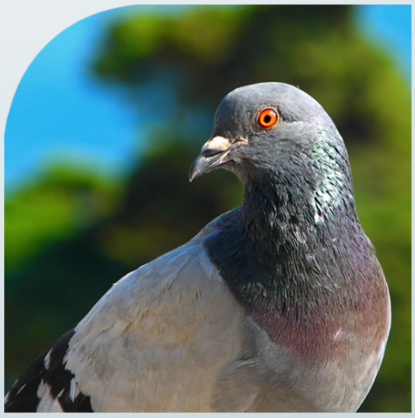
COMMON ANIMAL DISEASES



A GUIDEBOOK FOR PHARMACISTS AND PET OWNERS

This booklet is compiled by Annalise Attard as part of the dissertation carried out in partial fulfilment of the requirements of the course leading to the Degree of Master of Pharmacy. The study was carried out under the supervision of Prof Anthony Serracino-Inglott, Department of Pharmacy, University of Malta.

Annalise Attard sought professional veterinary advice to complete this handbook.

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A Guidebook for Pharmacists and Pet Owners

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Cats and Dogs

Arthritis and Joint pain[1,2]

Description

Arthritis, which is also know as a Degenerative Joint Disease is one of the most common conditions which affects middle aged to senior dogs and cats. Cartilage is found lining the joints where it acts as a protective barrier. Unstable joint moves in an abnormal manner, eroding the cartilage faster than it can be replaced and eventually bones end up rubbing against each other leading mainly to inflammation and pain.

Recognition

Degenerative Joint Disease has a very negative impact on the animal's quality of life. The first signs that one can notice is that the cat or dog is very slow and not showing interest in daily activities such as walking up the stairs. This is because the pet is uncomfortable to move since it is painful. For cats it may be a little more difficult to recognise since they spend a lot of time sleeping, however defecating outside the litter box or excessive grooming could be some crucial signs.

Signs and Symptoms

- Reluctant to walk, jump and run
- Limping
- Slowing down
- Urinating or defecating outside the litter box (a very useful sign for cats)
- Grooming excessively in one area (indicating focal arthritis pain)
- Trouble jumping
- Cats shows aggressive behaviour whilst dogs whimper when touched in the area
- Social desolation
- Lying down more often
- Stiffness
- Pain
- Inflammation

Similar Conditions

- Ageing
- Serious illness
- Trauma or Accidents
- Infection (septic arthritis)

Treatment

- Non-steroidal Anti-Inflammatory Agents; carprofen, robenacoxib
- Steroids; prednisolone

Arthritis is not curable however preventing further erosion is paramount, since it limits the chance of needing surgery in the future.

Advice

- It is important to stipulate to the correct dosing and not try to adjust it to provide more pain relief.
- Be careful when purchasing any over-the-counter medication.
- Supplement your pet's diet with omega 3 and 6 fatty acids, glucosamine and chondroitin
- Large breed dogs* are more prone to arthritis, thus it is important to maintain a healthy diet from the start. Provide specifically designed food so that growth takes place at an appropriate rate, since if it occurs too quickly joints might form in an abnormal manner eventually leading to joint disease.
- Certain cat breeds are also more prone to Degenerative Joint Disease, such as Himalayan, Siamese and Persian.
- Arthritis can be prevented by maintaining your pet with a healthy weight.

*Golden retrievers, Rottweilers, Labrador retrievers, German shepherds

Cat flu[3]

Description

As it can be noted from the nomenclature, this is solely a feline disease. Cat flu is a viral disease and the main strains responsible are the calici, herpes and rhinotracheitis virus. These species are specific meaning that they only transfer the disease from cat to cat. The disease is transmitted through aerosol droplet from secretions (while sneezing) left in the environment. Kittens are more susceptible to the infection since their immune system is not yet completely developed and thus weak.

Recognition

When a cat is seriously unwell, there is no need of a microbiological diagnosis since manifestations of cat flu symptoms are obvious. However, when unsure or when a stray cat is to be vaccinated, a swab of saliva should be taken for microbiological testing of the virus.

Signs and Symptoms

The disease affects the upper respiratory tract; nose, mouth, throat and eyes.

- Sore gums, tongue and eyes (in kittens sore eyes may lead to corneal ulcers)
- Purulent discharge from the eyes and nose (in kittens discharge may cause eyelids to stick together)
- Fever
- Sneezing
- Cough
- Excessive salivation
- Loss of appetite (due to the sore tongue and congestion)

Similar Conditions

- Common cold
- Viral infections

Treatment

- No cure is available since it is a viral disease.
- Cat flu vaccine is available for prevention.
- Antibiotics; to prevent secondary bacterial infection, such as pneumonia, due to the weak immune response.

Advice

- Since there is no cure, the cat's immune system should fight the disease and this may take up to 2 weeks to resolve.
- It is very important to nurse and support your cat through the disease by cleaning discharge from its nose and eyes.
- Keep your cat warm, well hydrated and hand feeding may support more intake.
- There are many similarities to the symptoms of human flu, but don't worry humans cannot get the flu.
- Following handling of an infected cat, it is important to wash hands properly and, if possible, change clothes before handling any healthy cats.
- The cat flu vaccine can be given to healthy cats so as to prevent infection and to avoid transmission of the virus to other cats.

Dental disease[4,5]

Description

Dental problems are very common in both dogs and cats because of the difficulty to clean their teeth. Apart from this, old age and sticky food also play a crucial role. Plaque is a colourless film which forms on the teeth and builds up over time as tartar. Since this is not removed by mechanical action like humans do, it leads to swollen, inflamed and red gums, known as gingivitis. Eventually, if this is not tackled it leads to a more serious condition known as periodontal disease, where the gums and tissue that support the teeth will be destroyed slowly and bacteria invade the gums.

Stomatitis is a reaction to the plaque build up and tartar accumulation. This is more common in cats than in dogs and presents with swelling of the gum tissue, and sometimes it extends to the pharynx including the tongue.

Recognition

Tartar accumulation can be visible by the naked eye as a yellow-brown film on the teeth. Swelling and redness can also be noticed which indicates either gingivitis or periodontal disease. Stomatitis is suspected when the dog or cat starts refusing food.

A thorough investigation might be needed to make sure that dental problems are not due to underlying conditions such as; kidney diseases or diabetes.

Signs and Symptoms

- Difficulty eating
- Pain while eating
- Bad breath
- Sore mouth
- Tooth loss
- Loose teeth
- Ferocious behaviour
- Weight loss
- Yellow or brown tartar on the teeth

- Inflamed and red gums
- Excessive salivation
- Bleeding gums
- Rubbing the mouth
- Cats may end up with a dull and matted coat since grooming is painful

Similar Conditions

- Kidney failure
- Diabetes
- Oral foreign body
- Oral cancer

Treatment

Preventing dental problems is the best option, however since bacteria might be an issue, antibiotics are prescribed.

- Antibiotics such as; co-amoxiclav, doxycyline and clindamycin.

Tooth extraction is another option.

Advice

- Do not worry! Dental diseases are curable.
- Support your pet through soft diets and liquids to maintain food intake.
- It is very important to schedule routine oral checkups at your veterinary and regular dental cleanings.
- Provide special pet food that helps to care for the teeth. Avoid sticky food as it sticks to the surface of the teeth and promotes the build up of plaque and tartar.
- Never use toothpaste to clean your pet’s teeth.

- Learn how to clean your pet's teeth;
    - Introduce the technique gradually and avoid stressing your pet. Keep session short and positive as much as possible.
    - To start, dip your finger into beef gravy and rub against the teeth gently in a circular motion.
    - Slowly, introduce gauze wrapped around your finger and eventually, try to introduce a soft tooth brush specially designed for pets.
- Normal dry food provides a moderate cleaning action by chewing on the kibbles.

Dermatitis[6-11]

Description

Skin conditions in both cats and dogs cause discomfort and irritation as a result of inflammation of the skin. There are many reasons why dermatitis can occur:

- Allergies; environmental factors such as pollen, dust and mould better known as seasonal allergies which get worse with age. Food allergies are less common than seasonal.
- Infections; bacteria can cause skin-related problems.
- Parasites; such as lice, fleas and mites can cause irritation to the skin. These can affect all type of animals; young and old, healthy and debilitated ones.
- Hormonal imbalance; both high and low.

Recognition

Feline skin problems are more complicated than canine skin problems. Visual inspection doesn't always lead to diagnosis, thus making it more difficult to determine the reason of the allergy.

Seasonal allergies; scratching occurs only in 1 or 2 months out of the whole year mainly in spring and autumn. This is best to identify by undertaking skin or blood tests, but is not as reliable for cats.

Food allergies; typically occur when the pet is intolerant to certain food and is itching and scratching all the time but not during certain months of the year. In this case, there is no food-allergy blood test that is reliable. In order to determine whether it is a food allergy or not it is necessary to provide a hypoallergenic or limited-ingredient diet for 2 to 3 months and then wait for the result. (This diet incorporates ingredients which the pet has never been exposed to, for example, introducing a whitefish and sweet potato diet to the dog.) If the itching does not lessen, then there is no problem with the food.

Parasites; it can be very difficult to detect flea infestation on cats as during grooming most of the fleas become ingested. The only visible signs are excessive scratching and bites on your own ankle. Combing the fur of the cat using a fine-toothed comb

on a sheet of white paper can make it easier to detect flea dirt present as black debris which produces a red stain when rubbed.

Signs and Symptoms

- Licking, scratching, itching or rubbing
- Bad skin odour
- Chewing fur out
- Little black dots on the fur especially on the abdomen
- Hair loss
- Scaly or flaky patches
- Pimples, spots or red patches
- Crusts or thickened skin

Treatment

To control ticks (only dogs), fleas, lice and mosquitoes.

- Pyrethrins (natural)
- Pyrethroids; synthetic relatives of pyrethrins. Read safety label as many cannot be used in cats.
    - Permethrin (only for dogs)
    - Etofenprox (safe to use in cats)
- Arylheterocycles; synthetic insecticide.
    - Fipronil
- Insect Growth Regulators; action is against the immature form and not the adult flea. Since this does not kill the adult flea, best to be combined with an adulticide.
    - Methoprene
    - Pyriproxyfen
    - Fenoxycarb
- Carbamate insecticide:
    - Methylcarbamate
- Imidacloprid (kills fleas but no activity against ticks, thus suitable for cats)

- Amitraz (use only for dogs); used as a dip to treat mange in dogs preventing the transfer from Lyme disease.
- Nitenpyram; oral flea control product. It works within 30 minutes and duration of action is 24 hours. Thus a topical application can be useful the following day. Safe to use in pregnant and nursing cats and dogs and kittens and puppies 4 weeks and older.
- Citrus extracts;
    - Linalool
    - d-limonene
- Synergists; used to increase the effectiveness of another ingredient in the product, for example pyrethrins.
    - Piperonyl butoxide
    - N-octyl bicycloheptene dicarboximide
- Sodium lauryl sulphate; natural and non-toxic flea and tick control.
- Spinosad; a derivative of a naturally occurring bacterium in the soil.

To control seasonal allergies:

- Short-term or mild skin allergies; anti histamines, corticosteroids such as prednisolone, fatty acid supplements, shampoos.
- Long-term or severe skin allergies;
    - Dogs: desensitization allergy injections (expensive treatment).
    - Cats: antibiotics, steroids and other drugs like cyclosporine.

Advice

- Make an early check on your pet for fleas before the hot weather starts, during the warm season, even all year round in order to prevent the problem.
- As a natural remedy for fleas;
    - Flea comb your pet twice a day, every day for months.
    - Give a bath once weekly
- Do not use garlic or essential oils to treat external parasites.
- If you are using a pyrethroid –containing anti-flea medication, it is important to apply high on the neck and give the prescribed amount. Also, make sure to separate other cats in the same household as licking this medication may

cause life threatening symptoms due to poisoning. The first signs of this are; excessive salivation, excessive twitching of the paw and vomiting. Should this occur, the pet should be taken to a veterinarian immediately.

- Avoid using sprays or dips as more effective treatment via the oral or topical route are available.
- It may be difficult to find fleas on your cats' fur as unlike dogs cats like to eat the fleas.
- Treat all the animals in the house against fleas. If, for example, you treat your dog remember that your cat may be a reservoir of fleas.
- Treating your pet for fleas is very important as this is a very painful condition as when us humans are bitten by mosquitoes.
- Do not apply calamine lotion or bitter lemon to sooth discomfort associated with allergies and scratching.

Diabetes[12]

Description

Diabetes is a chronic disorder of carbohydrate metabolism which involves deficiency in insulin production thus a change in the blood glucose levels which can be potentially life threatening. Insulin is essential to regulate the use and storage of blood glucose thus inadequate levels in the blood circulation cause hyperglycaemia and glucosuria. This reduction in insulin levels usually occur due to damage to the pancreas. Risk factors include;

- Body condition: overweight animals have a greater predisposition
- Breed: Burmese cats and Samoyeds, miniature poodles and schnauzers and bichon frise dogs are at a higher risk
- Age: any age, however greatest over 8 years
- Gender: male cats and female dogs are more prevalent
- Stress
- Poor nutrition
- Hormonal abnormalities

Recognition

Apart from the obvious signs which lead to the suspicion of diabetes, diagnostic tests are carried out to confirm the condition.

Signs and Symptoms

- Increased thirst
- Increased urination
- Sudden loss of weight
- Lack of energy
- Lethargy
- Vomiting
- Refusing food
- Strange and ferocious appetite
- Cataracts (in dogs)

- Abdominal pain
- Depressed

Similar Conditions

- Kidney problems
- Cancer
- Dental problems

Treatment

- Insulin
- Exercise
- Proper nutrition

Advice

- Regular blood glucose monitoring is essential to adjust the dosing of the insulin according to the need.
- It is very important to keep a routine to your pet's lifestyle. This means feeding, exercise and medication should be incorporated into a fixed daily schedule. This supports the stabilisation of blood glucose levels.
- Fibre is the golden key in managing diabetes, since fibre lower insulin requirements and blood glucose levels.
- Nutrition is very important to keep the pets' metabolism stable.
- Keep your pet active.
- Avoid protein and carbohydrate meals, processed foods and treats, artificial colours, flavours and preservatives.
- Keep your dog on a short leash when outdoors so as to avoid the indigestion of unwanted foods and material.
- It is very important to restrict the calorie intake of your cat since diabetes is mostly associated with overweight cats.

Ear problems[13-15]

Description

Otitis externa is the inflammation of the ear canal which may or may not involve the pinnae. It can occur either due to primary causes such as; auto-immune disease, allergy, foreign bodies, accumulation of hair and dead skin build up, parasites, etc or due to secondary causes such as medication reactions, bacteria, yeast, fungi or over cleaning. Young animals may be more predisposed to otitis externa and the most commonly affected dog breed is the cocker spaniel.

Otitis media is inflammation of the middle ear canal and is sometimes found together with otitis externa.

Recognition

Physical examination is essential to determine the extent of pain. Redness, swelling, scaling skin or obstruction of the ear canal can all be visible. It is also important to recognise whether it is curable or chronic, since for the latter lifelong management will be required.

Signs and Symptoms

Otitis externa

- Pain on manipulation of the ear
- Head shaking
- Odour
- Exudates
- Inflammation
- Pruritus

Otitis media

- Vomiting
- Tilting the head
- Anorexia

- Uncoordination

Treatment

- Systemic treatment is sometimes necessary since the most common cause of repeated otitis externa is undiagnosed otitis media. Antibiotics and antifungals may be prescribed.
- Topical treatment; usually consisting of antibacterial, anti yeast, corticosteroid and astringent as a combination product
- Pain and swelling managed by corticosteroids.

Advice

- If these signs are present, take your pet to a veterinarian since if left untreated it may lead to deafness.
- Ear hygiene is key in maintaining the ear healthy, however, whilst the pet is suffering from otitis externa it is important not to try and clean it yourself but to take to a veterinary surgeon.
- With the correct treatment, the otitis externa should resolve within 3 to 4 weeks, whilst for otitis media 6 weeks.
- When the ear problem resolves, you might need to clean your pet's ear once or twice a week to prevent further attacks. This is done by using cotton balls dipped in water and wiping clean the ear lobe and the cartilage. Make sure to undertake this procedure when your pet is not going to be disturbed.
- If lifelong treatment is required, you play an important role in the management for the life of the pet.
- It is important not to discontinue treatment since the ear looks better, but to stipulate to the correct dosing schedule.

Eye Inflammation[16]

Description

Anterior uveitis, also known as the red eye syndrome, occurs when the uvea which is the part of the eye which consists of blood vessels becomes inflamed. It could threaten the animals' vision since it also affects the iris and the surrounding pupil tissue. There are various causes including autoimmune disease, tumours, metabolic disease, trauma or injury and infections.

Recognition

Eye inflammation is very easy to recognise, however, other diagnostic tests may be undertaken to eliminate any other possible causes such as; high blood pressure in the eye known as glaucoma or even cataracts.

Signs and Symptoms

- Discharge
- Pain
- Redness
- Excessive tears
- Swelling of the eyeball
- Pupil has an uneven shape or is small
- Front of the eye is cloudy or dull
- Change in the colour of the iris

Treatment

- Topical treatment such as; drops or ointments in combination products.
- Systemic treatment is sometimes necessary for pain and inflammation.

Advice

- Take care to ensure that the living environment is well kept to avoid contracting a rare eye disease.
- Take time everyday to inspect your pets' eye for any changes.
- It is very challenging to instil the drops or ointment in your dog's or cat's eye, however do not give up since the sake of going blind is in your hands.

Gastrointestinal and Digestive disorders[17,18]

Description

A gastrointestinal disorder or disease - when the pet is suffering from a stomach, intestinal or any other related problem.

A digestive disorder – when the passage of food through the digestive tract is altered or there is a reduction in absorption or digestion.

A normal digestive process is paramount in a pet as essential nutrients and minerals are absorbed from the food that a dog or cat is fed. These are required primarily for energy and to support the repair and growth of body tissues.

Any change in the gastrointestinal system can result in; malnutrition, electrolyte imbalance, dehydration and changes in acid base concentrations of the blood.

Different types of Gastrointestinal and digestive disorders:

- Acute gastroenteritis; inflammation or infection or both of the stomach and intestines. This can be caused by eating high fat people food, rancid food, foreign objects or toxic plants. It can also be due to stress, food allergies or internal parasites.
- Colitis; inflammation of the colon which manifests as pain upon defecating. It is most frequently associated with tumours, change in food, swallowed foreign objects or allergies.
- Diarrhoea; results from infection, internal parasites, stress, rancid food or a change in diet.
- Constipation; mainly due to dehydration, increasing age, indigestion of hair or other foreign material and can also be due to tumours.
- Small intestinal malabsorption

Recognition

Digestive disorders can be easily recognised by the simplest signs of diarrhoea and vomiting.

Signs and Symptoms

- Vomiting
- Regurgitation
- Diarrhoea
- Constipation (food moves through GI tract at a slow rate)
- Flatulence
- Change in appetite
- Blood in faeces
- Weight loss
- Abdominal pain
- Weakness
- Dehydration

Similar Conditions

- Cancer
- Ageing

Treatment

Treatment varies according to the condition. The following are some medicines that may be used;

- Intravenous or subcutaneous fluids in extreme cases of dehydration
- Antibiotics in the presence of an infection
- Oral steroids such as prednisolone in the event of inflammation

Advice

- Severe diarrhoea or vomiting may lead to dehydration. It is important to consult your veterinarian immediately.
- Offer your pet lots of fresh water to maintain hydration.
- Change in diet is crucial to decrease digestive tract problems. Choose food which is high in soluble and insoluble fibre to be easily digestible.
- Never feed your pet scrapes of skin or other left over's which are not good for you. If they are not good for your neither are for your pet.

Heart disease[19-21]

Description

The common heart disease mostly seen in cats is hypertrophic cardiomyopathy which affects the heart muscle. The walls of the heart thicken and eventually the heart is unable to pump out the blood efficiently throughout the body. Also the heart doesn't fill up with a sufficient amount of blood. Eventually, this can lead to congestive heart failure with a build up of fluid in the abdomen and chest. Blood clot formation is another complication of heart disease. With increasing age and weight, there is a higher risk of developing a heart disease.

Recognition

If suspected, medical tests should be carried out such as; echocardiogram, blood pressure measurement, blood and urine tests, x-rays and stethoscope exam.

Signs and Symptoms

- Lethargy
- Tiredness
- Reduced ability to exercise
- Swelling of the abdomen
- Difficulty breathing
- Fainting
- Weakness
- Coughing
- Increased heart and breath rate
- Sudden death

Similar Conditions

- Cancer
- Weight problems

Treatment

There is no cure, however the control of symptoms is paramount to increase the years.

- Diuretics; furosemide
- Angiotensin II converting enzyme inhibitors; benazepril, pimobendan

Advice

- Treatment will not reverse your pets' heart disease.
- It is very important to feed your pet a healthy diet, low in sodium so that it will help to reduce the fluid build up and support the heart to work effectively.
- Exercise should not be vigorous but light.
- Weight management should be carried out more often.
- Support your pet through giving the medication daily and at the appropriate time and not how it suits you.

Kidney disease[22,23]

Description

The kidneys are responsible to remove waste substances from the blood and maintain a healthy fluid balance within the body. They are also known as life-sustaining organs, meaning if the kidneys are not functioning well, life-threatening situations may arise. Kidney disease can be either acute or chronic. Acute kidney disease can be a result of; certain drugs, poisons, trauma, surgical stress, infection, obstructed urine flow, shock, blood loss and severe dehydration. Chronic kidney disease is irreversible and progressive. The same factors as for acute disease play a role however hereditary and breed tendencies, immune system defects and nutritional factors are responsible.

Recognition

Some may show early signs of kidney disease; however, serious illness signs usually appear after 75% of the kidney function is lost. It is very important to detect it as early as possible by undertaking blood and urine tests. One crucial sign that suggests kidney problems is increased thirst, and therefore action should be taken immediately.

Signs and Symptoms

- Increased thirst
- Dehydration
- Lethargy
- Weakness
- Confusion
- Increased urine output
- Poor coat appearance
- Sore mouth
- Depression
- Bad breath
- Weight loss

- Less appetite
- Increased sleeping

Similar Conditions

- Heart disease
- Diabetes
- Hyperthyroidism
- Urinary tract disease
- Cancer

Treatment

- Euthanasia
- Kidney transplant (very expensive)
- Intravenous or subcutaneous fluids
- Bicarbonate: to neutralise, either given orally or intravenously
- Antibiotics: if infection is present
- Phosphate binders
- Omega fatty acids

Advice

- Support your dog or cat through this chronic condition. Be patient and caring.
- Dry food and water only can be problematic, since this does not provide the amount of water that canned food would.
- For cats, adding wet food and cat milk provide a good source of water, therefore preventing kidney and bladder problems.
- Low protein, salt and phosphorous food is important to prevent further deterioration of renal function whilst maintaining a positive quality of life.

Leishmaniasis[24-26]

Description

Leishmaniasis most commonly known as sand fly can be a deadly disease in dogs if not diagnosed early. This can also affect cats, however it is more common to affect dogs. It is caused by a bite usually in the muzzle or the ear by a tiny, sand coloured mosquito. The mosquito carries the protozoa *Leishmania infantum* and can bite the dog up to 100 times in an hour. This single cell organism travels to the dog's cells and invades the blood stream affecting the internal organs and eventually end up harming the immune system.

Recognition

Blood serum antibody tests need to be done to detect leishmaniasis. It is best to carry out the test in winter time and also yearly to exclude any possibility, and if present it will be detected as early as possible.

Signs and Symptoms

- Tiny skin lesion in the muzzle or ear
- Severe weight loss
- Loss of appetite
- Diarrhoea
- Vomiting
- Nose bleeds
- Exercise intolerance
- Alopecia
- Hyperkeratosis

Similar Conditions

- Dermatitis

Treatment

- Allopurinol; a human medicine usually used for gout

Prevention

- Collars containing deltamethrin
- Vaccine; can only be used in leishamania negative dogs
- Essential oils; such as neem, citronella, eucalyptus, lemon eucalyptus, lavender and tea tree. Very important: NEVER apply essential oils undiluted! It is best to dilute 1 part of the essential oil with 9 parts water, store in a spray bottle and always shake before use.

Advice

- The medication may cause urinary stones on long treatment.
- Proper nutrition is crucial to boost your dogs' immune system.
- Liver and kidney supplements are necessary to strengthen them due to the regular use of the medicine.
- Although the name implies sand, these are not found on sandy beaches but are found around rubble walls and old houses.
- The fly is sensitive to the sun thus it is active from dusk till dawn. To prevent bites it is best to avoid prolonged stays outdoors.
- Apply a natural insect repellent.
- Hairless spots are the areas where the flies bite.
- Don't worry, if your dog is moving it is difficult to be a target, however if it sleeps outside there is a higher risk of contracting this disease.
- In Malta, sand fly season commences in the beginning of May and stops end of September.
- Be careful, this is a zoonotic disease and the organisms living in the lesions can be contracted by humans!!

Urinary tract disease[27]

Description

The most common feline urinary tract disorder is feline interstitial cystitis. It is caused by an inflammation of an unknown cause; however stress can be one of the factors.

Urinary crystals or stones are a complication for both dogs and cats. This cause irritation, pain and blockage and is a very uncomfortable experience for the animal. Urinary bladder stones form from mineral crystals that come together as one.

Risk factors for urinary tract diseases include the following:

- Age: cats more than 1 year old and dogs between 2 and 8 years are at higher risk
- Gender: both genders carry an equal risk however males are more predisposed to life threatening urethral obstruction from stones.
- Overweight cats
- Lack of exercise
- Low water intake
- Nutrition: too much calcium, magnesium, phosphorous and protein

Signs and Symptoms

- Urinating outside of the litter box
- Loss of bladder control leading to incontinence
- Straining when urinating
- Licking the genital area
- Reduced appetite
- Blood in urine
- Lack of energy or interest in daily activities
- Frequent attempts to urinate
- Decreased urine flow
- Crying out in pain

Similar Conditions

- Kidney disease

Treatment

- Surgery, especially males
- Antibiotics; however not all cases have infections
- Anti-anxieties; for stress. Might take a while to work, however not recommended. Stress relief can be done in other ways.
- Glucosamine; to strengthen the bladder lining.

Advice

- Episodes usually subside with or without treatment and last only for a few days.
- Cats sometimes associate painful urination with the litter box and end up not using it.
- Stress for cats can occur because there are other guests at the house, conflicts with other pets and also lack of places to hide or rest. It is important to make changes to decrease stress in the environment.
- Be careful when choosing the right food for your pet and make sure that it does not contain high amounts of phosphorous, calcium or magnesium.
- Make sure to increase water consumption by providing fresh and clean water.
- Moist or canned food also helps to increase water consumption.
- Small meals several times a day are much better than one or two large meals a day.
- Any dog or cat which have been treated for urinary tract disease will be at risk of contracting it again, thus it is paramount to make sure to observe your pet to detect the signs early.

Weight Management[28-30]

Description

Excessive weight is not good for anyone even for animals. This can be the cause of serious health problems such as; arthritis, respiratory and heart disease and cancer. Too much eating especially together with lack of exercise is the perfect combination for weight gain due to the increase in body fat which is not being burnt by exercise. However, there are other contributing factors;

- Age: older age results in being less active and thus more prone to weight gain
- Spaying and Neutering: promotes a slower metabolism
- Gender: female cats more at risk
- Feeding habits
- Overfeeding
- Overeating
- Medical disorders
- Breeds: mixed breeds for cats and cocker and Cavalier King Charles spaniel and Labrador retrievers for dogs

Recognition

Some are very obvious to recognise, whilst some may not be that easy. Weight calculators for pets are available online.

Signs and Symptoms

- Ribs cannot be felt easily when running your hand along the side
- Loss of waist
- Slow movement
- Walking difficulties
- Sleeping a lot
- Bad temper
- Shortness of breath
- Looks exhausted when playing or exercising
- Collar needs to be loosen

Treatment

- Right nutrition
- Right exercise

Advice

- Never allow your pet to scrape the leftovers from your plate as our food can be the key to obesity.
- After feeding your pet, remove the food containers.
- Do not leave containers full of food, unless it is feeding time.
- Be careful when choosing the right nutrition. Many pet foods are full of fats and salts to make the taste better and may result in over eating.
- It is important to feed your pet low-fat and low-calorie food to promote weight loss.
- Although for you, your pet doesn't seem overweight, it is crucial to monitor the weight at your veterinarian to make sure to maintain a healthy life.
- To promote exercise and weight loss:
    - For dogs: walk your dog at a steady pace, enjoy playing time and try to play a retrieval game such as tossing a Frisbee.
    - For cats: call your cat to follow you, enjoy playing time by using a flash light and shining it on the walls so that your cat can chase it while exercising at the same time.

Rabbits

Coccidiosis[31]

Description

Coccidiosis is a parasitic disease which affects rabbits worldwide. There are 2 forms; hepatic and intestinal, the latter being the most dangerous and deadly. Transmission is carried out by the faecal-oral route for both, however, although good hygienic measures are carried out to eliminate coccidiosis, the intestinal form can still be present even in hygienic environments.

Recognition

This is carried out by microscopic detection of oocytes in the faeces.

Signs and Symptoms

- Anorexia
- Rough coat
- Intestinal lesions
- Hepatic lesions
- Diarrhoea
- Loss of appetite
- Weakness
- Lethargy
- Dehydration

Treatment

- Sulpha-drugs; Sulfaquinoxaline, sulphadimethoxime, sulphadimerazine
- Other coccidostats; amprolium, salinomycin, diclazuril, toltrazuril

Advice

- If treatment is successful, your rabbit is immune to the infection.
- Some rabbits may be carrying the disease without knowing, so be careful when your rabbit is in contact with new rabbits.
- It is very important to remove faeces frequently as to prevent the contamination of food and water with faeces.
- If your rabbit is kept in a wired cage even just to sleep overnight, the cage should be brushed daily.
- Using ammonia solution 10 % to sanitise the living areas is the best, since it kills the oocytes produced in the faeces.

Dental disease[32,33]

Description

The teeth are really important for a rabbit. Without the front teeth known as the incisors, the rabbit cannot strip, cut and snip. The tongue is used to push the collected food back to the grinding teeth where these break the harsh fibre down into small pieces that can be swallowed. Chewing all day is a lot of work on the teeth and eventually teeth wears down. However to allow chewing all day, the teeth grow faster than normal teeth would, therefore if the rabbit eats a low fibre diet the teeth won't wear down at a fast rate and result in overgrown teeth.

Recognition

The teeth grow both ways, up and down, so some signs may be strange to be associated with overgrown teeth. This is something really painful for the rabbit, so it is crucial to recognize the signs to take action.

Signs and Symptoms

- Wet chin due to excessive salivation
- Teeth grinding
- Creamy white eye discharge
- Runny nose
- Refuse food
- Matted fur
- Caecotrophs stuck to his bottom (caecotrophs are the pellets produced by the rabbit to re-eat)
- Facial abscess
- Weight loss
- Tongue or buccal lesions

Similar Conditions

- Pasteurellosis
- Myxomatosis

Treatment

- Teeth trimming; using scissor clipper or burring. This is done by a trained veterinarian.
- Tooth extraction

Advice

- The best food to give to your rabbit is grass or hay and not pelleted food.
- It is important to check your rabbit's teeth at home. This is done when the rabbit is calm, by lifting the lip with your fingers.

Dermatophytes Infection[33]

Description

Dermatophytosis, most commonly known as ringworm is a fungal infection. It is transmitted via direct contact and is generally related to poor nutrition, poor hygienic measures and stress.

Recognition

Areas which are infected are usually raised, red and consist of white flakes.

Signs and Symptoms

- Loss of hair
- Patches
- Scratching
- Itching
- Yellowish crusts

Similar Conditions

- Dermatitis

Treatment

- Oral Antifungals; griseofulvin
- Topical antifungals; itraconazole, clotrimazole, miconazole
- Copper sulphate dip

Advice

- Equipment (used for grooming, cleaning) should be disinfected to prevent re-infection.
- Separate other rabbits from the infected one.
- Be careful when introducing new rabbits to the household because they may be asymptomatic carriers.
- This disease can be transmitted to humans! Take special precautions by using gloves to handle the infected rabbit!

Heat Stroke[33]

Description

Rabbits are very sensitive to heat. Poorly ventilated areas and humid, hot weather are factors which predispose to heat exhaustion. This can lead to death.

Signs and Symptoms

- Stretching out
- Breathing rapidly
- Redness of the ears
- Confusion
- Slow movement
- Salivating

Treatment and Advice

- Cool water should be available at all times.
- Bathing with cold water during warm weather is ideal, but never attempt to put a rabbit suspected of having a heat stroke under cold running water.
- Provide shady areas and out of direct sunlight.
- Take great care when air conditioning your rabbit because temperature elevation may occur more rapidly after predisposing to heat.
- Grooming your rabbit helps to remove all that excess hair.
- Do not forget to keep your rabbit well hydrated by providing fresh vegetables since they are a good source of water.

Mites[34]

Description

Ear mites infestation is caused by parasites which affect either one ear, both and also surrounding areas such as the neck, head, genital region and the abdomen. The mites create what is known as an ear canker because they irritate the ear and form brown crusts. If untreated it may penetrate the inner ear, cause damage to the brain and can result in totricollis (torsion of the neck).

Recognition

It might not be easy to recognise, however, skin scales might be very visible on the inner ear, which turn into larger and thicker crusted lesions and can also be accompanied by hair loss. Mites might not be visible to the naked eye but your veterinarian will determine the cause.

Signs and Symptoms

- Itching around the ear, neck and head
- Head shaking
- Head scratching
- Hair loss or peeling
- Brown crusty exudates in the ears
- Affected areas may become extremely painful
- Pyrexia
- Lethargy
- Loss of balance

Similar Conditions

- Ear infections

Treatment

- Antiparasitic drugs: ivermectin, selamectin
- Topical antibiotics
- Oral antibiotics

Advice

- The mite is contagious, thus it is imperative to isolate the affected rabbit and treat all rabbits in the household. Clean thoroughly the living area and discard of all organic material in the cage.
- The cage should be cleaned everyday during the treatment period and nothing should be reused.
- Any combs and brushes should be discarded to prevent re-infection.
- Do not attempt to remove the crusts from the skin.
- Important to attend for a follow up 1 month after the treatment commences.

Fur mites are not as problematic as ear mites, but are very common and can be easily transmitted by direct contact. Whilst ear mites cause extreme itching, fur mites do not. Dandruff may be noticed coming off your rabbit which can be detected upon placing against a dark background. Insecticides, such as imidacloprid, can be applied to prevent infestations.

Myxomatosis[35]

Description

This fatal disease is caused by a myxoma virus and can occur in all domesticated rabbit breeds. Some rabbits are resistant, such as the cottontail and jackrabbits. Transmission can occur via direct contact and through bites from mosquitoes, flies and fleas.

Recognition

Eye inflammation with milky discharge is the initial symptom.

Signs and Symptoms

- Eye inflammation
- Milky eye discharge
- Anorexia
- Weakness
- Lethargy
- Pyrexia
- Death within 48 hours
- Purulent nasal discharge
- Rough coat
- Depression
- Swollen eyelids, ears, nose and lips
- Swelling of the genital area
- Coma

Similar Conditions

- Dental problems
- Eye infections
- Pasteurellosis

Treatment

There is no cure to viral infections.

- Fluids
- Antibiotics; to prevent secondary infections

Euthanasia is sometimes recommended, to prevent the long and painful death.

Advice

- To prevent your rabbit from contracting this disease, protect against mosquitoes and biting flies. This can be done in several ways;
    - Surround the living area (even if indoors) with mosquito netting
    - Avoid outsides in the early mornings and late afternoons
    - Use flea prevention products such as imidacloprid
    - Vaccination (if available)
- It is very difficult to accept that the best option for your pet is euthanasia, however, this is a fatal disease and otherwise your rabbit will pass through an agonising death.
- It is very important to disinfect all the equipment used by the infected rabbit.
- Wait 4 months before bringing a new rabbit to ensure complete eradication of the virus.

Pasteurellosis[36]

Description

This condition is also known as snuffles because of the characteristic snuffling breathing sound. Some rabbits do not show symptoms of infection, because these microorganisms reside in the nasal cavity and upper respiratory system and are kept in equilibrium by the rabbit's immune system. If the bacteria become active, infection can spread to the sinuses and bones of the face and on long exposure to the eyes, ears and blood. This is a highly contagious disease, and can be transmitted both by direct contact and aerosol.

Recognition

The characteristic breathing sound and exudates coming out the nose and eyes are the main factor to recognise this condition; however, since the signs are so widespread a nasal swab will usually be taken for testing. Sometimes a complete blood count and urinalysis are also undertaken.

Signs and Symptoms

- Strange behaviour
- Staining of the front paws (with discharge collected whilst grooming)
- Anorexia
- Depression
- Head shaking
- Torticollis
- Excessive tears
- Blockage of the tear ducts
- Shortness of breath
- Scratching of the ears
- Genital infections; thick whitish greyish discharge

Similar Conditions

- Dental disease
- Ear infection
- Eye infection
- Cold
- Sinusitis

Treatment

- Antibiotics; enrofloxacin
- Surgery

Advice

- Infection can spread through the air and is highly contagious especially for rabbits at birth. They can also contract it during birth or shortly after from close contact with an infected mother.
- Separate your rabbit from others and make sure to keep yourself sanitised to prevent from spreading the disease.
- It is very important to support your rabbit through this condition. Help by cleaning the nostrils, keeping him warm and provide the right nutrition.
- It is imperative to encourage oral fluids either as fresh water or also as leafy vegetables and moistened greens such as parsley, carrots, cilantro etc.
- Do not give high carbohydrate or high fat food.
- If your rabbit is not eating, you have to feed using a syringe appropriate gruel mixture.

Red Eye Syndrome[37]

Description

This is one of the most common eye problems seen in rabbits. Red eye is a result of many different causes;

- Bacterial infections
- Glaucoma: can lead to blindness if untreated
- Corneal ulceration: mainly due to trauma
- Conjunctivitis: inflammation of the lining of the eye
- Keratitis
- Dental disease

Recognition

The underlying cause determines different signs, and usually it is a very difficult task to come to the exact cause. However, if your rabbit has a red eye, which can be recognised by swollen and irritated eyes, take immediately to a veterinarian.

Signs and Symptoms

- Eye discharge
- Swollen eye
- Impaired vision
- Extra tissue around the eye
- Nasal discharge
- Cold
- Lethargy
- Crusting
- Hair loss around the eyes and nasal area
- Abnormal posture

Similar Conditions

- Dental disease
- Myxomatosis
- Pasteurellosis

Treatment

- Topical antibiotics
- Topical atropine
- Topical steroids

Advice

- Check you rabbit's teeth.
- Take particular caution when caring for young rabbits since they are more susceptible to eye disease.
- Minimise source of irritation such as dust and dirt by daily cleaning.
- At first, you can use any commercial eye washing product to remove any debris and dirt form the eye of your rabbit.
- Repeated eye checks may be necessary to monitor outcomes of therapy and especially to prevent blindness.

Trichobezoars[38]

Description

Rabbits groom themselves continuously, so hair is often found in the stomach but this doesn't normally cause symptoms. Usually, it is passed with other stomach contents and excreted as faecal pellets. Hair chewing can be due to different reasons, one of them is having a low fibre diet and the other strangely enough is boredom. Rabbits are not capable of vomiting the hair balls like cats, and unfortunately it must be able to pass through the digestive system.

Recognition

It is very difficult to recognise this condition, so it is best to avoid by practising effective preventative measures. An abnormally distended abdomen might be visible and it calls for an emergency veterinary appointment.

Signs and Symptoms

- Weight loss
- Anorexia
- Death within 3 to 4 weeks
- Gastric ulceration
- Decreased food intake
- Abdominal distension
- Pain
- Dehydration
- Diarrhoea
- Weakness
- Teeth grinding

Similar Conditions

- Pasteurellosis

Treatment

- Add magnesium oxide to the diet
- Motility stimulants; such as metoclopramide
- Fluid therapy
- Pain medication
- Antiulcer therapy
- Probiotics

Advice

- To stop boredom, provide an environment where the rabbit can play and keep himself busy.
- To treat an early case, pineapple juice can be given since it contains bromelain, which is a digestive enzyme and helps to break up the hairball. Canned pineapple juice is not effective since the enzyme is destroyed with the process of canning.
- The best option is to prevent by providing your rabbit with a high fibre diet.
- Daily combing helps to remove any loose hair.
- Avoid stressing the rabbit by changing the environment for no reason.

Ulcerative Pododermatitis[33,39]

Description

Ulcerative pododermatitis is commonly referred to as sore hocks where the footpad appears to be crusted, swollen and even bleeding. This can even spread to a bone infection known as osteomyelitis and lead to death. Sore hocks can result from excessive weight due to pressure of the skin on wired floor cages or from trauma. Other factors can play a role in predisposing the rabbit such as, nervousness, genetics, heavy breed, urine soaked faeces, type of wire used and posterior paralysis after a spinal cord injury.

Recognition

It is very easy to recognise from the following signs. However, early detection is crucial to prevent infection moving from the wounds to the bones.

Signs and Symptoms

- Swollen foot pad
- Crusts
- Bleeding
- Lethargy
- Bone infection
- Tiptoe walking

Similar Conditions

- Osteomyelitis

Treatment

- Debriding agents; to clean the lesions
- Topical antibiotics
- Leg amputation

Advice

- Condition may recur.
- First use debriding agents to clean the lesions and afterwards apply the topical antibiotics.
- Help your pet to lose weight, by feeding more grass and hay rather than pellets.
- Play with your rabbit to help exercising and moving.
- Remove soiled bedding to ensure the area is kept dry. Make sure to provide non-abrasive and soft bedding.
- Daily checking of the feet can prevent this problem.

Pigeons

Coccidiosis[40]

Description

This is a very common intestinal disease amongst pigeons worldwide due to the protozoa *Coccidia* which reside in the small intestine of nearly all pigeons. It forms long lasting oocytes and following incubation these become infective.

Recognition

Coccidia oocytes are first ingested by the pigeon and development takes place in the intestine within 4 to 7 days in different stages, resulting in damage to the intestinal wall. As a result, the pigeon starts to excrete oocytes again.

Two forms of coccidiosis:

1. Asymptomatic form: occurs most frequently. Birds develop resistance/ immunity with the help of the internal defence mechanisms to the first small quantities of oocytes ingested. This immunity is strengthened constantly by the ingestion of small amounts of oocytes in turn protecting against the severe form.
2. Acute/ Visible form: occurs at extremes of age; Young pigeons still without resistance to the oocytes or older pigeons whose immunity is lowered by stress factors.

Signs and Symptoms

Asymptomatic form:

- Appear healthy but less lively
- Droppings sometimes soft (small amounts of oocytes present in faeces)

Acute form:

- Noticeably affected
- Noxious, watery-like, greenish and sometimes bloody diarrhoea (large amounts if oocytes present in faeces)
- Puffed up feathers

- General condition impaired: reduced feed and increase water intake resulting in general malaise and malnutrition.

Similar Conditions

- E.coli infection
- Salmonellosis
- Worm infestation

Treatment

Asymptomatic form: Do not treat, although they show mild symptoms of infestation so as not to disturb the resistance being developed.

Acute form:

- Antiprotozoal agent; amprolium which is a coccidiostat

Advice

- Development of feathers will not be disrupted.
- Support treatment by the administration of vitamins particularly A and K3 and supplements of amino acids.
- Use best possible diet.

E.Coli infection[41]

Description

Escherichia coli infection is the second most common disease of the digestive tract following salmonellosis. E.coli bacteria are present as part of the normal flora of the gut of both warm blooded animals and humans. These can also survive for many months in faeces provided that there is an adequate environment. An E.coli bacterium is re-introduced into the body with contaminated feed or water or via inhalation through dust particles.

Recognition

Rapid multiplication of the E.Coli bacteria results in inflammation of the intestine with consequent diarrhoea in turn leading to loss of water and electrolytes.

Bacteria can also penetrate into the bloodstream affecting individual organs resulting in a systemic infection which after only a few hour or days leads to death.

Signs and Symptoms

Typical signs of a systemic disorder;

- General condition impaired: reduced feed and increase water intake resulting in general malaise and malnutrition
- Ruffled feathers
- Pain signs; drawn up back and lowered tail
- Respiratory tract may also be involved

Similar Conditions

- Coccidiosis
- Salmonellosis
- Hexamitiasis

Treatment

- Nitrofuran antibacterial agents; furazolidone
- Chloramphenicol
- Penicillin antibiotic agents; ampicillin

Advice

- Pigeons which are affected with the infection should be selected and separated from the entire flock as these can shed the pathogens.
- Remove factors within the loft which lower the resistance to pathogens: ventilation and waste-air extraction, deficient supply of oxygen, presence of noxious gases, dust in the loft, stocking density.
- Do not leave any feed overnight due to the risk of contamination by insects, mice or rats. Apart from this precaution, feed and water bowls are to be cleaned thoroughly and make sure that no rodents can access the loft.

Ectoparasites[42]

Description

External parasites are very common in pigeons and can lead to harm in many different ways. Feather lice, body scabies and scaly-leg mites spend their life cycle permanently on the pigeon. These 3 types of parasites live up to 3 months, and can reproduce within 3 to 6 weeks. The lice lay its eggs in the pigeon's feathers while the mites attach themselves to the outer layer of the skin. The scabies mice give birth directly to living larvae.

Red bird mites, pigeon and bird ticks attack the pigeon's body only at night to suck on blood. In the early morning they hide themselves within the loft; in cracks, under feeding troughs or nest bowls. These can also transmit pathogens.

Recognition

Feather lice: visible on the pigeon's feathers. Spreading the pigeon's wing under light can aid detection.

Body scabies and scaly-leg mites: not visible by the naked eye but can be detected through signs.

Red bird mites, pigeon and bird ticks: can be detected early in the morning searching for a hiding place.

Signs and Symptoms

Feather lice: feed on feather material and skin scales leading to feather damage.

Body scabies mites: feed on body fluids and tissues leading to scaly dermatitis (rash with sores).

Scaly-leg mites: feed on body fluids and tissues as well but result in scaly deposits.

Red bird mites, pigeon and bird ticks: feed directly on blood leading to anaemia (weight loss)

Treatment

Pesticide:

As a spray; apply to the loft and all the equipment used. If product chosen is safe, apply directly on the pigeons feathers also from the underside. Apply also to pigeons which show no signs.

As a bath; use luke warm water, and immerse the pigeon up to its neck with the wings spread out leaving it for 1 minute.

Treatment must be repeated according to the type of parasite, to ensure complete eradication.

Advice

- Before treating with the pesticide, make sure that all the equipment and the loft are cleaned thoroughly.
- Check for parasites within the loft early in the morning by inspecting the cracks in the loft, under feeding troughs and bowls or beneath any other materials within the loft.
- To protect the pigeons against external parasite infestation, give them a bath at least once a week.
- How long parasites take to develop and survive is temperature dependent. In the hot summer days they may develop faster, thus it is important to take more precautions.
- Lifespan of the pigeon and bird ticks is very long about 2 to 4 years. When treating, make sure that these are eradicated.

Endoparasites; Worm infestation[43]

Description

The type of parasites found in pigeon flocks are roundworms, hairworms and tapeworms, the latter being the least common. These survive by feeding in the intestines of the pigeon. As the name implies the hairworm is a hair-like parasite, very slender and long, with their eggs being the most infectious after 8 to 9 days. The hairworm is not a specific parasite to pigeons only, but can also infect other poultry species. The roundworm occurs only in pigeons, and its eggs become mostly infectious after 2 to 3 weeks. Tapeworms depend on intermediate hosts to be transmitted to pigeons. This can occur through the consumption of snails, ants or beetles.

Recognition

Tapeworm infestation can be identified by examining the faeces for eggs or segments. However, other parasite infestations are only visible through microscopic examination of the faeces.

Signs and Symptoms

Period from ingestion of worm eggs to the first excretion of the eggs in faeces for;

  - Tapeworm is about 2 weeks
  - Hairworm is 3 to 4 weeks
  - Roundworm is 5 to 6 weeks

- Following 10 to 12 days of consumption of the eggs, droppings may vary in consistency and appearance.
- Initially, appetite increases, but upon progression of infestation it diminishes.
- Anorexia; weight loss
- General condition impaired: lifeless, laid-back, reluctance to fly.
- Ruffled feathers

Similar Conditions

- E.Coli infection
- Salmonellosis
- Coccidiosis

Treatment

- Anthelmintic agents; fenbendazole

Advice

- All pigeons in the flock should be treated at the same time.
- Examine the faces for eggs or segments to ensure complete eradication.
- Do not treat if pigeon is nurturing the young or whilst in the main process of moulting.
- Do not leave any feed overnight due to the risk of contamination by insects. Apart from this precaution, feed and water bowls are to be cleaned thoroughly and make sure that no insects can access the loft.

Hexamitiasis[44]

Description:

Pigeons usually present with this disease due to the flagella, *Hexamita columbae* which affects the rectum. Flocks are mostly to become infected during the summer and autumn period. The incubation period is about 4 to 5 days.

Recognition:

Adult pigeons infected with hexamitiasis do not usually present with noticeable signs and symptoms, but it can be recognised because there is an increase in the quantity of droppings.

Signs and Symptoms :

- Watery-like or bloody and noxious diarrhoea
- General condition impaired; reduced feed and increase water intake resulting in general malaise and malnutrition.
- Young pigeons; the entire intestines become involved with bloody diarrhoea, sometimes leading to death.

Similar Conditions:

- E.coli infection
- Salmonellosis
- Coccidiosis
- Paramyxovirus infection

Treatment:

- Antiprotozoal agents; Dimetridazole
- Aminoglycosides antibiotics; Aminosidine sulphate

Advice:

- It is important to treat all the pigeons living together at the same time.
- Do not dilute medication if there is the need to increase drinking water (for example, during the hot weather), but following medicated water provide fresh water.
- Do not provide bath water.

Infectious catarrh[41,45]

Description

Infectious catarrh is a disease of the respiratory tract which often results because of mixed infections (mycoplasma, viruses, fungi and trichomonads). The birds' resistance to infection is reduced due to the pathogenic bacteria developed (pasteurella, cocci and coli bacteria) and also due to factors within the loft environment.

Recognition

- Behaviour of the affected pigeon
- Inflammatory changes in the head region and respiratory tract
- Characteristic sound of respiration (example: wheezing)

On first suspicion of the disease a veterinary examination is vital.

Signs and Symptoms

Initial stage;

- Sneezing and aqueous nasal discharge

Acute stage;

- Nasal discharge becoming mucopurulent and yellowish brown in colour
- General condition impaired; reduced feed and water intake, cessation of down moulting, reluctance to fly.
- Wattle and bridge of nose turn grey
- Beak opened: stringy mucus stretching from the retrolingual region to the palate
- Redding and swelling of pharyngeal mucosa

Advanced stage;

- Inflammation extends to windpipe and lower respiratory tract
- Visible and audible catarrh (wheezing)

- White-yellow deposits in the laryngeal region

Similar Conditions

- Ornithosis
- Trichomoniasis

Treatment

- Pleuromutilin antibiotics; tiamulin, valnemulin
- Aminoglycoside antibiotics; lincomycin, spectinomycin, foramycin
- Tetracycline antibiotics; chlortetracycline
- Macrolide antibiotics; tylosin

Advice

- It is important to start treatment immediately upon appearance of first signs.
- Do not provide bath water.
- Do not give any feedstuffs containing calcium (as it binds to tetracycline antibiotics in turn reducing its efficacy).
- No free flight for affected pigeons.
- Remove factors within the loft which lower the resistance to pathogens; ventilation and waste-air extraction, deficient supply of oxygen, presence of noxious gases, dust in the loft, stocking density.

Ornithosis[46]

Description

Ornithosis is caused by *Chlamydia psittaci* micro organism through invading internal cells. Transmission of infection can occur; indirectly via inhalation of dust particles containing the pathogen and also directly by ingestion of contaminated food and water with faeces.

Recognition

This disease is very difficult to recognise since no clinical sign is definite for ornithosis. A swab either from the nose, eyes or the genital or anal area is taken to confirm diagnosis.

Signs and Symptoms

Acute form (occurs in young pigeons):

- Wheezing (recognised as pigeon breaths with half opened beak)
- Inflammation of one or both eyes (presented as redness, yellow crusts and pus covering the whole eye)
- Watery-like diarrhoea

Chronic form (occurs in adult pigeons):

- Few or no signs shown

Similar Conditions

- Paramyxovirus infection
- Infectious catarrh
- Salmonellosis

Treatment

- Tetracycline antibiotics; chlortetracycline, doxycycline
- Fluoroquinolone antibiotics; enrofloxacin

Advice

- Pigeons which are chronic carriers (ie. Appearing healthy following survival of infection) should be selected and separated from the entire flock as these can shed the pathogens at irregular intervals.
- Do not provide bath water.
- Do not give any feedstuffs containing calcium (as it binds to tetracycline antibiotics in turn reducing its efficacy).
- No free flight for affected pigeons.
- Remove factors within the loft which lower the resistance to pathogens: ventilation and waste-air extraction, deficient supply of oxygen, presence of noxious gases, dust in the loft, stocking density.
- To prevent transmission it is very important to take precautions, by using gloves and face masks and applying good hygiene measures.
- This disease can also be transmitted to humans and other mammals, leading to atypical pneumonia and also life threatening acute illness!

Paramyxovirus infection[45,47]

Description

This infection can be contracted only by pigeons and not by any other bird species. Infected pigeons shed the virus via secretions from mucous membranes (eyes, nose and throat) and also in faeces.

Recognition

The virus is detected through tissue samples and swabs taken from suspected pigeons. It is best to be recognised during the initial incubation period, since afterwards it may lead to death.

Signs and Symptoms

Incubation period of the infection: 3 to 21 days

Initial signs;

- Reduced intake of feed and increased water uptake
- Anorexia
- Faeces present in a puddle due to increased water excretion

Following some days into incubation period;

- Paralysis of one or both legs
- Reserved
- Torsion of the neck
- Twisting movement of the body
- Walking in reverse
- Death

Similar Conditions

- Salmonellosis

Treatment

No treatment for viral diseases.

Advice

- About 30% of the infected pigeons may recover on their own following 4 weeks of infection.
- Support viral infection and other pigeons in the flock by vitamin, herbal extracts, ginseng and amino acid supplements.
- Vaccination should take place if viral infection is suspected in a flock, even in pigeons which appear unaffected, as to avoid spreading of the virus. This is the most effective way of preventing and controlling infection by the paramyxovirus.
- However, affected birds which show symptoms of infection should be selected and separated from the entire flock and cannot be vaccinated.

Pigeon Pox[45]

Description

This viral infectious disease is characterised by changes on the skin and mucous membranes of the pigeons. It cannot be transmitted to humans or other mammals. Its incidence is greater in humid and warm weather.

Recognition

Disease last for about 3 to 4 weeks; if pigeon is malnourished it can also lasts for several months. Both forms of the pigeon pox can be clearly recognised because both scaly skin and lumps are visible.

Signs and Symptoms

Skin form;

- Scaly skin develops especially around the eyes and beak (where mucous membranes meet the skin), and also on the legs. It can be clearly identified from normal skin.
- Virus enters the skin through lesions such as scratches or insect bites

Mucosal form;

- Lumps develop in the throat; these may impair food and water intake and breathing.
- Can be confused with canker but can be easily distinguished as these lumps form part of the tissue underneath.

If virus enters systemically, it impairs general condition through effect on internal organs.

Similar Conditions

- Ornithosis
- Infectious catarrh
- Trichomoniasis

Treatment

No treatment for viral diseases.

- Antibiotics such as chlortetracycline; to prevent secondary bacterial infections

Advice

- Support viral infection and other pigeons in the flock by ginseng, vitamins, herbal extracts and amino acid supplements.
- Do not attempt to remove the scaly skin as there is a risk of bleeding.
- Treat any secondary bacterial infection if any suspected, as these may complicate the presentation of pigeon pox.
- No free flights for affected pigeons.
- Do not provide bath water.
- Do not give any feedstuffs containing calcium (as it binds to tetracycline antibiotics in turn reducing its efficacy).
- Prevention is better than cure! Pigeon pox vaccine is available for immunisation against the disease.
- Provide best possible diet.
- Vaccination should take place if infection is suspected in a flock, even in pigeons which appear unaffected to avoid spreading of the disease.
- However, affected birds which show symptoms of infection should be selected and separated from the entire flock and cannot be vaccinated.

Salmonellosis=Paratyphus[41]

Description

This infectious bacterial disease has the highest mortality rate amongst pigeons. The bacterium *Salmonella typhimurium,* can live in the environment given the right conditions for more than 1 year.

Recognition

Apart from the visible signs, samples taken from faces, blood and tissue of the infected pigeon are taken to confirm diagnosis.

Signs and Symptoms

Acute form (affects mainly young pigeons):

- Enteritis; few watery-like and greenish droppings with white flocculent components.
- Organs become infected and result in growth retardation, malnutrition and sometimes death.

Chronic form (affects mainly adult pigeons):

- Inflammation results in thickening of the joints (esp. Elbow joint), infirmity in legs and wings, balance disorders and torsion of the neck.

Similar Conditions

- Ornithosis
- Paramyxovirus infection
- Worm infestation
- Coccidiosis
- Trichomoniasis

Treatment

It should be initiated as soon as first symptoms appear. Start with chloramphenicol.

- Antibacterial agent; chloramphenicol
- Penicillins; ampicillin

Advice

Salmonella transmission can take place via sexual or physical contact and through contamination of the feed and water bowls.

To avoid:

- Remove factors within the loft which lower the resistance to pathogens: ventilation and waste-air extraction, deficient supply of oxygen, presence of noxious gases, dust in the loft, stocking density.
- Do not leave any feed overnight due to the risk of contamination by insects, mice or rats. Apart from this precaution, feed and water bowls are to be cleaned thoroughly and make sure that no rodents can access the loft.
- Care when mating. Blood tests of suspected pigeons should be carried out, since disease can be transmitted from the hen to the egg.
- Also, take care when nestling are fed because of the risk of contaminated crop milk.
- Pigeons which are chronic carriers (ie. Appearing healthy following survival of infection) should be selected and separated from the entire flock as these can shed the pathogens at irregular intervals.
- It is important, to treat the entire flock even if only one pigeon shows symptoms. Before hand, severely affected pigeons should be selected and separated as these are unlikely to be cured.
- Vaccination is the most effective way of preventing and protecting pigeons against salmonellosis. All pigeons in the flock that appear healthy can be vaccinated.
- Remove pigeons which show signs of illness.

Trichomoniasis[48]

Description

Trichomoniasis is also commonly known as canker. Most of the pigeons are carriers of the flagella trichomonads. These live in the mucosal membrane of the throat, beak and oesophagus and are also present in produce. Infected pigeons transmit the parasites through faeces and saliva, in turn, affecting the young pigeons while feeding together.

Signs and Symptoms

Adult pigeons:

- Decreased endurance
- Reluctance to fly
- Diarrhoea
- Bloody coloured throat
- Upon progression; yellow buttons form on oral mucosa growing into yellow deposits ie. canker.

Young pigeons:

- Abscess
- Pungent-smelling liquid droppings
- Subnormal growth
- Constantly crying for food

Similar Conditions

- Sialoliths: salivary calculi; these occur as a result of solidified saliva (secretions of the mucous glands). It presents as white dots (firm and yellowish/white to grey nodules) at the end of the throat.

Treatment

- Antiprotozoal agents; Dimetridazole
- Aminoglycosides antibiotics; Aminosidine sulphate

Advice

- It is important to treat all the pigeons living together at the same time.
- Do not remove yellow deposits from oral mucosa (canker) as there is a risk of bleeding.
- Do not dilute medication if there is the need to increase drinking water (for example, during the hot weather), but following medicated water provide fresh water.
- Do not provide bath water.

Wet Droppings[40,50]

Description

The pigeons' state of health can be analysed through the appearance, composition and smell of the faeces. Normal gut contents leave the intestinal tract in the form of a paste (like toothpaste) as contents thicken during their way out and urine is thickened and excreted as uric acid crystals with faeces appearing as white constituents.

Changes in faeces can be due to many possible causes such as;

- Change of weather; low temperature, humidity, drafts.
- Psychological stress; racing season, agitation of individual pigeon, vaccinations, exhibitions, changes in the loft layout and feeding times.
- Disturbance in the fluid balance leading to loss of water, minerals and trace elements; changes in type of feed, intolerance to certain feed.

Recognition

It is very easy to recognise by analysing the appearance, composition and smell of the faeces.

Signs and Symptoms

- Faeces not thickened; gut contents spend less time in the intestine
- Urine not thickened because of increased volume (due to excessive water intake)
- Result: Diarrhoea or wet droppings

Similar Conditions

- Paramyxovirus infection
- E.Coli infection
- Salmonellosis
- Coccidiosis

Treatment and Advice

- Eliminate any of the possible causes which can result in wet droppings.
    - Avoid temperature changes, especially in the very hot and very cold months; use air-extractors.
    - Avoid changes in the loft layout and feeding times.
    - Provide supplements for stress which pigeons develop before a race.
    - Take care when changing type of food; inspect faeces produced by pigeons for any intolerance to any ingredient in the feed.
- Diarrhoea results in loss of water, minerals and trace elements. It is important to replace this loss to stabilise the flora of the gut; use electrolytes.
- Do not provide bath water.

Young Bird Sickness[49]

Description

This infectious disease is responsible for several deaths amongst young pigeons. The pathogens involved are both bacteria and viruses and are transmitted by air, direct contact between birds and through contaminated water and feed.

Signs and Symptoms

- Sudden death form; no signs of the disease are present prior to death
- Signs of the disease are present prior to death
    - Period between onset of symptoms and death is about 3 to 7 days.
    - Puffed up feathers
    - Lifelessness
    - Refusal of feed
    - Vomiting
    - Weight loss
    - Watery-like and greenish to yellowish puddle-like faeces

Similar Conditions

- Hexamitiasis
- E.Coli infection

Treatment

- Nitrofuran antibacterial agents such as furazolidone

Advice

- Support using vitamins (eg; crucifers; extremely effective against bacteria, viruses and fungi) and immunoglobulins which enhance the immune system when there is a suspect of infection due to contact with other young pigeons eg; introducing new youngsters to the flock or during racing season.

- Stress factors promote the onset of the disease;
    - Avoid introducing other birds into the same loft.
    - Support using vitamins when vaccinating since it is stressful.
    - Temperature control is important as heat promote bacterial growth and water shortage.
    - Do not over stress the pigeon when training them for flights.

General information[50]

Hygiene

It is important to clean the loft daily by removing all the droppings, waste matter and litter. Using a vacuum cleaner may aid cleaning difficult areas such as cracks within the loft. The feeding and water containers should be cleaned daily as well using hot water.

Disinfection is crucial to eliminate both parasites and pathogens. Care should be taken when using the product, as some can be applied on the pigeons while some are harmful to the pigeons. It is important to read specific product instructions before use. Control of other insects and small rodents can also be taken but make sure that product won't harm the pigeons or else take special precautions.

Support during treatment

When treating any specific pathogen it is important to complement the treatment using other treatment modalities.

- To support the replenishment of the flora of the gut, natural bacteria and B-complex vitamins can be administered following antibiotic treatment or infection.
- To improve and support the pigeons' immune system, ginseng and other medical herbs can be used.
- To support metabolism and liver function and prevent stress, disease and long recovery time, preparations containing vitamins, amino acids and butaphosphane are essential.

Racing pigeons

Some hints for a successful race:

- Be patient
- Provide a well balanced diet and a suitable loft

- Care should be taken when administering products to support the pigeon during the race. Make sure not to give many different products at the same time due to interactions between different ingredients. It is best to find a preparation which offers all the vitamins in one.
- If the pigeon was on any specific treatment it should be stopped at least 2 weeks before the race.
- For a blood thinning effect, let the pigeon drink lots of fresh water.
- Do not train the pigeons a day before the race to avoid losing energy.
- Amount of feed should be given according to amount of training done.
- Increase the amount of fat and carbohydrates in the feed as this is the main supply of energy during the race. Products which support lipid metabolism are useful before the race such as Caritin and B-complex vitamins.

Fish

The health of a fish can be maintained through simple diagnostic tests and observations. Monitoring for diseases and water quality before they set in is the most cost-effective method to prevent fish problems.

The fish's physiological processes are largely affected by changes in water temperature. The internal tissue of freshwater fish is hyperosmolar, meaning that the inside of the fish is more concentrated than fresh water, whereas for saltwater fish it is contrary, hypoosmolar. Fluid balance can be lost by surface injuries, since osmoregulation will be much more difficult.

Poor water quality predisposes the fish to environmentally induced diseases. It is essential to assess the basic parameters of water quality being;

- Dissolved gases
- Nitrogenous compounds
- Carbonate compounds
- Salinity

The requirements of these parameters vary according to different factors such as the type of system, stocking density and species. However, high levels of ammonia and low levels of dissolved oxygen are likely to lead to death. Chlorine is highly toxic to fish and the source is as simple as tap water. Colorimetric tests are available to measure the amount of chlorine in the aquarium, to prevent death by chlorine intoxification. The result should be zero or undetectable. Hydrogen sulphides result from sediments from; tanks which are not cleaned routinely and well water. This leads to areas in the tank which end up without oxygen. If household plumbing is made up of copper piping, there is a risk of copper ending up in your tank. This can result from copper being leaked into the water, especially if it is allowed to stand in pipes. Sufficient volumes can lead to death. However, there are 2 simple remedies; run the water before placing in the aquarium or use special filtration products such as activated charcoal.

Oxygen is the most important of dissolved gases. When fish end hypoxic (with low oxygen concentration) they move towards the surface of the aquarium. The amount of oxygen that an indoor tank can hold depends on 3 factors; altitude, water temperature and salinity. Oxygen level drops as any of these 3 variables increases,

water temperature being the most important variable. Special care should be taken during the hot summer months, since the risk of hypoxemia increases. Carbon dioxide toxicity is a problem observed mainly due to stocking density. The water system turns acidic, and can be detected by simple tests. The treatment for both oxygen deficiency and excess carbon dioxide is vigorous and increased aeration.

Degradation of fish food and excretions by the fish make entry to nitrogenous gases, because fish food is mainly composed of proteins. Ammonia is converted to nitrogen, which is a volatile liquid and thus can leave the system naturally, through a complex process. Ammonia can be increased in an aquarium by 2 factors; malfunction of the bacteria responsible to break down ammonia and overfeeding. This can be measured by ammonia test kits, and if it indicates high levels, action should be taken by changing at least half the water and moving the fish to a clean and pH-controlled aquarium.

For a marine aquarium, it is very important to maintain the correct salinity around 3%, since micronutrients which are present in sea water are essential. The salinity can be measured by a simple hydrometer and not the chloride test, because sometimes these 2 tests are confused.

Health, growth and reproductive development of the fish is highly determined by nutrition. Today, modifications to fish diets have been greatly made, and specific diets for specific species are available [51-53].

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List of Veterinary Clinics

All Animal Clinic
6, Triq ir-Raheb,
Tarxien, TXN 2144

Tel: 21 693 061
Mob: 99 420 158

Ambuserv Animal Ambulance
F/H 2, Sqaq Seguna,
Lija, LJA 1820

Mob: 99 333 112

Animal Aid Veterinary Clinic
49, Triq Oscar Zammit,
Msida, MSD 1282

Tel: 27 838 838

Animal Doctors
20, Triq Guze' Bajada,
Hamrun, HMR 2131

Tel: 21 233 011

Animal Wellness Centre
61, Triq il-Kbira,
Sliema

Mob: 77 851 025

Best Friends Veterinary Clinic
109, Triq Hal Luqa,
Paola, PLA 9043

Tel: 21 896 949

Blue Cross Veterinary Clinic
Triq il-Wied tal-Imsida,
Msida, MSD 9020

Tel: 21 492 174

Centru San Frangisk Animal Hospital
Ta' Qali,
Attard

Tel: 21 423 100
Mob: 79 830 935

Dr Trevor's Veterinary Clinic
56, Triq Kananea,
Attard, ATD 2705

Tel: 21 423 100

Galea Veterinary Clinic Gozo
Triq Wied is-Seqer,
Victoria, Gozo, VCT 2801

Tel: 21 554 257

Happy Paws Clinic
41, Triq is-Salib tal-Marsa,
Marsa, MRS 1548

Tel: 21 227 127

Healthy Pets Veterinary Clinic
Triq Fleur De Lys,
Birkirakara, BKR 9068

Mob: 79 278 495

Highrise Veterinary Clinic
Triq l-imradd,
Ta' Xbiex, XBX 1150

Tel: 21 322 150

Pets Veterinary Clinic
28, Triq Wied il-Ghajn,
Zabbar, ZBR 2701

Tel: 21 896 897

Qormi Veterinary Clinic
3, Triq Santu Rokku,
Qormi, QRM 2344

Tel: 21 480 480

St Simon Veterinary Practice
53, Triq Grognet,
Mosta, MST 3611

Tel: 21 432 280
Mob: 79 472 542, 99 478 289

The Professional Centre,
Malta Veterinary Association
Triq tas-Sliema,
Gzira

Tel: 52 502 000

VetPlus Services
St Jacob, Triq ic-Cawsli,
Qormi, QRM 3900

Tel: 27 296 550
Mob: 79 296 550

St Ann Vet Clinic
Triq il-Faxxina,
Swieqi, SWQ 3042

Tel: 21 385 455

The Animal Doctor
Triq Karlu Galea,
Victoria, Gozo, VCT 2605

Mob: 99 823 658

VetCare Animal Clinic
Misrah Lourdes,
San Gwann, SGN 2010

Tel: 21 373 277

Vets at Home
1, Triq Frangisk Xerri,
Birkirkara, BKR 1020

Mob: 99 922 777

List of Veterinary Pharmacies

Agrimed LTD
Triq l-Imdina,
Zebbug, ZBG 9016

Tel: 21 465 797

Animal Pharm
Triq il-Papa Piju XII,
Birkirkara, BKR 1403

Tel: 21 449 058

Central Veterinary Pharmacy
Carina Showroom, Triq Valletta,
Qormi, QRM 3617

Tel: 27 440 606

FarmCare Tas-Salib
Regent Building, Triq it-Tigrija,
Marsa, MRS 1633

Tel: 21 255 100

PharmaVet
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Anthrax

Anhrax, a highly infectious and fatal disease of cattle, is caused by a relatively large spore-forming rectangular shaped bacterium called *Bacillus anthracis*. Anthrax causes acute mortality in ruminants. The bacteria produce extremely potent toxins which are responsible for the ill effects, causing a high mortality rate. Signs of the illness usually appear 3 to 7 days after the spores are swallowed or inhaled. Once signs begin in animals, they usually die within two days.
Hoofed animals, such as deer, cattle, goats, and sheep, are the main animals affected by this disease. They usually get the disease by swallowing anthrax spores while grazing on pasture contaminated (made impure) with anthrax spores. Inhaling (breathing in) the spores, which are odorless, colorless, and tasteless, may also cause infection in animals and people.
Symptoms:

- Sudden death (often within 2 or 3 hours of being apparently normal) is by far the most common sign;
- Very occasionally some animals may show trembling, a high temperature
- Difficulty breathing, collapse and convulsions before death. This usually occurs over a period of 24 hours;
- After death blood, may not clot, resulting in a small amount of bloody discharge from the nose, mouth and other openings

Treatment and control

- Due to the acute nature of the disease resulting in sudden death, treatment is usually not possible in animals even though Anthrax bacilli are clines. Treatment is of use in cases showing sub-acute form of the disease.
- In most cases, early treatment can cure anthrax. The cutaneous (skin) form of anthrax can be treated with common antibiotics.

Preventive measures:

- Regular annual vaccination of animals in endemic areas will prevent the disease from occurring.
- Vaccination may be carried out at least a month prior to expected disease occurrence in endemic areas.
- Never open a carcass of an animal suspected to have died from anthrax.

Contact a veterinarian immediately if the following symptoms are seen and seek advice on control measures to be adopted.

- Fever (106-108°F), loss of appetite, depression and dullness
- Suspended rumination3. Rapid pulse and heart rates
- Difficult breathing (dyspnoea)
- Lameness in affected leg
- Crepitation swelling over hip, back & shoulder
- Swelling is hot & painful in early stages whereas cold and painless inter.
- Recumbency (prostration) followed by death within 12-48 hrs.

Black quarter (black-leg)

It is an acute infectious and highly fatal, bacterial disease of cattle. Buffaloes, sheep and goats are also affected. Young cattle between 6-24 months of age, in good body condition are mostly affected. It is soil-borne infection which generally occurs during rainy season. In India, the disease is sporadic (1-2 animal) in nature.
Causal organism: it is a bacterial disease caused by *Clostridium chauvoei*
Symptoms:

- Fever (106-108°F), Loss of appetite, Depression and dullness
- Suspended rumination
- Rapid pulse and heart rates
- Difficult breathing (dyspnoea)
- Lameness in affected leg
- Crepitation swelling over hip, back & shoulder
- Swelling is hot & painful in early stages whereas cold and painless inter.
- Recumbency (prostration) followed by death within 12-48 hrs.

Treatment:

- Early treatment can be possible to complete cure of the animal.
- Consult with veterinarian immediately.

Ethnovet practice :
The following measure is to be taken up in the month of May / June every year.
Exudates of thirugukalli (*Euphorbia tirucalli*), kodikalli (*Sareostemma brevistigma*), aththi (*Ficus racemosa*), banyan tree (*Ficus bengalensis*), madara (*Calotropis gigantea*) are taken at the rate of 1 to 15 drops each in a stainless-steel vessel and mixed with 50 ml of sesame oil and ragi flour are added and made into a paste. This paste is applied as dot (coin size) in each animal in the groin region. (the above material may be used for about 50 animals).

Foot and mouth disease

The foot-and-mouth disease is a highly communicable disease affecting cloven-footed animals. It is characterized by fever, formation of vesicles and blisters in the mouth, udder, teats and on the skin between the toes and above the hoofs. Animals recovered from the disease present a characteristically rough coat and deformation of the hoof.
In India, the disease is widespread and assumes a position of importance in livestock industry. The disease spreads by direct contact or indirectly through infected water, manure, hay and pastures. It is also conveyed by cattle attendants. It is known to spread through recovered animals, field rats, porcupines and birds.
Symptoms

- fever with 104-105o F
- profuse salivation - ropes of stringy saliva hangs from mouth
- vesicles appear in mouth and in the inter digital space

- lameness observed
- cross bred cattle are highly susceptible to it

Treatment

- the external application of antiseptics contributes to the healing of the ulcers and wards off attacks by flies.
- a common and inexpensive dressing for the lesions in the feet is a mixture of coal-tar and copper sulphate in the proportion of 5:1.

Precautions

- heavy milch animals and exotic breeds of cattle bred for milk should be protected regularly.
- it is advisable to carry out two vaccinations at an interval of six months followed by an annual vaccination programme.
- isolation and segregation of sick animals. It should be informed immediately to the veterinary doctor
- disinfection of animal sheds with bleaching powder or phenol
- attendants and equipment's for sick animals should be ideally separate
- the equipment's should be thoroughly sanitized
- proper disposal of left over feed by the animal
- proper disposal of carcasses
- control of flies

Ethnovet prevention practice:
When there is a outbreak in the nearby villages /surroundings take tulasi (*Ocimum sp*) leaves 100 gm, a pinch of common salt and turmeric rhizome 2 pieces and grind them. This has to be squeezed to obtain extract and administered orally. The residues left over can be used for smearing over the mouth region, foot region. This is repeated.

Rabies (Mad dog disease)

Rabies is a disease of dogs, foxes, wolves, hyaenas and in some places, it is a disease of bats which feed on blood.
The disease is passed to other animals or to people if they are bitten by an animal with rabies. The germs which cause rabies live in the saliva of the sick (rabid) animal. This is a killer disease but not every dog which bites is infected with rabies.
When the rabid animal bites another animal or human, the germs which live in its saliva pass into the body through the wound caused by the bite. The germs travel along the nerves to the brain. The time between the bite and the first appearance of signs that the bitten animal or human has been infected can take from 2 to 10 weeks or more. The time taken depends on the distance of the bite from the brain. If the bite is on the face or head, the bitten animal or human will quickly show signs, but if the bite is on the leg it will take much longer for signs to develop.
General signs of rabies
You should first look for the marks of the bite and discover where and when the animal was bitten. All rabid animals show similar signs in the beginning.

- they change their normal behaviour and behave very strangely.
- They stop eating or drinking.
- Male animal will try to mate (mount) other animals.
- there is no change in the body temperature.
- These signs will continue for 3 to 5 days. Then, before it dies, the animal will develop one or the other of two types of the disease:
    - the furious (mad) type of the disease makes the animal aggressive and it will bite anything.
    - The quiet (dumb) type when the animal is quiet and does not move.

Rabies in the dog
Dogs show either of the two types of rabies.

- a dog with the dumb or quiet type of the disease cannot move. It looks as if it has a bone stuck in the mouth and saliva drips from the mouth.
- rabies in the dog lasts about 10 days before the animal dies. If the animal does not die after this length of time then it may not be suffering from rabies.

Rabies in sheep, goats and cattle
Rabies is characterised by the animals becoming restless and excited. They may bite themselves and saliva drips from the mouth. The most important sign in cattle is that the animal bellows (calls) very frequently and with strange sound. The animals will become paralysed and die.
Rabies in the horse and camel
The horse will show the furious (mad) type of the disease. It will kick and bite and show signs similar to colic. The animal will die after paralysis of the back legs.
In the camel the signs of rabies are similar to those shown by an animal in the rut.
What to do with a biting dog
Remember that not every dog which bites has rabies. If the dog belongs to somebody ask the owner about its normal behaviour. If the dog is showing signs of rabies you must inform your veterinary officer immediately. The dog must be shot and if it has bitten anybody, they must be taken to a hospital immediately for vaccination.
Control of rabies
Dogs in your community can be vaccinated against rabies. You should ask your veterinary service about vaccination against rabies. If there is an outbreak of rabies, the livestock in your community can be vaccinated too.
Treatment (ethnovet practices) :
Leaves of chirchra (*Achyranthes aspera*) 100gm and onion 50 gm are ground well and smeared over the bitten place. The extract of these ingredients is administered orally twice in a day.

Blue tongue

Bluetongue, a disease which is transmitted by midges, infects domestic and wild ruminants and also camelids, however sheep are particularly badly affected. Cattle, although infected more frequently than sheep, do not always show signs of disease. Virus spreads between animals occurs via the midges of Cullicoides species.

The likelihood of mechanical transmission between herds and flocks, or indeed within a herd or flock, by unhygienic practices (the use of contaminated surgical equipment or hypodermic needles) may be a possibility.
Clinical signs include:
Sheep : eye and nasal discharges, drooling, high body temperature, swelling in mouth, head and neck, lameness and wasting of muscles in hind legs, haemorrages into or under skin, inflammation of the coronary band, respiratory problems, fever, lethargy.
In cattle : nasal discharge, swelling of head and neck, conjunctivitis, swelling inside and ulceration of the mouth, swollen teats, tiredness, saliva drooling, fever.
Note: a blue tongue is rarely a clinical sign of infection
Control :
Inspect stock closely, particularly focusing on the lining of the mouth and nose and the coronary band (where the hoof stops and the skin starts). If an animal is suspected as having bluetongue, it must be reported as quickly as possible. Telephone your local animal health office immediately.
Preventive measures and treatment (ethovet):
Since the animal is not taking any feed the starvation may lead to death. So the animal has to be administered orally the following food. Banana fruits (one) smeared with sesame oil (50 ml) for 2 to 3 times. By this animal will recover little. However, this will not control the disease fully. Next the leaf pulp of "sothukathalai"(Aloe vera) has to be administered daily. Administering of Aloe vera has to be continued for more days till the animal fully recovers from this disease. By this treatment the infected animal will recover from the disease. The disease will not spread to other animals if all animals are administered with Aloe vera as a preventive treatment. Administering aloe vera also increases the body weight of animals as it is against all intestinal parasite.

Pox

Epidemiology : sheep-pox is a highly contagious disease. It causes a mortality of 20 to 50 per cent in animals below the age of 6 months, and causes damage to the wool and skin in adults. Of the pock diseases, sheep-pox ranks only second to human small-pox in virulence. The disease is transmissible to in-contact goats but not to other species of animals. It, however, spreads slowly.
Symptoms : The disease in characterized by high fever, and symptoms of pneumonia and acute enteritis. Skin lesions appear particularly in parts free from wool, notably around the eyes, inner side of the thigh, udder and under surface of the tail. The internal organs such as trachea, lungs, kidneys and intestines are also affected. The disease results in emaciation and, as already mentioned, frequent deaths of affected animals.
Treatment, prevention and control :
The diseased animal should be treated with palliatives. In the young ones nursing is more important than medication. The infected litter should be burnt and the bedding changed every day. Affected animals should be kept on soft diet. The ulcers on the skin should be washed with potassium permanganate lotion and dusted with boric acid; strict hygienic measures should be adopted.
Preventive measures and treatment (ethnovet):
External application of paste prepared by grinding neem leaves, tulsi leaves each 100 gm and turmeric powder- 50gm sprinkled with sufficient water. Continue for 3 to 5 days. Administer orally the same mixture by diluting with water.

Brucellosis of sheep

Transmission : The mode of entry is by ingestion or via conjunctiva. The aborted foetus, vaginal discharge and milk from infected goats contain a large number or organisms.
Symptoms in infected goats and sheep state of abortion may occur followed by a quiescent period during which a few abortions occur. The aborted animals do not breed. After 2 years or more another abortion storm is likely to occur.
Diagnosis, treatment and control:
It is not possible to diagnose brucellosis on the basis of symptoms alone. The suspicion is aroused when humans in contact suffer from undulant fever and there is poor breeding record in goat herd and evidence of mastitis. The diagnosis can be done by the isolation of organisms and by serological tests.
There is no adequate treatment:
This is based on hygiene, vaccination, testing and disposal. Good management practice is essential. Separate quarters should be provided for kidding. Immunization can be done with attenuated as well as killed vaccines. The test and disposal procedure is highly desirable.

Tetanus

This is an infectious, non-febrile disease of animals and man, and is characterized by spasmodic tetany and hyperaesthesia. This disease is prevalent all over the world.
Transmission : Infection takes place by contamination of wounds. Deep punctured wounds provide favourable conditions for the spores to germinate, multiply and produce toxin which is subsequently absorbed in the animal body. The micro-organism is present in soil and in animal faeces, and is carried into the wound by a penetrating object. The organism is present in the intestine of normal animals, and under some undetermined conditions multiplies rapidly and produces toxin in sufficient quantities to be absorbed and cause the disease.
Symptoms : The incubation period is generally 1-2 weeks but it may be as short as 3 days. Tetanus affects many species of domesticated animals but occurs particularly in horses and lambs; less frequently in adult sheep, goats, cattle, pigs, dog and cats; and rarely in poultry. The initial symptoms are mild stiffness and an unwillingness to move all the animals. More severe symptoms develop after 12-24 hours which are stiffness of limbs, neck, head, tail and twitching of muscles. The spasms develop in response to noise. In terminal stages ears are erect, nostrils dilated, nictitating membrane protruded. Mastication becomes very difficult because mouth cannot be opened, hence the name lockjaw.
Treatment : The treatment is carried out by first injecting antitoxin then treating the wound. Penicillin parenterally is beneficial. Muscular relaxation is achieved by injection of relaxants. The animal should be kept in a dark room and fed with the help of stomach tube.
Control : Proper hygiene and cleanliness at castration and other surgical procedures should be observed. Sheep should be given 2 injections based 3 weeks apart to develop a solid immunity.

Listeriosis

Transmission : The organisms are excreted in the faeces, urine, aborted foetuses, uterine discharge and milk of infected animals. The organisms are sufficiently resistant to remain viable in animal and

human faeces, sewage, soil, silage and dust foe several weeks and months. The blood sucking arthropods may spread infection since organisms have been isolated from cattle ticks and tabanid flies. Under natural conditions certain predisposing factors are related to clinical infection.
Symptoms : In farm animals the disease occurs towards the end of winter or early spring. The first signs of meningo- encephalitis are stiffness of neck, incoordinated movement of limbs and tendency to move in circles or to lean against a fence or wall. There may be paralysis of muscles of jaw and pharynx. Incoordination becomes progressively more severe until the animal can no longer stand. The cattle which are not severely affected may survive. Abortions in cattle usually occur after 4-8 months of pregnancy and at a comparatively later stage in sheep. In pigs and horses, clinical signs are not common but may develop as encephalitis and septicaemia. In poultry, the disease usually causes sudden death, occasionally there are signs of torticollis, weakness and inco-ordination of the legs.
Treatment : Tetracyclines are very effective in meningo-encephalities of cattle less so in sheep. The recovery rate depends on the speed with which the treatment is commenced.
Control : When outbreaks occur all affected animals should be slaughtered and buried along with litter and bedding. The vaccines, living or killed, have little effect on the pathogenesis of infection under natural conditions, tetracycline's are very effective for treatment of listeriosis.

Campylobactor abortion (vibriosis)

Transmission : transmission occurs by coitus. The affected bulls carry the organisms in preputial cavity indefinitely. Mature cows and heifers also carry the infection for long periods. Infected semen from an infected bull is the important means of the disease. The organism survives low temperature used in semen storage.
Symptoms : infertility may cause become apparent only when the percentage of pregnancies in a dairy herd is low. The infertility rate in heifers is more than in cows. Abortions usually occur between fifth and sixth month of pregnancy. Infected bulls show no symptoms and their semen is normal. Healthy bulls become infected during coitus with diseased cow. Among sheep the disease is characterized by abortion occurring towards the end of gestation. Usually abortion is preceded by vaginal discharge for several days. The aborted foetus is edematous with petechial hemorrhages on serous surfaces and necrotic foci in the liver.
Control ; abortion rate can be reduced by antibiotic therapy, and particularly by using chlortetracycline and concurrently with the development of specific immunity. The use of killed vaccines may reduce the incidence of disease in a herd but does not eradicate the infection. The bulls can be treated by injecting antibiotic cream in the prepuce. There is no direct treatment of females.

Johne`s disease

Johne`s disease is a specific chronic contagious enteritis of cattle, sheep, goat, buffaloes and occasionally of pigs. The disease is characterized by progressive emaciation and in cattle and buffaloes by chronic diarrhea and thickening of the intestine.
Transmission under natural conditions the disease spread by ingestion of feed and water contaminated by the faeces of infected animals. The infection occurs mostly in the early month of life. The incubation period extends from 12 months to several years. The animal aged 3 to 6 years mostly suffer from the disease. Affected animals may not show clinical symptoms continue to

discharge organisms in faeces. The organisms persist in pastures for about 1 year. The organisms are susceptible to sunlight, drying and high ph of soil; continuous contact of urine with faeces reduces the life of bacteria. In cattle clinical signs appear mainly during 2-6 years of age. The infected animals which are apparently healthy, often show clinical signs after parturition.
Treatment the organisms is more resistant to chemotherapeutic agents invitro than mycotuberculosis. Because of this the practical utility of treatment in clinical cases is poor.
Control the affected animal should be segregated and their faeces properly disposed off. Alive vaccine has been developed. It reduces the incidence of clinical disease. It consists of a non-pathogenic strain of jhone`s bacillus with an adjuvant. The calves soon after birth are inoculated with vaccine subcontaneously. The vaccinated animals become reactors of jhonin. Vaccination is generally done in heavily infected herds.

Bovine ephemeral fever

Bovine ephemeral fever is an insect-transmitted, noncontagious, viral disease of cattle and water buffalo that is seen in Africa, the middle east, Australia, and Asia.
Etiology and epidemiology
Bovine ephemeral fever virus (befv) is classified as a member of the genus Ephemerovirus in the family Rhabdoviridae (single-stranded, negative sense rna)
The prevalence, geographic range, and severity of the disease vary from year to year, and epidemics occur periodically. During epidemics, onset is rapid; many animals are affected within days or 2–3 wk. Bovine ephemeral fever is most prevalent in the wet season in the tropics and in summer to early autumn in the subtropics or temperate regions (when conditions favor multiplication of biting insects); it disappears abruptly in winter. Virus spread appears to be limited by latitude rather than topography or availability of susceptible hosts. Morbidity may be as high as 80%; overall mortality is usually 1%–2%, although it can be higher in lactating cows, bulls in good condition, and fat steers (10%–30%).
Clinical findings
Signs, which occur suddenly and vary in severity, can include biphasic to polyphasic fever (40°–42°C [104°–107.6° F), shivering, inappetence, lacrimation, serous nasal discharge, drooling, increased heart rate, tachypnea or dyspnea, atony of forestomachs, depression, stiffness and lameness, and a sudden decrease in milk yield.
Affected cattle may become recumbent and paralyzed for 8 hr to >1 wk. After recovery, milk production often fails to return to normal levels until the next lactation. Abortion, with total loss of the season's lactation, occurs in about 5% of cows pregnant for 8–9 months. The virus does not appear to cross the placenta or affect the fertility of the cow. Bulls, heavy cattle, and high-lactating dairy cows are the most severely affected, but spontaneous recovery usually occurs within a few days. More insidious losses may result from decreased muscle mass and lowered fertility in bulls.

Lesions

The most common lesions include polyserositis affecting pleural, pericardial, and peritoneal surfaces; serofibrinous polysynovitis, polyarthritis, polytendinitis, and cellulitis; and focal necrosis of skeletal muscles. Generalized edema of lymph nodes and lungs, as well as atelectasis, also may be present.
Treatment and control

Complete rest is the most effective treatment, and recovering animals should not be stressed or worked because relapse is likely. Anti-inflammatory drugs given early and in repeated doses for 2–3 days are effective. Oral dosing should be avoided unless the swallowing reflex is functional. Signs of hypocalcemia are treated as for milk fever. Antibiotic treatment to control secondary infection and rehydration with isotonic fluids may be warranted.

Rinderpest

Rinderpest is the most destructive of the virus diseases of cloven-footed animals, such as cattle, buffaloes, sheep, goats, pigs and wild ruminants. The virus is found notable in the saliva, discharge from eyes and nostrils, and in the urine and faeces. It is present in the circulating blood during the febrile stage and is later concentrated in different organs, especially in the spleen, lymph nodes and liver. Outside the animal body, the virus is rapidly destroyed by direct sunlight and disinfectants. Cold preserves the virus. The virus is usually spread by contaminated feed and water. Rise in temperature up to 104 – 107 degree F. Lacrimation and redness of eye. Foul odour from mouth. Discrete necrotic foci develop in the buccal mucosa, inside lip, and on the tongue. Bloody mucoid diarrhea is noticed
Treatment:
Symptomatic treatment can be help early cure of the animals. Consult with veterinary doctor

Mastitis

Mastitis, or inflammation of the mammary gland, is the most common and the most expensive disease of dairy cattle throughout most of the world. Although stress and physical injuries may cause inflammation of the gland, infection by invading bacteria or other microorganisms (fungi, yeasts and possibly viruses) is the primary cause of mastitis. Infections begin when microorganisms penetrate the teat canal and multiply in the mammary gland.
Treatment

- success depends on the nature of the aetiological agent involved, the severity of the disease and the extent of fibrosis.
- complete recovery with freedom from bacterial infection can be obtained in cases of recent infection and in those where fibrosis has taken place only to a small extent.
- such drugs as acriflavine, gramicidin and tyrothricin have now ceased to be in use, and have given place to the more effective drugs, such as sulphonamides, penicillin and streptomycin.

Footrot

Foot rot is a common cause of lameness in cattle and occurs most frequently when cattle on pasture are forced to walk through mud to obtain water and feed. However, it may occur among cattle in paddocks as well, under apparently excellent conditions. Foot rot is caused when a cut or scratch in the skin allows infection to penetrate between the claws or around the top of the hoof. Individual cases should be kept in a dry place and treated promptly with medication as directed by a veterinarian. If the disease becomes a herd problem a foot bath containing a 5% solution of copper sulphate placed where cattle are forced to walk though it once or twice a day will help to reduce the number of new infections. In addition, drain mud holes and cement areas around the water troughs

where cattle are likely to pick up the infection. Keep pens and areas where cattle gather as clean as possible. Proper nutrition regarding protein, minerals and vitamins will maximize hoof health.

Bovine rhinotracheitis

Infectious bovine rhinotracheitis (ibr) is a highly contagious, infectious respiratory disease that is caused by bovine herpesvirus-1 (bhv-1). It can affect young and older cattle. In addition to causing respiratory disease, this virus can cause conjunctivitis, abortions, encephalitis, and generalised systemic infections. Ibr is characterized by acute inflammation of the upper respiratory tract.

Treatment

There is no direct treatment for viral diseases. Infected animals should be isolated from the rest of the herd and treated with anti-inflammatory drugs and antibiotics for secondary infections if necessary. Carrier cattle should be identified and removed from the herd.

Prevention

Control of the disease is based on the use of vaccines.

Piglet diarrhea or scour

Of all the diseases in the sucking piglet, diarrhea is the most common and probably the most important. In some outbreaks, it is responsible for high morbidity and mortality. The main bacterial causes are E. Coli and Clostridia and the main parasite is Coccidia.

Clinical signs

Scour in the piglet can occur at any age during sucking but there are often two peak periods, before 5 days and between 7 and 14 days.

Acute disease

The only sign may be a perfectly good pig found dead. Post-mortem examinations show severe acute enteritis, so sudden that there may be no evidence of scour externally. Clinically affected piglets huddle together shivering or lie in a corner. The skin around the rectum and tail will be wet. Look around the pen for evidence of a watery to salad cream consistency scour. In many cases, there is a distinctive smell. As the diarrhea progresses the piglet becomes dehydrated, with sunken eyes and a thick leathery skin. The scour often sticks to the skin of other piglets giving them an orange to white color.

Prior to death piglets may be found on their sides paddling and frothing at the mouth.

Sub-acute disease:

The symptoms are similar but the effects on the piglet are less dramatic, more prolonged and mortality tends to be lower. This type of scour is often seen between 7 to 14 days of age manifest by a watery to thin salad cream consistency diarrhea, often white to yellow in color.

Treatment

- in severe outbreaks of E. Coli disease the sows feed can be top dressed with the appropriate antibiotic daily, from entry into the farrowing house and for up to 14 days post-farrowing. This can be effective in reducing bacterial output in the sows faeces.
- observe litters for the presence of diarrhea both night and morning.
- study the history of the disease on your farm. Is it sporadic, in one piglet in a litter, or total litters?

- in the light of the history either treat the individual pig or on the first signs of disease treat the whole litter.
- if a litter is badly scoured dose night and morning for a minimum of two days.
- assess the response to treatment. If there is no change within 12 hours, then change to another medicine as advised by your veterinarian.
- always treat piglets less than 7 days of age by mouth.
- for older pigs where the disease is less acute injections are equally effective and easier to administer.
- provide electrolytes in drinkers. These prevent dehydration and maintain body electrolyte balances.
- cover the pen, the creep area and where the pigs defecate with straw, shredded paper, shavings or sawdust.
- provide an additional lamp to provide an extra source of heat.
- use binding agents such as chalk, kaolin or activated attapulgite to absorb toxins from the gut.

Management control and prevention

- adopt procedures to prevent the spread of the scour - disinfect boots between pens, use a disposable plastic apron when dosing piglets to prevent heavy contamination of clothing, wash hands after handling a scoured litter, disinfect brushes and shovels between pen.
- ensure that farrowing houses are only used on an all-in all-out basis with a pressure wash and disinfection between each batch.
- farrowing pens must be dry before the house is repopulated. Remember that moisture, warmth, waste food and faeces are ideal for bacterial multiplication.
- pen floors should be well maintained. Poor pen hygiene associated with bad drainage predisposes to scour.
- look carefully at the part of the pen floor where there are piglet faeces. Is this poorly drained? Do large wet patches develop? If so cover them with extra bedding daily and remove. This is a most important aspect of control.
- check nipple drinkers and feeding troughs for leakages.
- ensure that faeces are removed daily from behind the sow from the day she enters the farrowing crates until at least 7 days post-farrowing if the floors are slatted. Also remove faeces daily throughout lactation if they are solid concrete.
- maintain creep environments that are always warm and comfortable. Fluctuating temperatures are a major trigger factor to scour particularly from 7 to 14 days of age.
- consider vaccinating against E. Coli (make sure first that this is the cause of the problem however). E. Coli vaccines only protect the piglet for the first 5 to 7 days of age.
- assess the environment of all the farrowing house. Poor environments allow heavy bacterial multiplication and a much higher bacterial challenge is likely to break down the colostral immunity.
- check the sow's health. Animals affected with enteric or respiratory disease, lameness or mastitis predispose the litter to scour.
- where farrowing house floors are very poor, pitted and difficult to clean, brush them over with lime wash containing a phenolic disinfectant.
- Colostrum management : it is vital that the piglet receives the maximum amount of colostrum within the first 12 hours of birth. High levels of antibody are only absorbed during this period.

Factors such as poor teat access, poor crate design, and particularly the development of agalactia in the sow, associated with udder oedema, reduce intake.

PPR (goat plague)

PPR (Peste des petits ruminants) is a most important viral disease of goat capable of heavy mortality and commonly called as goat plague.

Etiology

The causative virus was first thought to be an aberrant strain of rinderpest virus that had lost its ability to infect cattle. Later molecular studies showed that it was distinct from, but closely related to, rinderpest virus.

Clinical signs:

The clinical sign of PPR in goats is often fulminating and fatal although apparent infection occurs in endemic areas. Incubation period may range from 2-6 days in field conditions. In acute form, there is sudden onset of fever with rectal temperature of at least 40°- 41°C. The affected goats show dullness, sneezing, serous discharge from the eyes and nostrils. During this stage farmers often think that the animal has developed cold exposure and may attempt to provide protection for cold. In the process goats, may be congregated and accentuate the process of transmission. After 2-3 days, discrete lesions develop in the mouth and extend over the entire oral mucosa, forming diphtheric plaques.

During this stage profound halitosis (foul smell) is easily appreciable and the animal is unable to eat due to sore mouth and swollen lips. Latter ocular discharge becomes mucopurulent and the exudate dries up, matting the eyelids and partially occluding the nostrils. Diarrhea develops 3-4 days after the fever and is profuse and faeces may be mucoid or bloody depending upon the damage. Dyspnea and coughing occur later due to secondary pneumonia. Death occurs within one week of the onset of the illness.

Treatment and control:

No specific treatment is recommended for ppr being viral disease. However, mortality rates can be reduced by the use of drugs that control the bacterial and parasitic complications. Specifically, oxytetracycline and chlortetracycline are recommended to prevent secondary pulmonary infections. Lesions around the eyes, nostrils and mouth should be cleaned twice daily with sterile cotton swab. Our experience indicates that fluid therapy and anti-microbial such as enrofloxacin or ceftiofur on recommended doses along with mouth wash with 5% boro-glycerine can be of benefit in reducing the mortality during outbreak of ppr in goats. Health workers should inspect first the unaffected goats followed by treatment of affected goats. Immediate isolation of affected goats from clinically healthy goats is most importance measure in controlling the spread of infection. Nutritious soft, moist, palatable diet should be given to the affected goats. Provide parenteral energy infusion in anorectic goats along with appetizers.

Immediately measures should be taken for notification of disease to nearest government veterinary hospital. Carcasses of affected goats should be burned or buried. Proper disposal of contact fomites, decontamination is must. Vaccination is the most effective way to control ppr.

Bovine babesiosis (tick fever)

Cause

Bovine babesiosis (bb) is a tick-borne disease of cattle. Transmission of b bovis takes place when engorging adult female ticks pick up the infection. They pass it on to their progeny via their eggs. Larvae (or seed ticks) then pass it on in turn when feeding on another animal. B bigemina is also passed from one generation of ticks to the next. Engorging adult ticks pick up the infection and nymphal and adult stages (not larval stages) of the next generation pass it on to other cattle. Morbidity and mortality vary greatly and are influenced by prevailing treatments employed in an area, previous exposure to a species/strain of parasite, and vaccination status. In endemic areas, cattle become infected at a young age and develop a long-term immunity. However, outbreaks can occur in these endemic areas if exposure to ticks by young animals is interrupted or immuno-naïve cattle are introduced. The introduction of babesia infected ticks into previously tick-free areas may also lead to outbreaks of disease.
Symptoms:

- high fever
- neurologic signs such as incoordination, teeth grinding and mania. Some cattle may be found on the ground with the involuntary movements of the legs. When the nervous symptoms of cerebral babesiosis develop, the outcome is almost always fatal.
- dark colored urine
- anorexia
- animals likely to separate from herd, be weak, depressed and reluctant to move
- n b. Bigemina parasitaemia often exceeds 10 per cent and may be as high as 30 per cent.

Clinical symptoms for babesia divergens are similar to b. Bigemina infections. The survivors may be weak and in reduced condition, although they usually recover fully. Subacute infections, with less apparent clinical signs, are also seen.
Treatment
Mild cases may recover without treatment. Sick animals can be treated with an antiparasitic drug. Treatment is most likely to be successful if the disease is diagnosed early; it may fail if the animal has been weakened by anemia. Imidocarb has been reported to protect animals from disease but immunity can develop. There are also concerns with regard to residues in milk and meat. In some cases blood transfusions and other supportive therapy should be considered.
Prevention
Effective control of tick fevers has been achieved by a combination of measures directed at both the disease and the tick vector. Tick control by acaracide dipping is widely used in endemic areas. Dipping may be done as frequently as every 4-6 weeks in heavily infested areas. The occurrence of resistance of ticks, chemical residues in cattle and environmental concerns over the continued use of insecticides has led to use of integrated strategies for tick control. Babesiosis vaccines are readily available and are highly effective. Anti-tick vaccines are also available in some countries and can be used as part of an integrated program for the control of ticks. Babesiosis can be eradicated by eliminating the host tick(s). In the us, this was accomplished by treating all cattle every two to three weeks with acaricides. In countries where eradication is not feasible, tick control can reduce the incidence of disease.
Treatment for control of tick (ethnovet):
Mix common salt and few camphor in castor oil or neem oil and apply over the affected area. Whole plant extract of ghaner (lantana camara) should be diluted with the urine of cattle and apply

externally. Boil 250 gm of tobacco in 2 litres of water and add 5 litres of water and sprayed over the body of 10-20 animals.

Theileriosis

Theileriases are a group of tickborne diseases caused by theileria spp. Both theileria and babesia are members of the suborder piroplasmorina. Although babesia are primarily parasites of rbcs, theileria use, successively, wbcs and rbcs for completion of their life cycle in mammalian hosts. The infective sporozoite stage of the parasite is transmitted in the saliva of infected ticks as they feed. Sporozoites invade leukocytes and, within a few days, develop to schizonts. In the most pathogenic species of theileria (eg, t parva and t annulata), parasite multiplication occurs predominantly within the host wbcs, whereas less pathogenic species multiply mainly in rbcs. Development of the schizont stage of pathogenic theileria causes the host wbc to divide; at each cell division, the parasite also divides. Mortality in such stock is relatively low, but introduced cattle are particularly vulnerable. Unlike in babesiosis, in theileriasis there is no evidence of increased resistance in calves <6 mo old.

East coast fever

East coast fever, an acute disease of cattle, is usually characterized by high fever, swelling of the lymph nodes, dyspnea, and high mortality. Caused by theileria parva, and transmitted by the tick vector rhipicephalus appendiculatus, it is a serious problem in east and southern africa.

Etiology and transmission

The african buffalo (syncerus caffer) is an important wildlife reservoir of t parva, but infection is asymptomatic in buffalo. T parva transmitted by ticks from either cattle or buffalo cause severe disease in cattle, but buffalo-derived parasites differentiate poorly to merozoites in cattle and generally are not transmitted by ticks. Hence, buffalo t parva are maintained as a separate population. Buffalo t parvawere previously considered a separate subspecies (t parva lawrencei), but dna typing indicate that the cattle and buffalo parasites are a single species. T parva is usually highly pathogenic, causing high levels of mortality, although some less pathogenic isolates have been identified.

Pathogenesis, clinical findings, and diagnosis

T parva sporozoites are injected into cattle by infected vector ticks. An occult phase of 5–10 days follows before infected lymphocytes can be detected in giemsa-stained smears of cells aspirated from the local draining lymph node. Subsequently, the number of parasitized cells increases rapidly throughout the lymphoid system, and from about day 14 onward, cells undergoing merogony are observed. This is associated with widespread lymphocytolysis, marked lymphoid depletion, and leukopenia. Piroplasms in rbcs infected by the resultant merozoites assume various forms, but typically they are small and rod-shaped or oval.

Clinical signs vary according to the level of challenge, and they range from in apparent or mild to severe and fatal. Typically, fever occurs 7–10 days after parasites are introduced by feeding ticks, continues throughout the course of infection, and may be >106°f (41°c). Lymph node swelling becomes pronounced and generalized. Lymphoblasts in giemsa-stained smears of needle aspirates from lymph nodes contain multinuclear schizonts. Anorexia develops, and the animal rapidly loses condition; lacrimation and nasal discharge may occur. Terminally, dyspnea is common. Just before death, a sharp decrease in body temperature is usual, and pulmonary exudate pours from the

nostrils. Death usually occurs 18–24 days after infection. The most striking postmortem lesions are lymph node enlargement and massive pulmonary edema and hyperemia. Hemorrhages are common on the serosal and mucosal surfaces of many organs, sometimes together with obvious areas of necrosis in the lymph nodes and thymus. Anemia is not a major diagnostic sign (as it is in babesiosis) because there is minimal division of the parasites in rbcs, and thus no massive destruction of them.
Animals that recover are immune to subsequent challenge with the same strains but may be susceptible to some heterologous strains. Most recovered or immunized animals remain carriers of the infection.
Treatment and control
Treatment with parvaquone and its derivative buparvaquone is highly effective when administered in the early stages of clinical disease but is less effective in the advanced stages, in which there is extensive destruction of lymphoid and hematopoietic tissues. Immunization of cattle against t parva using an infection-and-treatment procedure is practical and continues to gain acceptance in some regions. The components for this procedure are a cryopreserved sporozoite stabilate of the appropriate strain(s) oftheileria derived from infected ticks and a single dose of long-acting oxytetracycline given simultaneously; although oxytetracycline has little therapeutic effect when administered after development of disease, it inhibits development of the parasite when given at the outset of infection. Cattle should be immunized 3–4 wk before being allowed on infected pasture. Parasitized bovine cells containing the schizont stage of t parva and t annulata can be cultivated in vitro as continuously growing cell lines. In the case of t annulata, cattle can be infected with a few thousand cultured cells. Attenuated strains produced by serial passage of such cultures form the basis of live vaccines used in several countries, including israel, iran, india, and the former ussr. Incidence of east coast fever can be reduced by rigid tick control, but this is not feasible in many areas because of cost and the high frequency of acaricidal treatment required.

Ringworm

This is the most common infectious skin disease affecting beef cattle. It is caused by a fungus, and is transmissible to man. Typically, the disease appears as crusty grey patches usually in the region of the head and neck and particularly around the eyes.
As a first step in controlling the disease, it is recommended that, whenever possible, affected animals should be segregated and their pens or stalls cleaned and disinfected. Clean cattle which have been in contact with the disease should be watched closely for the appearance of lesions and treated promptly. Proper nutrition, particularly high levels of vitamin a, copper and zinc while not a cure, will help to raise the resistance of the animal and in so doing offer some measure of control. Contact your vet and or feed store for products to treat this disease. Using a wormer like ivomec will kill lice and help prevent cattle from scratching causing skin damage and a place for the fungus to enter.

Milk fever

Milk fever, also known as Parturient hypocalcaemia and parturient paresis, is a disease which has assumed considerable importance with the development of heavy milking cows. Decrease in the levels of ionized calcium in tissue fluids is basically the cause of the disease. In all adult cows, there is a fall in serum-calcium level with the onset of lactation at calving. The disease usually occurs in 5

to 10-year-old cows, and is chiefly caused by a sudden decrease in blood-calcium level, generally within 48 hours after calving.
Symptoms

- in classical cases, hypocalcaemia is the cause of clinical symptoms. Hypophosphataemia and variations in the concentration of serum-magnesium may play some subsidiary role.
- the clinical symptoms develop usually in one to three days after calving. They are characterized by loss of appetite, constipation and restlessness, but there is no rise in temperature.

Calf scour

Calves may develop scours due to bacterial or virus infections. Scours is known as "calf scours" or neonatal calf diarrhea. The primary causes of scours include: Rota virus, Corona virus, *Cryptosporidium parvum*, Salmonella and *Escherichia coli*.

- Determine if treatment is required. Calves that are moving around in the pasture, with their tails up, probably do not need treatment. Check to see if the diarrhea is yellow or white. If this is the case, treatment is probably not needed.
- Determine if the calf is looking listless. Calves that are lethargic or not participating much in the playful activities with other calves are a red flag to pay attention to. Calves that are also losing condition are also cause for alarm.
- Check to see if the calf is dehydrated. You can check for dehydration by pulling on the calf's neck skin. If the skin "tents" this is a sign of dehydration.
- Determine the calf's body temperature. A normal body temperature ranges from 100.5 °f (38.1 °c) to 102.5 °f (39.2 °c). Anything outside of this range is a sign for treatment.
- Separate the sick calf or calves from the healthy herd. You'll want to do this to avoid spreading the disease further.
- Administer fluids using your veterinarian-approved electrolyte solution. You may need to inject the fluids via iv or orally.
- Follow appropriate nursing care protocol using your vet's guidelines. This may include providing shelter, feed and a warm place to sleep.
- A drawback from providing shelter is maintaining infectious control. You will have to work extra to get rid of soiled bedding and disinfect everything that a calf will touch, from the floor to the fence panels and even the feed bucket.
- Enthnovet practice: *Ingredients needed*: vasambu (*Acorus calamus*) leaves 2 numbers, dried ginger (*Zingiber officinale*) 50 gm, guava (*Psidium guajava*) tender leaves 200 gm. The above materials are ground and made into a bolus and administered orally one or two times