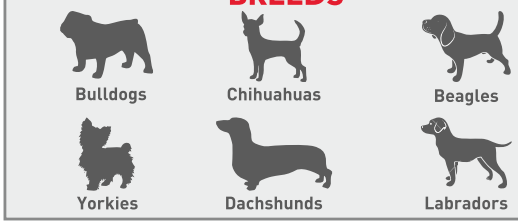
Risks of being overweight



CAUSES

» Access to too much food
» Food high in carbs and fat
» Not enough exercise or play time

COMMONLY OVERWEIGHT BREEDS



LOW FAT DIET FOR OBESITY CONTROL & WEIGHT MANAGEMENT

Why VET-PRO Obesity?

Low fat, thus low calorie content
Choline chloride, Lysine & L-Carnitine for increasing fat metabolism
Yucca extract helps to reduce stool odour
High Protein : Calorie ratio to maintain healthy body
High natural fibre to satisfy appetite & healthy digestive tract.

SCAN TO KNOW MORE

A Review on Therapeutic Cardiac Diets

Dr. Pooja CH

M.V.Sc (Veterinary Biochemistry), Veterinary Product Specialist, Drools Pet Food Pvt. Ltd.

1. Introduction

Your dog's diet is a powerful tool to effectively manage various medical conditions. Cardiac diseases in dogs have been extensively researched worldwide, but there is a scarcity of information available in India (Devi et al., 2009). Despite these circumstances, many dog owners remain unaware of the potential risk of heart disease in their pets. As well as treating canine heart disease with medical interventions there's also evidence suggesting that monitoring and changing your dog's diet is an important part of treatment and can support a good quality of life (Vengsarkar, 1988). The first step toward determining the best nutrient profile to feed your dog with CHF is to work with your veterinarian to determine what, if any, other medical conditions might be present in your dog. For instance, hypothyroidism, chronic kidney disease, and obesity are common in older dogs. Any, or all of these conditions may be present and would benefit from good nutritional choices. The key to success is understanding which disease takes precedence. Often, these diseases are not detected until noticeable symptoms become pronounced (Martin et al., 2009). This review article will throw a light up on clinical significance of Canine Heart Diseases (Cardiac Cachexia, Congestive Heart Failure (CHF), dilated cardiomyopathy (DCM)) and their nutritional management & highlights the key nutritional factors for dogs.

2. Clinical significance of Canine Cardiac diseases

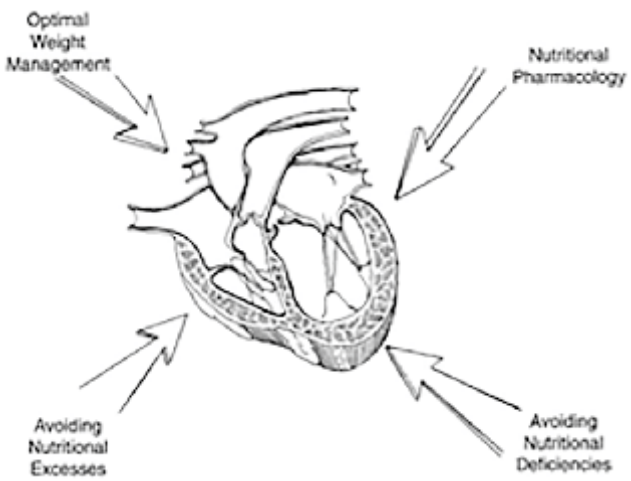
Canine heart diseases encompass various conditions that affect the heart and its function. Cardiac cachexia, a condition characterized by the loss of lean body mass, is a prevalent syndrome in dogs suffering from heart failure. Amino acids from muscles serve as the main source of energy in a dog with injury or sickness, including Congestive heart failure (CHF), leading to loss of lean body mass. Dogs with CHF frequently have cardiac cachexia, or weight loss. Research indicates that more than half of dogs afflicted with dilated cardiomyopathy (DCM) and heart failure experience some degree of cachexia (Freeman et al., 1998). Cardiac cachexia is a complex issue influenced by multiple factors, including reduced food consumption, heightened energy demands, and an increased release of inflammatory cytokines. While these variables contribute to the loss of lean body mass, the generation of inflammatory cytokines including tumor necrosis factor (TNF) and interleukin-1 (IL1) is a prominent contributor in this illness. Furthermore, as our understanding of alterations in inflammatory agents and energy metabolism in congestive heart failure (CHF) advances, we are increasingly recognizing the potential impact of nutrition in optimizing the care of cardiac patients. These inflammatory cytokines have been shown to raise energy needs, catabolize lean body mass, and directly cause anorexia (Freeman and Roubenoff 1994).

Common signs and symptoms of Heart Diseases

- Persistent coughing
- Difficult breathing
- Fainting
- Weight loss
- Reduced ability to exercise

3. Nutritional management of Canine Cardiac Diseases

Beyond medications, a crucial component of managing canine cardiac conditions is dietary adjustment. This includes preventing deficiencies in vital nutrients like taurine and B vitamins while also avoiding excess sodium intake. Furthermore, specific nutrients such as antioxidants and omega-3 fatty acids can offer additional benefits beyond their primary nutritional roles. To effectively address cardiac cachexia in dogs, the key focus of nutritional



management revolves around ensuring they receive an adequate intake of calories and protein. Simultaneously, efforts are made to regulate the production of cytokines, which are signaling molecules involved in inflammation. This approach aims to counteract the loss of body mass and muscle tissue observed in dogs with cardiac cachexia (Devi S and Jani 2009). Nonetheless, one of the most critical aspects of providing optimal care for dogs with heart failure is maintaining their ideal weight and body condition. Balanced nutrition and weight management play a pivotal role in enhancing the well-being and longevity of dogs with heart disease.

3.1 Obesity

Obesity is prevalent in 30% to 40% of dogs and cats in the United States, with overeating being the primary cause, although endocrine diseases can contribute. Obesity is believed to have negative effects on animals with pre-existing cardiac conditions, even though controlled clinical trials are lacking. This is possible because obesity is associated with elevated cardiac output, increased plasma and extracellular fluid volume, heightened neuro humoral activation, reduced urinary sodium and water excretion, increased heart rate, abnormal ventricular function, exercise intolerance, and elevated blood pressure(Alexander JK.,1986). In obese dogs with pulmonary issues, weight loss improves lung function (Brinson JJ., 1998). Thus, it is advisable to recommend gradual weight reduction for obese dogs with concurrent cardiac disease.

3.2 Key Nutrients and Supplements (Avoiding nutritional overload and nutritional deficiencies)

There can be nutritional overload and deficiencies that arise as a result of heart disease and its treatment. Additionally, supplementing specific nutrients may offer advantages beyond their basic nutritional functions, a concept known as nutritional pharmacology.

3.2.a Sodium and Chloride

Dogs with heart disease have reduced ability to excrete sodium in their urine. Despite the ease with which excess dietary salt may be excreted in the urine in healthy animals, this response is attenuated in animals with cardiac illness as a result of compensatory reactions to decreased cardiac output (Boegehold MA, Kotchen TA 2000). This means that sodium, or salt, is one nutrient that should be restricted to help reduce fluid accumulation. Fluid can build up in the lungs and in the abdomen causing coughing, difficulty breathing and a swollen abdomen. Retention of salt, chloride, and water is linked to the CHF syndrome. In the past, the main objective of cardiac diets was salt reduction. It is now understood that sodium's interaction with chloride has a significant role. Therefore, in order to get the full rewards of a diet, both sodium and chloride must be restricted.

Depending on how severe your dog's illness is, sodium intake should either be moderately or highly reduced. Foods that tend to be high in salt include ham, canned fish and cottage cheese along with table scraps and some store bought treats. Reducing these, and other high-salt foods in your dog's diet will help to reduce their sodium intake.For animals without congestive heart failure (CHF), moderate sodium control (sodium <0.40% dry matter for cats and dogs) is advised, emphasizing avoidance of high-sodium diets and treats. Recommendations for low-salt treats can be helpful. When CHF develops, stricter sodium and chloride restriction (sodium <0.30% dry matter for cats and dogs) is recommended. Senior pet diets can often meet this requirement. Diets designed for animals with renal disease are not recommended for most cardiac patients (unless there is concurrent renal failure) because of the protein restriction. In advanced CHF, more profound sodium-chloride restriction may reduce diuretic needs, necessitating specialized cardiac diets. These diets are available from various pet food companies, characterized by strict sodium and chloride control with variable nutrient content.

3.2.b Protein

Some of the diets created for dogs with heart illness are low in protein (3.6 - 4.2 g/100 kcal), which should not apply to canines with CHF unless they also have severe renal disease. To satisfy the maintenance needs of dogs (5.1 g/100 kcal), high-quality protein should be given unless there is significant renal impairment (serum creatinine >3.0 mg/dL).

3.2.c Arginine

Researchers are exploring arginine supplementation in congestive heart failure (CHF) patients due to endothelial dysfunction. In normal individuals, it may not significantly impact nitric oxide production, but in CHF patients, arginine supplementation has shown potential benefits, including improved vasodilation,

reduced heart rate, and lowered vascular resistance without adverse effects on cardiac function. Further research is needed to confirm these findings

3.2.d Taurine

The myocardram has large concentrations of the amino acid taurine. It has been extensively documented how taurine deficit contributes to feline DCM (Pion PD et al., 1987). Most dogs with DCM do not have low taurine concentrations, although some dog breeds with DCM have this condition (Krammer et al., 1995).The American Cocker Spaniel is the breed where this has been proven to work best (Krammer et al., 1995). In a recent research, taurine and carnitine supplements improved clinical indices and echocardiography data in 11 Cocker Spaniels (Kittleson MD et al., 1997). However, in Cocker Spaniels and other unusual breeds with DCM, assessment of plasma and whole blood taurine concentrations is necessary. Taurine has been proven to have positive benefits in individuals with taurine deficiency as well as in animal models of experimentally caused heart failure. (Elizrova EP et al. 1993). Minimum taurine requirements for dogs have not been established by AAFCO, but a diet with a taurine content of 50 mg/100 kcal would provide approximately 1000 mg/day of taurine to a 40 kg dog.

3.2.e L-Carnitine

L-carnitine, synthesized from lysine and methionine, plays a vital role in skeletal and cardiac muscle for fatty acid metabolism and energy production. It was initially linked to canine dilated cardiomyopathy (DCM) in boxer dogs (Keene BW 1992). Carnitine deficiency can be systemic, plasma, or myocardial, with dogs mostly having the myocardial form, diagnosed via endomyocardial biopsy (Pierpont MEM, 1993).However, its causative role in DCM remains unconfirmed, as rapid pacing-induced heart failure in dogs reduces myocardial carnitine concentrations. While some recommend carnitine supplements for cardiac patients, evidence suggests benefits primarily for those with carnitine deficiency.

3.2.f Potassium

Furosemide use can lead to potassium loss, which can be harmful by promoting arrhythmias and enhancing the effects of digitalis toxicity. Conversely, medications like angiotensin-converting enzyme inhibitors can increase potassium levels. In dogs with congestive heart failure, some may experience mild elevations in potassium when treated with sodium-restricted diets, furosemide, and captopril (Roudebush P et al., 1994). While significant hyperkalemia is rare, caution is needed when supplementing potassium or using high-potassium diets alongside angiotensin-converting enzyme inhibitors. Monitoring serum potassium levels is essential for effective medical and dietary management in cardiac patients.

3.2.g Magnesium

Furosemide use can lead to hypomagnesemia by increasing urinary magnesium loss. Hypomagnesemia can trigger arrhythmias, weaken myocardial contractility, and enhance adverse cardiac medication effects. While some studies found lower magnesium levels in congestive heart failure patients, it's inconsistent in veterinary studies (Cobb.,1991 and O Keefe., 1993). Serum magnesium levels may not reflect total body stores accurately, but periodic evaluation, especially for arrhythmia patients, is advised. Magnesium supplementation is only recommended when deficiency is confirmed, with no proven benefit in non-deficient patients.

3.2.h B complex Vitamins

Increased quantities of water-soluble vitamins are typically seen in commercial therapeutic meals made for animals with heart illness in order to counteract probable urine losses so supplementation usually is not required. Beyond their dietary impacts, nothing is known regarding the consequences of B vitamin supplementation.

3.2.i Coenzyme Q10

Coenzyme Q10 is used in canine DCM due to its role in energy production and antioxidant properties. However, controlled studies are needed to confirm its effectiveness. Recommended doses range from 30 mg twice daily to 90 mg twice daily in larger dogs, but whether it corrects deficiencies or has pharmacological effects remains unclear (Freeman., 1998)

3.2.j Omega-3 Polyunsaturated Fatty Acids (PUFA)

Omega-3 fatty acids PUFA, like Eicosapentaenoic acid (EPA) and Docosahexaenoic acid (DHA), differ from omega-6 fatty acids in structure and function. Dogs with CHF often have low EPA and DHA levels

(Freeman et al., 1998). Fish oil supplements, rich in omega-3s, can correct these deficiencies, reducing inflammation and cytokine production. Fish oil may also improve appetite and have antiarrhythmic effects. A recommended dosage for dogs with CHF and related issues is around 40 mg/kg EPA and 25 mg/kg DHA. It's crucial to check the EPA and DHA content in supplements, and capsules with 180 mg EPA and 120 mg DHA are available. Avoid supplements with additional nutrients to prevent toxicity (Kang 1996).

3.2.k Antioxidants

Reactive oxygen species are natural by-products of oxygen metabolism. In certain situations, their levels can exceed the body's antioxidant defenses. Antioxidants, including enzymes like superoxide dismutase and vitamins like C and E, can counteract oxidative stress. Dogs with heart disease may experience increased oxidative stress, suggesting potential benefits from antioxidant supplementation.

3.2.l Herbal and Other Nutritional Supplements

Numerous nutritional supplements are marketed for pets and people with heart disease, including those from animal hearts, herbal remedies, and nutrient combinations. However, many of these combination supplements have insufficient nutrient levels to provide benefits, and their efficacy and safety lack evidence. Therefore, they are not recommended for animals with cardiac disease.

3.3 Dietary Guidelines

Enhancing a dog's food intake can involve several strategies. One approach is to offer smaller, more frequent meals throughout the day. Another is to gently warm the food to body temperature, making it more enticing. Some dogs may show a preference for refrigerated meals. To make dietary changes smoother, consider gradually transitioning to a more palatable diet. This can mean switching from dry to canned food, changing brands, or even consulting a veterinary nutritionist for a customized homemade diet plan. Additionally, you can use flavor enhancers like yogurt, maple syrup, or honey to make the food more appealing to your canine companion (Devi S and Jani 2009). Supplementing a dog's diet with fish oil, which contains high levels of n-3 fatty acids, has the potential to lower cytokine production in cases of congestive heart failure (CHF) and enhance the condition of cachexia (Freeman et al., 1998).

Factors	Dietary recommendations
Protein	25– 30%
Phosphorous	0.2 – 0.52%
Sodium	0.08-0.25%
Chloride	0.12-0.38%
Potassium	0.4 – 0.52%
Omega 3 fatty acids	0.6-0.9 %

- Low levels of sodium: Reduces Heart workload
- High quality Protein: Supports cardiac function
- Omega 3 fatty acids: Supports cardiovascular function
- Taurine: Regulate the contraction of myocardium
- L- carnitine: Enhances the fat transport
- Antioxidants: Neutralize free radicals and promote healthy immune system.

4. Conclusion

Commercial veterinary diets for cardiac disease in dogs and cats typically prioritize low sodium and chloride while providing higher B vitamin levels. Some non-specialized diets, like senior or premium adult maintenance options, can be suitable for early-stage cardiac issues. These diets vary in protein, fat, magnesium, potassium, and fatty acids. Choosing the right diet depends on disease stage, clinical signs, lab results, and appetite. Careful consideration is vital as some diets may not align with individual needs, such as low protein for cachectic pets or high fat for obese ones. Palatability is key to ensure the pet maintains an optimal weight. Besides balanced commercial diets, nutrient supplementation may offer benefits for deficiencies or pharmacological effects. Ongoing research aims to refine dietary management for dogs and cats with cardiac conditions.

5. References

Kittleson MD, Keene B, Pion PD, et al: Results of the multicenter spaniel trail (MUST): Taurine- and carnitine-responsive dilated cardiomyopathy in American Cocker Spaniels with decreased plasma taurine concentration. J Vet Intern Med 11:204-211,1997

Kramer GA, Kittleson MD, Fox PR, et al: Plasma taurine concentrations in normal dogs and in dogs with heart disease J Vet Intern Med 9:253-258, 1995

Alexander JK: The heart and obesity, in Hurst JW (ed): The heart (6th ed). New York, NY, McGraw-Hill, 1986, p 1452

Boegehold MA, Kotchen TA: Relative contributions of dietary Na + and CI- to salt-sensitive hypertension. Hypertension 14.579-583, 1989

Brinson JJ, McKiernan BC: Respiratory function Jn obese dogs with chronic respiratory disease and their response to treatment. J Vet Intern Med 12:209, 1998

Cobb M, Michell AR. Plasma electrolyte concentrations in dogs receiving diuretic therapy for cardiac fatlure. J Small Anim Pract 33:526-529, 1991

Devi S, Jani RG, Anne FK and Singh RD, 2009. Study on clinical symptoms in canine cardiac diseases. Vet World, 2(8): 307-309

Devi, S., & Jani, R. G. (2009). Review on nutritional management of cardiac disorders in canines. *Veterinary World, 2*(12), 482-485.

Elizarova EP, Orlova TR, Medvedeva NV: Effects on heart membranes after taurine treatment in rabbits with congestive heart failure Arzneim Forsch/Drug Res 43:308-312, 1993

Freeman LM, Roubenoff R. Nutrition implications of cardiac cachexia. Nutr Rev 1994;52:340–347

Freeman LM, Rush JE, Kehayias JJ, et al. Nutritional alterations and the effect of fish oil supplementation in dogs with heart failure. J Vet Intern Med 1998;12:440–448

Freeman, L. M. (1998). Interventional nutrition for cardiac disease. *Clinical techniques in small animal practice*, 13(4), 232-237.

Kang JX, Leaf A: Antiarrhythmic effects of polyunsaturated fatty acids: Recent studies. Circulation 94:1774-1780, 1996

Keene BW: L-carnitine deficiency in canine dilated cardiomyopathy, in Kirk RW, Bonagura JD (eds): Current Veterinary Therapy XI. Philadelphia, PA, Saunders, 1992, p 780

Martin MWS, Johnson MJS and Celona B, 2009. Canine dilated cardiomyopathy: A retrospective study of signalment, presentation and clinical findings in 369 cases. J Small Anim Pract, 50: 23-29

O'Keefe D, Sisson DD: Serum electrolytes in dogs with congestive heart failure. J Vet Intern Med 7:118 1993

Pierpont MEM, Foker JE, Plerpont GL: Myocardial carnitine metabolism in congestive heart failure induced by incessant tachycardia. Basic Res Cardio188362-370, 1993

Pion PD, Kittleson MD, Rogers QR, Morris JG: Myocardial failure in cats associated with tow plasma taurine: A reversible cardiomyopathy. Science 237:764-768, 1987

Roudebush P, Allen TA, Kuehn NF, et al. The effect of combined therapy with captopril, furosemlde and a sodium-restricted diet on serum electrolyte concentrations and renal function ~n normal dogs and dogs with congestive heart failure. J Vet Intern Med 8:337-342, 1994

Vengsarkar SA, 1988. The diagnosis of cardiac diseases in canines. M.V.Sc. thesis, Bombay Veterinary College, Mumbai, India

Workshop on Thoracic and Abdominal Ultrasonography in Small Animals

The 5-day hands-on workshop on "Thoracic and Abdominal Ultrasonography in Small Animals" was inaugurated on 8th August 2023. Dr. Sangeeta V. Shah, Veterinary Cardiologist, was the chief guest for the inaugural function which was presided by Prof. (Dr.) S. U. Gulavane, Associate Dean, Mumbai Veterinary College. Twenty-one participants from various states of India such as Rajasthan, Kerala, Haryana and vets from different districts of Maharashtra have enrolled for the workshop. Dr. G. S. Khandekar, Professor and Head, VSR was the Director of the training programme.

Microchipping in Companion Dogs

Dr. Rashmi Gokhale, Vihang Gosavi, Divyaa Menon

Ever since I went to the University of Edinburgh to audit Applied Animal Welfare course in 2022, where I got an opportunity to visit livestock farms and teaching veterinary clinical complex of the Royal (Dick) School of Veterinary Studies, I was amazed by the way technology is used to streamline the veterinary practice in the United Kingdom. During our field visit to one of the shelters of a renowned charity Dog's Trust, I found out that it is a routine procedure to microchip companion dogs or cats up for adoption. It is the shelter's protocol to vaccinate, sterilize and microchip the abandoned dogs who have found their forever home.

Identification of companion dogs is increasingly gaining importance after the pandemic puppies' phenomena where higher incidence of purchase and abandonment of pet dogs was evident[1]. Illegal sale of puppies through social media pages was a source of income for some people during the pandemic, who were not aware of the government's rules on dog breeding and sale of pet dogs[1].

A microchip is a very small electronically coded chip, which can be safely inserted into the subcutaneous tissue of animal skin and read by a scanner[2]. Dogs used for training are micro chipped by the custom officials routinely at the Canine training centers in India. As per the Animal Quarantine and Certification rules, private veterinary practitioners microchip the pet dogs travelling from India to abroad. These days, some pet dog owners have started using microchips with GPS for their pet dogs to find them in case of loss or theft[3]. GPS collars are very costly, and the detection system requires a technical team. Its practical, uniform, and widespread use in companion dog industry will have financial limitations. A simple microchip data can be accessed only upon scanning the chip inserted in the body of a dog.

It was an instant thought that, what if each companion dog had its own ABHA number like humans of Bharat? The entire history of dog can be made available upon scanning the chip. This could be of immense help to pet theft identification, timely renewal and registration of pets, medical record keeping of dog and breeder verification before buying the pet from store. EuroPetNet is an online central microchip database of pet dogs from all European member countries. It provides owner and dog details (except contact details of owner) to the public too[4]. Keeping this in mind, I took help from a technology consultant to prepare a pilot for centralized digital system of pet dog microchipping and registration in Thane city limits. We developed a software process to connect all stakeholders (pet owners, private veterinary practitioner, municipal corporation, and data firm) on one platform with a single microchip. We also created and implemented a demonstration model at the local animal hospital Thane CPCA.

Market analysis is a must practice before launching any new product or service. So, we did a survey of 40 companion dog owners from Thane city to understand if they would like to pay for getting their companion dogs microchipped? We explained to them about microchipping procedure and its importance using a common script. The following key questions were asked to the companion owners.

Thane is a classified Smart City. Only 2/40 respondents had already microchipped their dog. 60% of respondents claimed that their dog does not have the tendency to run away. 65% of companion

Dog related	Owner related
Does your pet tend to run away?	Have you registered your pet with the local authorities?
How many times has your pet ran away?	Have you been fined by local authorities for your pet's misbehavior?
What will you do if your pet is lost?	Would you like to get your companion dog microchipped?
Are you afraid that your pet may get stolen?	Are you willing to pay a minimum of Rs. 3000/- to the vet for microchipping your dog?

dogs never ran away from their owner's house. Microchipping is perceived to be helpful for the 35% of the owners whose dog has run away once or more. 32% of the dog owners did not give any thought about the actions required in case of lost dog. Some of them were overconfident that their dog could never run away. 10% perceived going to the police as the ultimate option. Rest believed in searching for the dog on their own with the help of neighbors and local animal shelter. It is evident from the response that companion dog owners are unaware about the disaster preparedness in cases of lost/ stolen dogs[2]. Unlike humans, photographic identification of dogs is very tough and a strong identification method like microchipping is needed.

Many dog owners were fined by TMC last year for not renewing or registering their dogs under the municipal corporation as per the Animal Birth Control (Dogs) Rules, 2001. 35% of respondents of this survey had already taken license from TMC for having a companion dog, whereas 17.5% were completely unaware about any such requirement. 37.5% of respondents did not register their dogs with the local authority despite being aware of the legal requirement. This proves that attitudes of dog owners towards completing legal compliances of companion dog keeping are not satisfactory. As a private veterinary practitioner, it is our duty to make companion dog owners aware of the pet licensing obligations with the local authority. 1/14 owners who have license for keeping their dog was fined by TMC for late registration.

Even upon explaining benefits of microchipping dogs in detail, only 52.5%, that is half of the respondents were willing to get their companion dogs microchipped. 15% of the respondents felt microchipping their companion dog is not necessary and the rest were unsure about its use to the dog. 37.5% dog owners were ok to pay rupees 3000 for microchipping their companion dogs. Whereas 32% opined that they would consider microchipping their companion dog if the price is as low as rupees 2000. Only 1 from the half of the respondents came down with their dog for microchipping procedure during the camp arranged for respondents. It is strongly evident from the responses that companion dog owners are least interested in microchipping their dogs from all the stakeholders because there are no direct benefits involved for them and their dog.

The two stakeholders that are going to get benefited from microchipping of companion dogs are Local authority and private veterinary practitioner. Therefore, this exercise concludes that, unless microchipping is made mandatory by the government authority, its successful implementation is questionable. As per the Prevention of Cruelty to Animals (Pet Shop) Rules, 2018, it is mandatory to buy pet dogs from a registered pet shop/ dog breeder[6]. A scope shall be identified if a pup could be microchipped by the registered dog breeder or pet shop as a legal mandate at the time of sale to the owner. This will be a milestone in companion dog regulatory industry.

Acknowledgement:

This project was entirely funded by the Centre for Animal Population Studies (CAPS). The project ran in loss. We thank the companion dog owners who patiently responded to the survey and spared valuable time for improving the lives of companion dogs. We thank Thane CPCA for providing a platform to run the microchipping camp.

For queries related to this project, please contact capsindia@outlook.com

References:

1. The Print. 2021. Indians bit off more than they can chew: many pandemic pet dogs homeless now: https://theprint.in/features/indians-bit-off-more-than-they-can-chew-many-pandemic-pet-dogs-homeless-now/888389/
2. WSPA. Identification methods in dogs and cats.
3. Micro-chipping of pet dogs in India. https://www.pashudhanpraharee.com/microchipping-of-pets-in-india/
4. EuroPetNet. https://www.europetnet.com/
5. TOI. 29 Apr 2022. Dog owners in Thane now face penalty for not securing the license. Available at: https://timesofindia.indiatimes.com/city/thane/dog-owners-in-thane-now-face-penalty-for-not-securing-licence/articleshow/91162984.cms
6. The Prevention of Cruelty to Animals (Pet Shop Rules), 2018. Available at: http://awbi.gov.in/Document/rules

immuno

Colostrum Based Immunity Booster & Calming Formula

100 ml Liquid

Directions for Use:

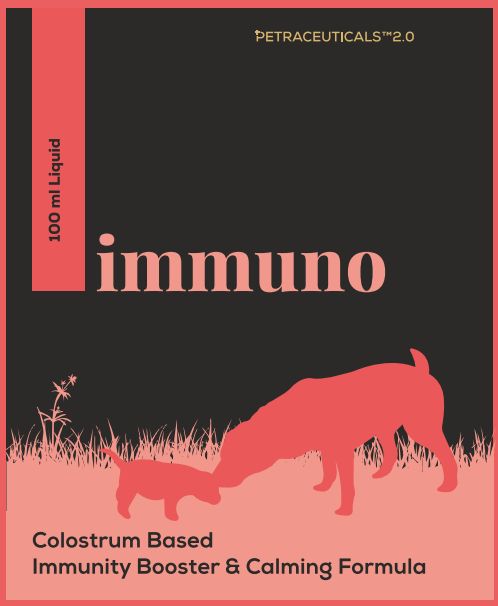
1 Serving = 4 Squirts (1.5 ml approx.)

For Puppies
Upto 5 kg: 2.5 ml
5-10 kg: 2.5 ml

For Dogs
Toy Breeds: 1 serving twice daily
Small Breeds: 2 servings thrice daily
Medium Breeds: 3 servings thrice daily
Large Breeds: 4 servings thrice daily
Giant Breeds: 56 servings thrice daily

Or as directed by the veterinarian

Spray on tongue for better absorption



Composition per Serving: 83.38 mg
Colostrum, Vitamin B_3 (Niacin), Zinc, Magnesium, Manganese, Turmeric Ext., Quercetin, Lutein, L-Theanine, Vitamin B_{12} (Methylcobalamine), Vitamin B_1 (Thiamine), Vitamin B_2 (Riboflavin), Vitamin B_6 (Pyridoxine), Vitamin B_9 (Folic Acid) &

Colostrum: The special fluid secreted by all mammals near the time of birthing. Benefits immunity, allergies, digestive health, tissue repair, recovery from illness, etc.
Quercetin: Helps reduce inflammation and allergic response like itching & redness by suppressing release of histamine in the body.
Lutein: Potent antioxidant that supports and benefits vision, joints & cardiovascular health.
L -Theanine: Has calming effect, reduces anxiety, aggression and stress.
Turmeric Extract: Contains a compound called curcumin which has antioxidant, anti-inflammatory, antiviral, antibacterial, antifungal, wound healing and anticancer benefits.

- Improves immunity
- Reduces anxiety & stress
- Reduces allergies & inflammation
- Boosts recovery from diseases
- Improves immunity

Benefits of Colostrum Supplements for Dogs

Ms. Rajas Kulkarni, BSc (Zoology) Mumbai & Veterinary Nursing (UK)
Director - Venttura BIOceuticals Pvt. Ltd.

Colostrum is the fluid produced by mammalian females during the first few days after giving birth. It is rich in antibodies, anti-ageing, immune, metabolic and other essential nutrients that are highly beneficial to young as well as adult dogs. Most supplements use Bovine Colostrum in their formulations. The best part about bovine colostrum is that it is NOT species specific. Some of the benefits of colostrum are:

Immune Function

Colostrum's immune factors, often referred to as 'bioactive components', augment resistance against pathogens. It has a positive effect on the thymus gland that translates to a balanced immune system. Some of the bioactive components are:

Immunoglobulins: Antibodies that neutralize pathogens in the lymphatic and circulatory systems. The antibodies in colostrum include IgG, IgM and IgA. Although older animals cannot absorb antibodies as young animals can, colostrum may still be able to exert a local anti-inflammatory effect in the intestinal tract when ingested.

Proline-rich polypeptides (PRP): Act to establish homeostasis (balance) in the thymus gland (master immune gland) by regulating it when underactive. This action helps to improve immune response when needed by increasing the production of T-cells, lymphocytes and other immune cells.

Growth Factors: Stimulate cell growth, help repair muscle, bone, and connective tissue. They can also heal the intestinal lining.

Thymosin: Stimulates activation, development and maintenance of the immune system.

Anti-Aging & Inflammation

There are several (87) anti-aging growth factors like Growth hormone, Epithelial growth factor, Insulin-like growth factors (IGF 1 & 2), Fibroblast growth factor and Platelet derived growth factor. They help activate cell reproduction, regeneration and repair; improve nutrient uptake, increase bone mass, restore skin elasticity, increase lean muscle and protect the body against the oxidative stress and degeneration that go along with aging.

Colostrum can help reduce inflammation due to osteoarthritis, gastrointestinal imbalances and other debilitating conditions related to injury or overuse. The PRPs in colostrum reduce inflammation by reducing the over-production of inflammatory substances in the bloodstream. Colostrum is also a rich source of MSM which is analgesic and anti-inflammatory. IGF-1 growth factor helps to support the growth of new tissue as well as repair that which has been damaged.

Autoimmune Disease & Allergies

Conditions where the immune system is hyperactive, that may benefit from colostrum include allergies, asthma, Addison's disease, inflammatory bowel disease, lupus and rheumatoid arthritis.

The substances in colostrum largely responsible for regulating an over-active immune system are the proline-rich polypeptides (PRPs). PRPs help to restore balance to the thymus gland. Because of this, they have the incredible distinction of being able to reduce the over-production of T-cells, lymphocytes and other immune factors in the same way that they increase them when immune response is impaired.

Gut Health & Intestinal Permeability Caused by NSAIDs

An unfortunate side effect of the use of NSAIDs is gastric ulceration. Research has demonstrated that when NSAIDs are provided along with colostrum supplementation, the usual gastrointestinal damage is avoided. This benefit is usually attributed to the growth factors found in colostrum that promote the reproduction, regeneration and repair of the cells lining an animal's digestive tract. Studies have also demonstrated the benefits in GI disorders like IBD, infectious diarrhoea and damage resulting from cancer therapy.

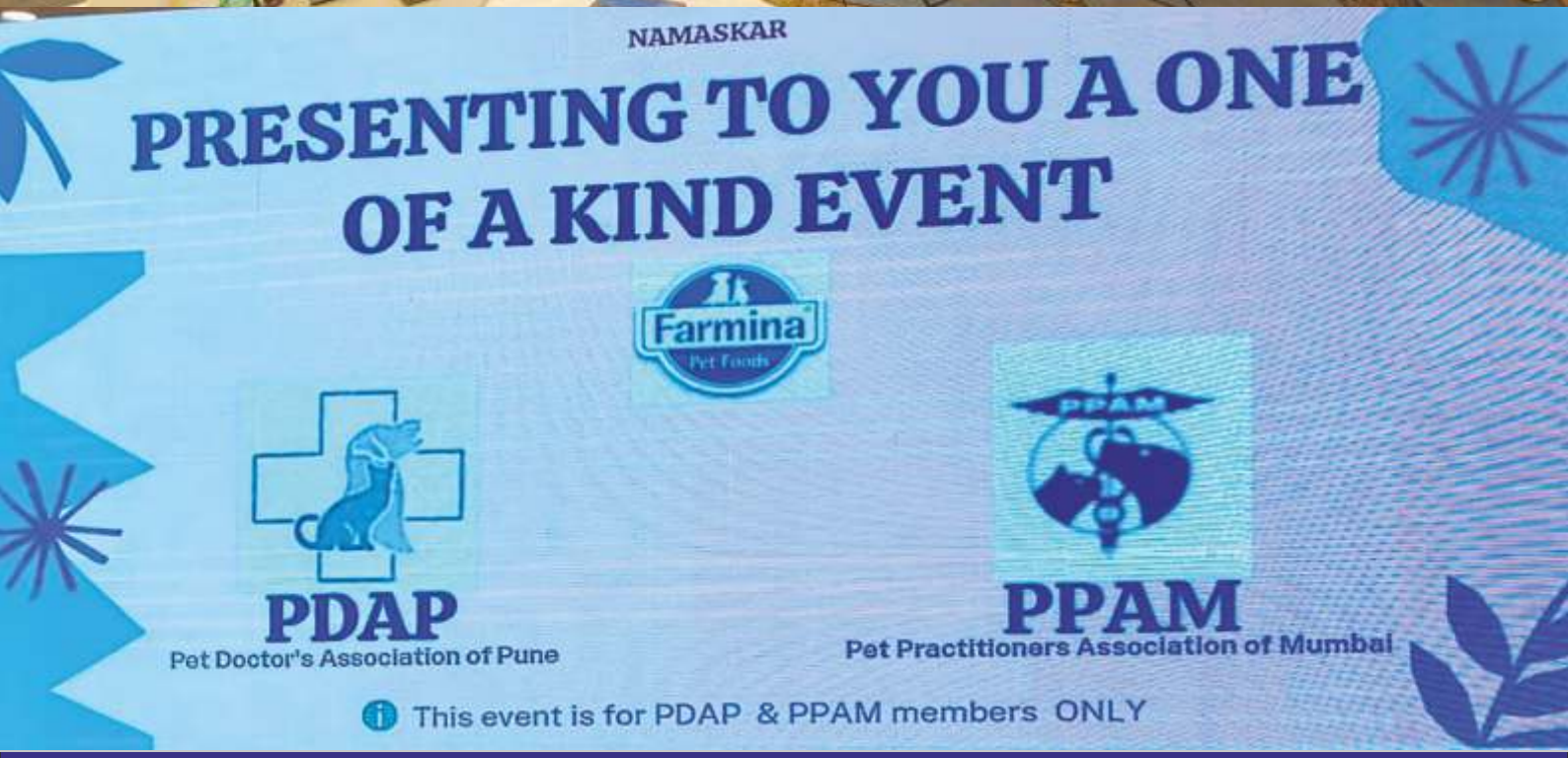
Colostrum amplifies the diversity and stability of gut microbiota enhancing general health. It improves the solidity of stools in puppies and promotes GI health.

Oral Health

Antimicrobial immunoglobulins, anti-inflammatory PRPs and IGF-1 growth factors help eliminate gum disease and help repair damaged tissue at the same time.

These are just some of the documented proven benefits of Colostrum supplementation. **Venttura Petraceuticals 2.0 Immuno+** is a sub-lingual immunity booster made with human-grade **colostrum** along with **theanine** for calming anxiety and **quercetin, turmeric extract & lutein** for antioxidant protection.

PPAM and PDAP Event held on Sunday 03.09.2023



Dr. Dhananjay Parkale

Retired Additional Commissioner Felicitated

Dr. Dhananjay Parkale (Retired) Additional Commissioner of Animal Husbandry, Maharashtra State. was felicitated for his contribution to formulating the draft of Maharashtra Goseva Ayog and the technical services being offered by him to Goshalas near Pune. The function was organized by Gau Bharat Bharati and Ekata Manch, organizations working for the development of Indigenous cows. Felicitation at the hands of Hon. Minister, Govt. of India, Shri. Parshottam Rupala ji, for seva after retirement.

Proud Moment for PPAM Members

Dr. M. L. Gatne in Malaysia

Dr. Mukulesh Gatne spoke on Canine Trypanosomosis-an emerging CVBD in Asia.

MALAYSIAN SMALL ANIMAL VETERINARY ASSOCIATION

The association thanks

MUKULESH LAXMAN GATNE

For contribution as the JUDGES at the
MSAVA BEST ORAL PRESENTATION PRIZE
MSAVA National Scientific Conference 2023

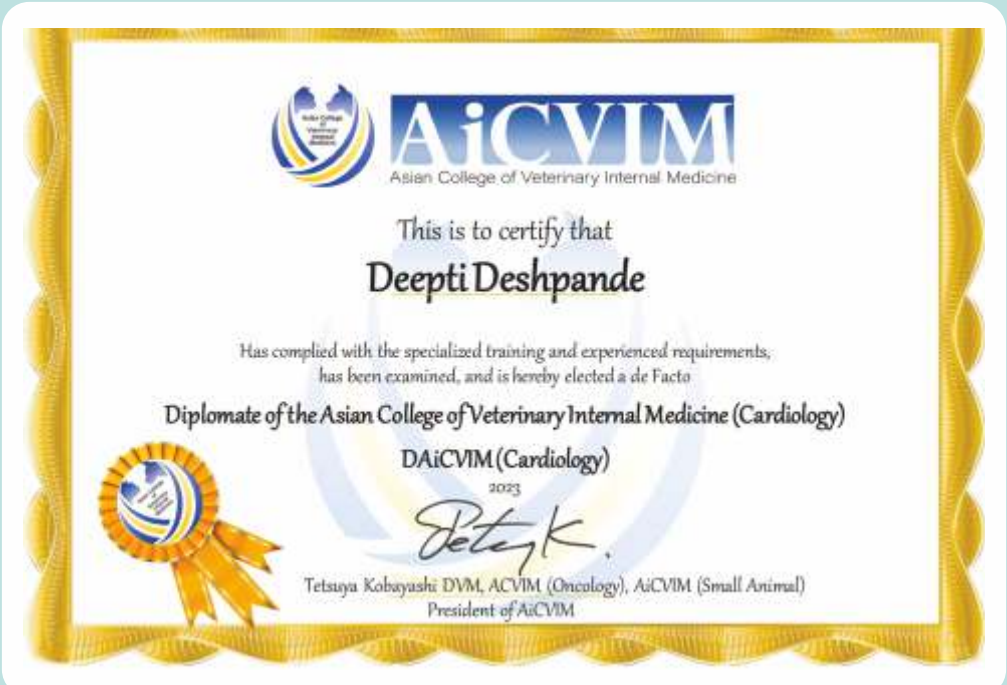
on 8TH & 9TH JULY 2023
at KUALA LUMPUR CONVENTION CENTRE, MALAYSIA

DR. AMILAN SIVAGURUNATHAN
PRESIDENT MSAVA 2021/2023

DR. GOH LAI HAR
ORGANIZING CHAIRPERSON

Dr. Deepti Deshpande

Dr. Deepti Deshpande has been chosen as a Defacto Diplomate of the Asian College of Veterinary Internal Medicine in Cardiology. PPAM family congratulates her, currently the only one in cardiology from India.



AiCVIM
Asian College of Veterinary Internal Medicine

This is to certify that

Deepti Deshpande

Has complied with the specialized training and experienced requirements,
has been examined, and is hereby elected a de Facto

Diplomate of the Asian College of Veterinary Internal Medicine (Cardiology)

DAiCVIM (Cardiology)

2023

Tetsuya Kobayashi DVM, ACVIM (Oncology), AiCVIM (Small Animal)
President of AiCVIM

Dr. Sangeeta Vengsarkar Shah
at National Symposium on Canine Cardiology at Bhubaneshwar on 13.07.2023

Topic: Staging and Management of Chronic Myxomatous Valve Disease (CMVD) Nutrition and Supplement in Heart Disease.

Dr. Milind Hatekar CE
in Guwahati, Assam

Dr. Dhananjay Bapat

PPAM President Dr. Dhananjay Bapat met Hon Union health minister of State Dr. S.P. Singh Baghel in New Delhi.

Dr. Shriniwas V. Vishwasrao

Dr. Shriniwas V. Vishwasrao delivered a talk on Osteoarthritis in Pets, its Diagnosis, Treatment and Management in Solapur on Sunday 27.08.2023. Large number of Veterinarians participated in the CE program. It was sponsored by Tossvet Pharmaceuticals India Pvt. Ltd., Solapur.

List of Speakers in alphabetical order with Lecture Topics for FASAVA 2023, Mumbai.

Sr. No.	Name of Speaker	Lecture Title
1.	**Adarsh Kumar** (Palampur, India) 	1. Rudiments of Equine abdominal and thoracic sonography. 2. Protocols and procedures of Equine general anaesthesia.
2.	**Amrita Deb** (Mumbai, India) 	1. Clinical cases in exotic animal medicine.
3.	**Angela M. Lennox** (USA) 	1. Critical care of exotic companion mammals. 2. Alternatives to elective Alterin in exotic companion mammals. 3. Rabbit and rodent densitry. 4. Multimodal anesthesia and analgesia in exotic companion mammals. 5. Multimodal analgesia in birds. 6. Rabbit gastrointestinal syndrome in rabbits. 7. Respiratory problems in exotic companion mammals. 8. Reproductive problems in Birds.
4.	**A. U. Bhikane** (Nagpur, India) 	1. Advances in Diagnosis and Treatment of Production. Diseases in Dairy Animals. (A. U. Bhikane) 2. Differential Diagnosis of Red Urine with Special Reference to Blood Transfusion Therapy. (A. U. Bhikane and R. K. Jadhav)
5.	**B. Nagarajan** (Chennai, India) 	1. Approach to alopecia in dogs. 2. Common allergens for canine allergic dermatitis in India.

List of Speakers in alphabetical order with Lecture Topics for FASAVA 2023, Mumbai.

Sr. No.	Name of Speaker	Lecture Title
6.	**Cathy Beck** (Australia) 	1. Thoracic Radiology: positioning and principles. 2. Thoracic radiology: the pulmonary parenchyma. 3. Thoracic Radiology: the pleural space and mediastinum. 4. Thoracic Radiology: the cardiovascular structures. 5. Abdominal imaging: which modality should I use? 6. Abdominal Radiology: the gastrointestinal tract. 7. Musculoskeletal radiology principles and positioning. 8. Introduction to CT and MRI.
7.	**Dayaram Suryavanshi** (India) 	1. Lumpy skin disease in and out. 2. Post mortem examination in sheep and goats.
8.	**Deepti Deshpande** (Mumbai, India) 	1. Troubleshooting anaesthetic complications. 2. Anaesthesia in cardiac diseases.
9.	**Elisa M. Mazzaferro** (USA) 	1. Fluid therapy: it's more than just lactated ringers. 2. Hypoadrenocorticism: Insidious and Deadly. 3. Diagnosis and Management of Diabetic Ketoacidosis. 4. Emergency Management of Spinal Trauma and Traumatic Brain Injury. 5. Nutritional support in the critical patient. 6. Kirby's rule of twenty monitoring for critical illness. 7. Emergency and long-term management of IMHA. 8. Canine Parvoviral Enteritis: What's New.
10.	**Felisbina Luisa Pereira Queiroga** (Portugal) 	1. Initial clinical evaluation of the cancer patient. 2. Practical aspects of high-dose chemotherapy. 3. Metronomic chemotherapy: principles and clinical applications. 4. Mast cell tumor in dogs: Diagnosis and treatment. 5. Key aspects of canine mammary tumors diagnosis and treatment. 6. Feline mammary tumours: cats are not small dogs. 7. Canine Transmissible Venereal Tumour: Diagnosis and Treatment. 8. Communication in Oncology: How to deliver bad news.
11.	**G. S. Khandekar** (Mumbai, India) 	1. An overview of the recent developments in minimal invasive surgery in small animal practice. (Dr. S. D. Tripathi and Dr. G. S. Khandekar)

List of Speakers in alphabetical order with Lecture Topics for FASAVA 2023, Mumbai.

Sr. No.	Name of Speaker	Lecture Title
12.	**Han Hock Siew** (Singapore) 	1. Three Skin diseases you must know if you are practicing in Asia Part I: Feline Lynxacariosis. 2. Three skin diseases you must know if you are practicing in Asia Part II: Cutaneous Myiasis. 3. Three skin diseases you must know if you are practicing in Asia Part III: Feline Sporotrichosis. 4. Antimicrobial therapy from the perspective of a veterinary dermatologist. 5. Dermatophytosis: clinical signs, diagnosis and therapy. 6. Food for thought: Contentious topics in veterinary food allergies.
13.	**Joerg M. Steiner** (USA) 	1. Chronic diarrhea in dogs and cats – basic work-up. 2. Chronic diarrhea in dogs and cats – advanced work-up and management. 3. Intestinal dysbiosis – diagnosis and management. 4. Diagnosis of pancreatitis in small animals. 5. Management of pancreatitis in small animals. 6. Exocrine pancreatic insufficiency. 7. Diagnostics … for liver disease. 8. Chronic liver disease in small animals.
14.	**Julia A. Beatty** (Hong Kong) 	1. Feline retrovirus infections in 2023: diagnosis and management. 2. How I approach the cat with breathing difficulties. 3. Chronic sneezing and nasal discharge in the cat.
15.	**K. Jeyaraja** (Tamil Nadu, India) 	1. Exploring the role of ultrasound in internal medicine. (Two lectures)
16.	**K. VinodKumar** (Thrissur, India) 	1. Therapeutic Management of Emerging Infectious Diseases of Cats. 2. Diagnosis and Management of Viral infections in cats.
17.	**Kaustubh Garud** (Mumbai, India) 	1. Practical applications of SDMA. 2. Calium and phosphorous homeostasis in kidney patients.

List of Speakers in alphabetical order with Lecture Topics for FASAVA 2023, Mumbai.

Sr. No.	Name of Speaker	Lecture Title
18.	**Khursheed Mama** (USA) 	1. Sedation Protocols for Dogs and Cats. 2. Use of opioids and alternatives in small animal practice. 3. Breed Related Anesthesia Considerations. 4. Cardiovascular Monitoring. 5. Cardiovascular Support - inotropes and vasopressors. 6. A case-based approach to fluid, acid-base and electrolyte therapy during anesthesia. 7. Anesthesia Ventilation and ventilators. 8. Selected loco-regional anesthesia techniques.
19.	**Laura E. Selmic** (USA) 	1. GDV surgery and management. 2. Advanced concepts small intestinal surgery. 3. Mastering thyroid and parathyroid surgery. 4. Introduction to local and axial pattern flaps. 5. Pain in the butt: surgery for perianal masses. 6. Tips and tricks: abdominal explore and splenectomy. 7. Urinary tract surgery foundations. 8. Oral tumor management: Appropriate case selection for surgery vs. radiation. (Combined with Dr. Noopur Desai)
20.	**Matthias Frank** (Germany) 	1. Degenerative Joint Disease (DJD) in small animals: Diagnosis and old and new treatment options. 2. Cats are not just small dogs: differences in feline traumatology and orthopaedics. 3. Intervertebral Disc Disease: From diagnosis to treatment. 4. My dog is lame: is it Neuro or Ortho? 5. Spinal fractures in small animals: from diagnosis to treatment.
21.	**Meg Sleeper** (USA) 	1. Stagewise management of heart disease. 2. Feline thromboembolic disease. 3. Dilated cardiomyopathies update. 4. Treatment of CCF in dogs and cats. 5. Interventional cardiology in small animals. 6. Feline Cardiomyopathies. 7. Arrhythmias Part I. 8. Arrhythmias Part II.
22.	**Mukulesh L. Gatne** (Mumbai, India) 	1. Canine Trypanosomiasis – Asian scenario. 2. Tick-Talk.
23.	**N. M. Markandeya** (Nagpur, India) 	1. Monitoring and regularization of oestrus cycles in dairy animals. 2. Strategies to improve conception rate in field cases.

List of Speakers in alphabetical order with Lecture Topics for FASAVA 2023, Mumbai.

Sr. No.	Name of Speaker		Lecture Title
24.	**Nihar Jayakar** (Mumbai, India)		1. Computed Tomography (CT) scan in Exotic Animals.
25.	**Noopur Desai** (Mumbai, India)		1. Basic pitfalls in the diagnosis and treatment of cancer and how to prevent them. 2. Oral tumor case management: Appropriate case selection for surgery vs. radiation. (Combined lecture with Laura Selmic)
26.	**Paulo Steagall** (Hong Kong)		1. The Feline Grimace scale: a tool for acute pain assessment for your clinic. 2. Easy and practical pain assessment in small animal practice.
27.	**P. Sridevi** (Chennai, India)		1. An approach to reducing neonatal mortality in dogs. 2. Subfertility in the male: A diagnostic approach. 3. Diagnosing and managing canine dystocia.
28.	**Phiroz Khambatta** (Pune, India)		1. Radiology and its interpretation in lameness in horses. 2. A Rational approach to forelimb lameness in horses.
29.	**Rajendra Dhumal** (Mumbai, India)		1. Management of Equine Colic.
30.	**Raphael Ziv**		1. Study for the reduction of premises Rhipicephalus Sanguineus infestation 2. Babesia prevention

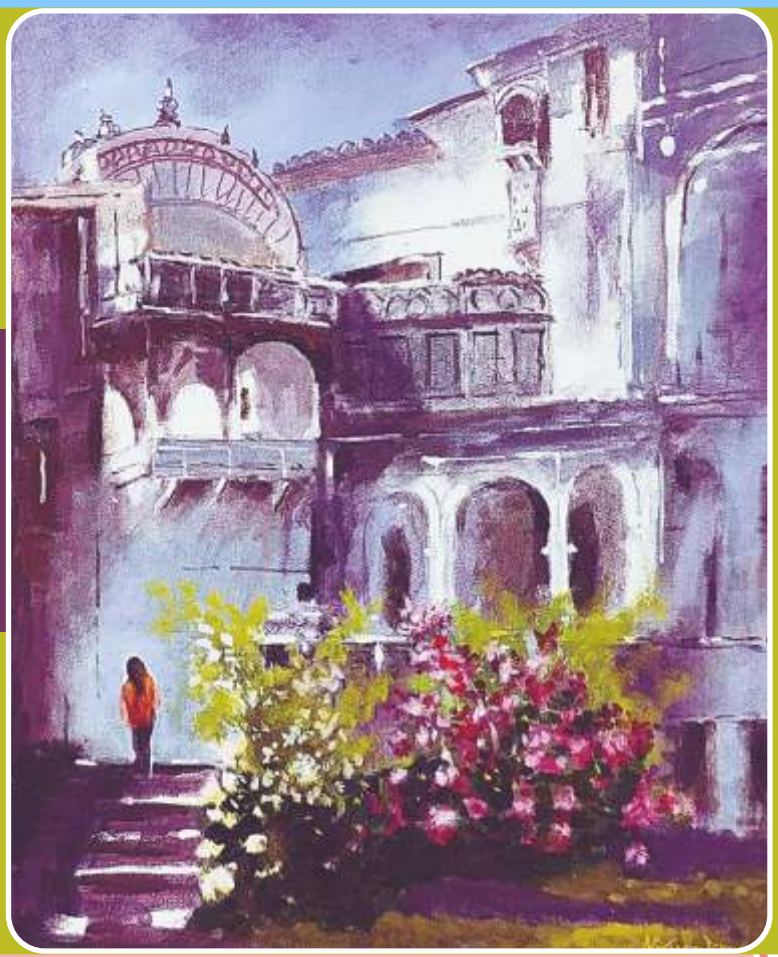
List of Speakers in alphabetical order with Lecture Topics for FASAVA 2023, Mumbai.

Sr. No.	Name of Speaker	Lecture Title
31.	**Rebecca Justine Traub** (Australia) 	1. Update on the epidemiology of canine vector-borne diseases in Asia. 2. Diagnosis of canine vector-borne diseases - not as simple as they seem. 3. Crucial considerations for the treatment and control of canine vector-borne diseases in the tropics. 4. Feline vector-borne diseases - opening the black box. 5. Canine and feline lymphatic and subcutaneous filariasis - what are our concerns? 6. Canine and feline heartworm disease - same agent, different agendas.
32.	**S. D. Tripathi** (Mumbai, India) 	1. An overview of the recent developments in minimal invasive surgery in small animal practice.
33.	**S. P. Tyagi** (Palampur, India) 	1. Corneal ulcers in dogs; the diagnostic and therapeutic strategies. 2. Brachycephalic ocular syndrome in dogs; a clinical overview.
34.	**Sangeeta Vengsarkar Shah** (Mumbai, India) 	1. Systemic hypertension. 2. Chronic cough-is it the heart or the lungs?
35.	**Sarita Kelkar** (Mumbai, India) 	1. Reproductive ultrasound in companion animals.
36.	**Shailesh G Pethe** (Mumbai, India) 	1. Care and management of big cat neonates. 2. Rescue and conflict mitigation of urban wildlife.
37.	**Shirish Upadhye** (Nagpur, India) 	1. Foreign body syndrome in Bovine. 2. Diaphragmatic hernias in Bovine.

List of Speakers in alphabetical order with Lecture Topics for FASAVA 2023, Mumbai.

Sr. No.	Name of Speaker	Lecture Title
38.	**Shrikrishna Isloor** (Bangalore, India) 	1. Rabies - A zoonotic threat in south Asia. 2. Capacity building in South Asia for elimination of dog mediated rabies by 2030.
39.	**Shriniwas V. Vishwasrao** (Mumbai, India) 	1. Bone Tumour in Dogs? Pick it up early on a simple radiograph. 2. Large Wounds in Dogs. Attempt skin grafting in your practice.
40.	**Takuo Ishida** (Japan) 	1. Fine needle biopsy and cytological evaluation of lesions in the skin. 2. Ultrasound-guided biopsy and cytological evaluation of thoracic and abdominal cavity lesions.
41.	**Vellayan Subramaniam** (Malaysia) 	1. Retrospective Study on the Isolation of Foreign Bodies from Gastrointestinal Tract in Exotic Pets in an Exotic Animal Clinic in Kuala Lumpur: A 8-year study. 2. Potassium Permanganate a “HOLY DRUG” in Veterinary Medicine: It's usage in Reptiles.

Acrylic Colour
Canvas Painting by
Dr. Kishor Batwe,
PPAM Member



Nutritional Interventions for Hepatic Health and Disease Management: A Review

Dr. Jadhav Aditya Sudhir
MVSc (Animal Nutrition), Product Executive, Drools Pet Food Pvt. Ltd.

1. Introduction:

A Healthy Liver, the Cornerstone of Lifelong Vitality." A healthy liver ensures the well-being of the entire body through vital metabolic functions. Common liver diseases in companion animals include acute or chronic hepatitis, cholangitis, vascular anomalies, toxicosis, hepatic lipidosis, and neoplasia. The liver provides many essential functions, including synthesis and metabolism of carbohydrates, fats, and proteins. Therefore, liver disease can potentially affect metabolism and utilization of all macro- and micronutrients. Treatment of liver disease requires a multimodal approach, which can include medications, surgery, supplements, and dietary modification. Goals of nutritional management are centered on the avoidance of overwhelming the remaining metabolic capacities of the damaged liver and prevention of clinical signs such as hepatic encephalopathy (HE) while providing sufficient nutrients for regeneration. (Norton et al., 2016)

2. Causes:

<table>
<tr><th></th><th>Acute liver disorders</th><th></th><th>Chronic liver disorders</th></tr>
<tr><td>Hepatotoxins</td><td>1. drugs and anaesthetic – paracetamol, mebendazole, ketoconazole, sulphonamides
2. Chemicals (heavy metals like copper, iron, lead)
3. Biological toxins (algatoxins, mycotoxins)</td><td>Inflammatory</td><td>1. Copper storage hepatitis
2. Leptospira associated hepatitis
3. Drugs (primidone, phenytoin)
4. Metabolic (alpha-1-trypsin deficiency)</td></tr>
<tr><td>Infectious</td><td>1. Viral (infectious canine hepatitis, herpes virus)
2. Bacterial (leptospirosis)
3. Protozoal (toxoplasmosis)</td><td rowspan="3">Non inflammatory</td><td rowspan="3">1. Circulatory (portosystemic shunts, arteriovenous shunts)
2. Neoplaisa
3. Nodular hyperplasia
4. Hepatic lipidosis (obesity, diabetes mellitus)
5. Other (hepatic cyst, amyloidosis)</td></tr>
<tr><td>Systemic or metabolic disorders</td><td>Acute pancreatitis
Acute haemolytic anaemia</td></tr>
<tr><td>Traumatic or hypoxic injury</td><td>Abnormal trauma
Liver lobe torsion
Severe hypotention/hypoxia</td></tr>
</table>

(Rutgers, C., 1996)

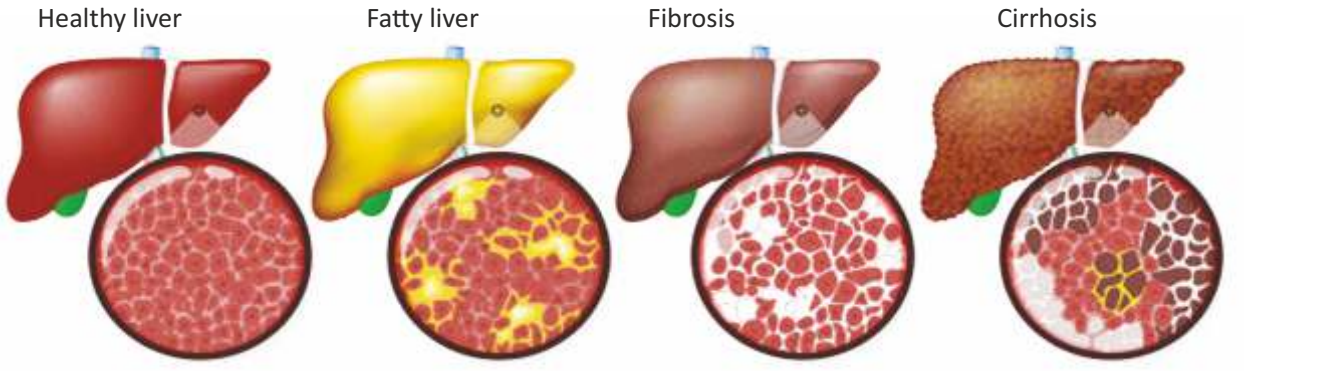
3. Clinical signs:

The clinical spectrum of primary liver disease may range from occult chronic disease to fulminant acute liver failure, but the absence of clinical signs does not rule out liver disease. The liver has a large functional reserve capacity and development of clinical signs implies marked diffuse impairment of liver function. Even then clinical signs are often vague. No single sign is diagnostic of liver disease, and even the more specific signs such jaundice and ascites can also be associated with other disorders such as hemolysis or congestive heart failure. Signs may be acute or chronic and in the letter case they are frequently intermittent. However, chronic hepatic disease can also be associated with acute onset of clinical signs once the liver's large reserve capacity has been surpassed. On physical examination, jaundice, hepatomegaly and ascites are the only abnormalities that may point toward an underlying liver problems.

Clinical signs of liver disease in the dog	
Nonspecific signs	**Signs suggest of liver disease**
Depression	Jaundice
Anorexia	Ascites
Weight loss	Hepatic encephalopathy
Vomiting/ diarrhea	Hepatomegaly or decreased liver size
Polyuria/ polydipsia	Drug intolerance
Pigmented urine	Coagulopathy

(Rutgers, C., 1996)

4. Stages of liver disease:



5. Nutritional management in hepatic disorders:

A. Protein

The liver's role in protein metabolism includes synthesis of albumin, globulins, ceruplasmin, ferritin, numerous serum enzymes and coagulation factors. Additionally the liver regulates amino acid metabolism, is involved in the detoxification of ammonia and is responsible for the subsequent synthesis of urea. Therefore, dietary protein concentrations should not be decreased in early liver disease, as protein restriction may cause catabolism of endogenous lean body mass, resulting in increased ammonia production and increased risk of hepatic encephalopathy (Biourge, 1997; LaFlamme, 2000). Consequently, providing a diet with modestly increased protein content from high quality protein is essential in the management of chronic hepatopathies. If a reduced protein-content diet is necessary, the diet should contain no less than 2.1g protein/kg body weight for dogs. (Center, 1998; LaFlamme, 2000).

B. Calories

Calories derived from fat increase the palatability of foods, which is beneficial in an otherwise inappetant patient and also helps prevent endogeneous protein catabolism. However, the fat content of foods should be limited in patients with potential cholelithiasis or cholestasis. Dietary fats stimulate cholecystokinin and motilin release from the duodenum, signalling contraction of the gall bladder which can be potentially detrimental in cases of bile duct obstruction (Center, 2009). Limiting fat intake in these patients may be necessary as lipid metabolism is compromised in hepatobiliary disease and long chain triglyceride digestion may decrease by as much as 30–50%. Thus, feeding excessive fat could contribute to diarrhea and lead to further nutrient depletion (LaFlamme, 2000).

C. Copper

Abnormal hepatic copper concentrations are often observed as a pathologic feature in hepatic disease. High copper concentration may be secondary to cholestatic liver disease or may be the result of a primary defect in hepatic copper excretion. Breeds associated with primary copper-associated hepatopathies include Skye terriers, West Highland white terriers, Doberman pinschers, Labrador retrievers and Bedlington terriers. Management of high hepatic copper concentrations will decrease hepatic mitochondrial damage and lipid

peroxidation in hepatocytes (Sokol et al., 1989). Treatment has traditionally included decreasing total dietary copper content, increasing dietary zinc content, and chelation therapy (Hoffmann et al., 2009). Another goal with nutritional treatment of liver disease in early cirrhosis or triaditis is protection of the hepatocyte from apoptosis and fibrosis.

D. Polyenylphosphatidylcholine

Polyenylphosphatidylcholine (PEP), is a compound made up of polyunsaturated phospholipids which work as antioxidants and collagenase stimulators to decrease hepatic fibrosis (Aleynik et al., 1997). PEP may also diminish oxidative mitochondrial and hepatocellular membrane injury by decreasing reactive oxygen species (ROS) generation thereby conserving hepatocyte glutathione (GSH), a potent endogenous antioxidant.

E. S-adenosylmethionine

S-adenosylmethionine (SAMe) is made and utilized in hepatocytes for methylation reactions. Benefits of SAMe treatment in hepatic disorders include: decreased rate of liver disease progression, increased hepatic GSH stores, improved tolerance of free radicals and improvement of cholestatis and reperfusion injury and potentially improved regeneration and protein synthesis. Glutathione depletion has been observed in a variety of hepatopathies, making the use of SAMe a standard therapeutic intervention.The recommended dosage in dogs for cirrhosis (and hepatic lipidosis) is 17–20 mg/kg PO given on an empty stomach (Center, 2004; Center et al., 2005).

SAMe may be used in the late stage cirrhotic and shunt patient as it plays a role in restoration of glutathione levels and is thus important in detoxification mechanisms of hepatocytes (Center et al., 2005). However, SAMe does provide an additional source of the amino acid methionine which can lead to hepatic encephalopathy and it should be used with caution in severe cases when hepatic encephalopathy is likely (Center, 2004). In chronic liver disease antioxidant therapies such as PEP, vitamin E, silamarin, SAMe and ursodiol are often used for early hepatic disease.

F. Vitamin E

Vitamin E has also been used as adjunct therapy in early hepatic disorders. Vitamin E protects all cell membranes from lipid peroxidation and may suppress inflammatory cell activity and reduce free radical damage to hepatocytes. Vitamin E also has anti-proliferative effects on vascular smooth muscle and suppresses hepatic collagen gene expression in the inflamed or injured liver (Chojkier et al., 1998; Center, 2004). Supplementation during hepatic disease is warranted not only due to the anti-inflammatory benefits, but also because hepatic concentrations of alpha-tocopherol in patients with cirrhosis have been found to be three-fold lower than in control levels, even despite normal serum concentrations (Von Herbay et al., 1994).

G. Silymarin

Silymarin is a complex of flavinolignans which are derived from milk thistle and include silybinin (or silybin), isosilibinin, silidianin and silicristin. Silymarin's mechanisms of action include providing antioxidant effects against relevant ROS and lipid peroxidation (Center, 2004.) Silymarin also accelerates hepatocellular regeneration as a result of increased gene transcription and translation and enhanced DNA biosynthesis. Inhibition of stellate cell activation and proliferation as well as signalling for type I collagen synthesis and production of metaloproteinase I tissue inhibitor may mitigate fibrosis. Silymarin may also induce a choleretic response associated with expansion of the endogenous pool of bile salts including the hepatoprotective bile acid urosodeoxycholic acid (Center, 2004). Although there are no studies on dogs, a dose of 50–150mg/kg is safe in dogs (Center, 2004).

H. Ursodeoxycholic acid

Ursodeoxycholic acid (Ursodiol) is a non-toxic hydrophilic dihydroxylated bile acid which was first identified in the gall bladder of Chinese Black Bear. Benefits of Ursodiol include: displacement of toxic bile acids with this less toxic form of bile acid, cytoprotection of hepatocytes and biliary epithelium, antioxidant effects, immunomodulatory effects, attenuation of bile acid secretion, enhanced biliary elimination of toxic substances and an inhibitory influence on fibrogenesis. It is used in the treatment of cirrhosis, cholangitis and non-obstructive forms of cholestasis (Kumar and Tandon, 2001).

I. L-carnitine

L-carnitine is involved in the transport of fatty acids into the mitochondria, where they are used as a source of energy. This can be beneficial in hepatic dogs because it may help reduces risk of fat accumulation in the liver, which is a common issue in hepatic dogs. L-carnitine also has antioxidant properties that can help reduce oxidative stress in the liver, which is often increased in dogs with liver disease.

J. Vitamin B

Water-soluble B vitamins are supplemented in liver disease as vitamin B12, folate, riboflavin, nicotinamide, thiamine, pantothenic acid and pyridoxine are stored in the liver. Availability and storage patterns are altered with hepatic disease (Biourge, 1997). Vit. B complex, twice maintenance requirements recommended in severe cases of cirrhosis. (Center, 1998).

K. Vitamin K

Vitamin K may be depleted in some forms of hepatic disease due to impaired hepatic synthesis, high turnover rate of clotting factors (i.e., consumptive coagulopathy) or the concurrent use of antibiotics which may cause a decrease in vitamin K producing bacteria in the intestine or interfere with hepatic enzymes which synthesize clotting factors (Peetermans and Verbist, 1990). So Vitamin K should be supplemented in hepatic diseases.

L. Fibres

The use of lactulose and soluble fibres, such as pectin, psyllium and inulin, reduces ammonia absorption from the colon and help prevent hepatic encephalopathy. Increased amounts of fermentable fiber encourage growth of acidophilic bacteria, such as Lactobacillus, which are less ammoniagenic and will reduce the pH of the colon (Crossley and Williams, 1984; Center, 1998). This decrease in pH causes a shift of ammonia to its ionic form (NH4+) which is not absorbed from the gut and is excreted in the feces (Center 1998).

6. Selected supplements in liver diseases for dogs:

Supplements	Benfits	Condition	Recommended dose
Vitamin E	Antioxidants	General liver disease	50-400 IU/day
Vitamin C	Antioxidants, involved in production of L-carnitine and in conversion of oxidized tocopherol (vitamin E) to active site	General liver disease, avoid in copper storage disease	500-1000 IU/day
L-carnitine	Assist in uptake of fatty acids into mitochondria	Hepatic lipidosis	-
Zinc	Reduces liver copper accumulation and fibrosis; provides membrane stabilization, free radicle scavenger, antioxidants, modulation of CYP450	Copper storage disease, general liver disease	Copper storage disease- 15mg/kg/day, general supplementation- 1 to 3mg/kg/day
SAMe	Glutathione precursor, antioxidants via hepatic glutathione	Chronic hepatitis, hepatic lipidosis, cholangiohepatitis, Heinz body anemia	20 mg/kg/day
Silymarin	Ameliorates hepatic injury, reduction of ALT and AST, free radicle scavenger, antioxidants	Toxin exposure, +/- hepatocellular necrosis	50-250/day

*Not all supplements are safe for all patient

*ALT:- Alanine transaminase , AST:- Aspartate transaminase, SAMe:- S-adenosylmethionine.

7. Conclusion:

Nutritional management of hepatic diseases is often considered a primary therapeutic intervention. Manipulation of macronutrients such as protein and fiber plays an integral role in controlling hepatic encephalopathy, while the fat content of a diet plays an important role in management of obstructive cholangiohepatopathies. Minerals such as iron and copper can cause serious hepatic damage, while others such as zinc are considered therapeutic in some cases. Antioxidants appear to play a role in reversing membrane peroxidation damage and collagenase activity, effectively reducing fibrosis. Supplementation of hepatic-dependent micronutrients also prevents depletion, preventing systemic consequences. Regardless of what hepatopathy is present, nutritional intervention can be used to improve the clinical signs and potentially recovery.

8. Reference:

Aleynik, S.I., Leo, M.A., Ma, X., Aleynik, M.K. and Lieber, C.S., 1997. Polyenylphosphatidylcholine prevents carbon tetrachloride-induced lipid peroxidation while it attenuates liver fibrosis. Journal of hepatology, 27(3), pp.554-561.

Biourge, V.C., 1997, February. Nutrition and liver disease. In Seminars in Veterinary Medicine and Surgery (Small animal) (Vol. 12, No. 1, pp. 34-44).

Center, S.A., 1998. Nutritional support for dogs and cats with hepatobiliary disease. The Journal of nutrition, 128(12), pp.2733S-2746S.

Center, S.A., 2004. Metabolic, antioxidant, nutraceutical, probiotic, and herbal therapies relating to the management of hepatobiliary disorders. Veterinary Clinics: Small Animal Practice, 34(1), pp.67-172.

Center, S.A., 2009. Diseases of the gallbladder and biliary tree. Veterinary Clinics: Small Animal Practice, 39(3), pp.543-598.

Center, S.A., Randolph, J.F., Warner, K.L., McCabe-McClelland, J., Foureman, P., Hoffmann, W.E. and Erb, H.N., 2005. The effects of S-adenosylmethionine on clinical pathology and redox potential in the red blood cell, liver, and bile of clinically normal cats. Journal of veterinary internal medicine, 19(3), pp.303-314.

Chojkier, M., Houglum, K., Lee, K.S. and Buck, M., 1998. Long-and short-termd-α-tocopherol supplementation inhibits liver collagen α1 (I) gene expression. American Journal of Physiology-Gastrointestinal and Liver Physiology, 275(6), pp.G1480-G1485.

Crossley, I.R. and Williams, R., 1984. Progress in the treatment of chronic portasystemic encephalopathy. Gut, 25(1), p.85.

Hoffmann, G., Jones, P.G., Biourge, V., Van Den Ingh, T.S.G.A.M., Mesu, S.J., Bode, P. and Rothuizen, J., 2009. Dietary management of hepatic copper accumulation in Labrador Retrievers. Journal of veterinary internal medicine, 23(5), pp.957-963.

Kumar, D. and Tandon, R.K., 2001. Use of ursodeoxycholic acid in liver diseases. Journal of Gastroenterology and Hepatology, 16(1), pp.3-14.

LaFlamme, D.P., 2000, Nutritional management of liver disease. In Kirk's Current Veterinary Therapy XIII: Small Animal Practice. (ed. J.D. Bonagura) Saunders, Philadelphia, pp. 693–697.

Norton, R.D., Lenox, C.E., Manino, P. and Vulgamott, J.C., 2016. Nutritional considerations for dogs and cats with liver disease. Journal of the American Animal Hospital Association, 52(1), pp.1-7.

Peetermans, W. and Verbist, L., 1990. Coagulation disorders caused by cephalosporins containing methylthiotetrazole side chains. Acta Clinica Belgica, 45(5), pp.327-333.

Rutgers, C., 1996. Liver disease in dogs. In Practice, 18(9), pp.433-444.

Sokol, R.J., Devereaux, M.W., Traber, M.G. and Shikes, R.H., 1989. Copper toxicity and lipid peroxidation in isolated rat hepatocytes: effect of vitamin E. Pediatric research, 25(1), pp.55-62.

Von Herbay, A., de Groot, H., Hegi, U., Stremmel, W., Strohmeyer, G. and Sies, H., 1994. Low vitamin E content in plasma of patients with alcoholic liver disease, hemochromatosis and Wilson's disease. Journal of hepatology, 20(1), pp.41-46.

VET-PRO®

Specially Formulated by Experienced Veterinarians
& Animal Experts in the US

drools®
Feed Real. Feed Clean.

VET-PRO HEPATIC (Gravy)

- **HIGH QUALITY PROTEIN HELPS TO SUPPORT LIVER FUNCTION**
- **OMEGA 3 FATTY ACID ACT AS ANTIINFLAMMATORY**
- **LOW LEVEL OF COPPER-PROTECT THE LIVER FROM EXCESS BUILDUP**
- **HIGH GLYCEMIC CARBOHYDRATE-ENERGY INTAKE TO MEET THE NEED WITHOUT OVERLOADING THE STOMACH**
- **NO CORN, WHEAT OR SOYA**

SCAN TO KNOW MORE

FASAVA 2023 - REGISTRATION PACKAGE

NON RESIDENTIAL PACKAGE (WITHOUT ACCOMMODATION)

RESIDENTIAL PACKAGE 2 NIGHTS - 3 DAYS (WITH ACCOMMODATION)

National

Categories	Late Registration From 3rd October to 26th October 2023	Spot 27th October 2023
PPAM and FSAPAI and FASAVA Affiliated Association Members in India	**INR 28,000**	**INR 30,000**
Non Member from India	**INR 41,000**	**INR 51,000**
FASAVA / WSAVA - member association (From Region)	**INR 28,000**	**INR 31,000**
VET Student	**INR 21,000**	**INR 23,000**
Accompanying Persons	**INR 25,000**	**INR 25,000**

BANK DETAILS:

Beneficiary Name:
Pet Practioners Association

Credit Account No.: 744946564

Bank: Indian Bank

Account Type: Savings

IFSC Code: IDIB000S010

PAN NUMBER: AAATP330L

GST NO: 27AAATP3330L1ZI

Non-residential package includes:

- Conference Registration Fees.
- Conference Lunches on 27th, 28th & 29th October 2023 (Friday to Sunday).
- Welcome Dinner on 27th October, 2023.
- Banquet Dinner on 28th October, 2023.
- Taxes are included.
- Visit to Trade Area.

Note:

- All accommodations are on Single or Twin sharing basis. Registration is neither refundable nor transferrable.
- Limited accommodation rooms available. Organizing committee will not be responsible for any loss or damages.
- Children less than 3 years old will not charge for entry and registration. Spouse/family members are not allowed to enter the lecture halls.
- PPAM Committees will not be responsible for any loss/damage.

Please note:

- No pick up drops from Airport, railways station or bus stand.
- The Hotel check in time is 15.00 hrs and check out time is 12.00 Noon.
- Early check in & late check-out is strictly subject to availability.
- Internet, Mini Bar, Room service, laundry and telephones etc will be settled by the guest at the time of check out.
- You are requested to carry a photo ID proof required by the hotel at the time of check in.

CANCELLATION POLICY:

Once Registered, the amount will be Non Refundable.

BOOK-POST

If not delivered, please return to
The Secretary, PPAM. Shop No. 1,
Bramhandev CHS, Padmabai Thakkar Road,
Shivaji Park, Mahim, Mumbai 400 016.

Official Add : Shop No 1, Bramhandev CHS,
Padmabai Thakkar Rd., Shivaji Park, Mahim, Mumbai 16.

Printed at TRIKKON S. K.
N. M. Joshi Marg, Mumbai 400 013. Tel.: 98704 29093