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Small Ruminants Diseases and their Management in Winter Months

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Abstract

In small ruminants some diseases and conditions occur mostly during winter months. This may be due to winter stress, deficiency of feed, supplements and environmental parameters. Small ruminants like sheep and goats are reared mostly in village conditions are at the verge of several risk and etiological factors. These animals are highly susceptible to pneumonia of different aetiologies, Orf (contagious ecthyma), enterotoxaemia, paratuberculosis, parasitic infections bother external parasites and internal parasites, Hypothermia and hypoproteinemia. All these diseases can cause severe production loss, morbidity and mortality. This negative productivity traits can lead to high loss and closure of faming that may disrupts the survivability and livelihood of farmers. Prevention and control of these diseases with vaccine, feed and proper management.

Key words: Small ruminant, Sheep, Goat, Diseases

Introduction

Goat and sheep are common small domestic animals. They provide milk, meat, wool, hair, skin and manure and has enormous economic impact for rural animal farmers. Sheep is called the museum of diseases while goats are clean and fresh animals and are resistant to many diseases unlike sheep. Morbidity and mortality out of different infectious and non- infectious aetiologies during winter months (November to February) occurs due to poor health conditions out of nutritional, environmental stress and infectious agents. As a result, morbidity and mortality in winter seasons may increase. Following different conditions prevail in every year in small ruminant population.

Pneumonia

Predisposing factors-This is a common and very serious issue in cold weather in goat and sheep in particular. The stress of cold, poor air quality and ventilation in congested housing, and sudden weather changes like drops of temperature, hail storm, sudden rain, can predispose

goats to a combination.

Infections cause of pneumonia

Viral- Parainfluenza type 3, adenovirus, respiratory syncytial virus (RSV), parainfluenza type 3, Ovine progressive pneumonia virus (OPPV).

Bacterial- Bacteria are *Mannheimia haemolytica* ,*Pasteurella multocida,* different species of *Mycoplasma ovipneumonae, M. Mycoplasma capricolum subsp. Capripneumoniae* (Mondal, *et al,* 2004).Uncommon speceis are E.coli., Staphylococcus virus (sp, Chlamydia sp.

Parasites- Different worm infections like *Dictyocaulus filaria*, *Muellerius capillaris*, *Protostrongylus rufescens*.

Non-infectious-Inhalants, foreign bodies, several allergens, dust, mites, toxic gas (ammonia) and drenching pneumonia through liquid anthelminthics, drugs administration causes aspiratory pneumonia.

Impact of Stress -Nutritional stress, environmental stress, production stress, transportation stress etc.

Clinical signs-Primary coughing, dyspnoea, anorexia, rales, nasal discharges, fever, depression. In sheep sometimes large amount of mucous secretion drools from nasal orifices that causes dyspnoea. Diagnosis can be made by clinical signs, radiology

Treatment of pneumonia- Treatment against infections with susceptible antibiotics like Doxycycline, Ceftiofur, Enrofloxacin, Tylosine (mycoplasmosis), Amoxycillin+ Sulbactam, Penicillin + Streptomycin combination. Antipyretic to reduce hyperthermia like paracetamol, NASIDs (Flunixin Meglumine, ketoprofen,meloxicam,carprofen etc for fever and antinflammatory remission. For allergic reaction pheniramine maleate.Antiparasitic against respiratory infection are praziquantel, levamisole,lactones (ivermectin,doramectin etc), benzimidazole etc. Different stress may relax avoiding aetiologies, nutritional supplenent and balanced feed/fodder. Housing and ventillation may be corrected. Severe cases nebulization with corticosteoid and antibiotics provide early healing.

Orf /Contagious Ecthyma

The Para pox viral contagious ecthyma is not restricted to winter but prevalence in winter is much more in low age group of animals but it may happen in adults also worldwide. The highly contagious infection with easy transmission contacts newer hosts. Common in young reared artificially and confine areas and in older lambs during late summer, fall, and winter season on pasture, and during winter in feedlots animals (Spyrou and Valiakos, 2015). The disease is characterized by pustular dermatitis particularly in facial region and GI tract.

Clinical findings and Lesions

Initial clinical signs are salivation, lameness, and fever. Primary lesion at the mucocutaneous junction of the lips, mouth and erupting incisor teeth, and oral cavity. Sometimes lesions may be revealed on the feet, around the coronet and secondary complication with *Dermatophilus congolensis* leads to strawberry foot rot. Lactating ewes may develop lesions on teats and udder skin. Papules progress to form vesicular, pustular and crust formation. Combination pustular lesions lead to the formation of large scabs(fig-1).

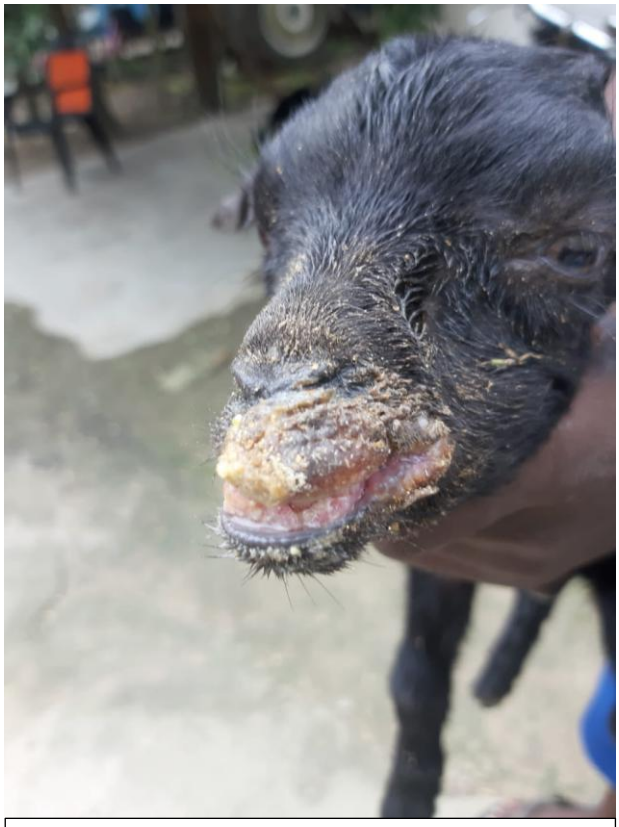

Fig-1: Orf lesions in mouth and lips in kid

Oral lesions may complicate with necrobacillosis co-morbidity.Disease course long 2-5 weeks, the scab heals without scar development. Severely affted animals unfed snd debiliated condition. Complication with lameness, mastitis, even gangrenous tissues on the teats. The disease may be confused with FMD, Bluetongue Sheep pox, ulcerative dermatitis and Poxes. The infection may transmit to human at hands and face like pock lesions. Once recovered it produced long protection for reinfection.

Diagnosis can be made by clinicopathological signs, viral isolation, molecular diagnostics and other means.

Treatment

Parenteral and tropical antibiotic therapy, antihistamines may be given to reduce itching and restrict various pro-inflammatory cytokines (TNF-alpha, IL-6, and IL-8 etc) production. Vitamin A may be given to proliferate skin cell production. Tropical antibacterial cream like D'mag, Himax, Meemax may be given to restrict secondary contamination. Liquid feed, water and mineral mixture may be fed orally.

Enterotoxaemia (Overeating Disease)

Enterotoxaemia in small ruminants is a potential bacterial toxin related disease. It is due facultative over growth of *Clostridium perfingens* D in the GIT, releases potential α-toxin, β-toxin, ε-toxin, ï-toxin, *Cl. perfringens* enterotoxin, and necrotic enteritis B-like toxin. Intake of large amount grain feed favours to propagate the bacteria on of a sudden in intestine and

stomach and produces lethal dose of toxins that produces pathogenicity.

Clinical signs

Sudden onset of clinical signs of lethargy, inappetence, abdominal colic followed by severe diarrhea with or without blood, convulsions, rapid breathing, frothing and circling, incoordination, head pressing, atony of stomach, flatulence and bleating. Animals may be found dead with no prior clinical signs. Pathological lesions are serous petechiae, fluid-filled pericardial sac, pulmonary edema, intestinal and hepatic necrosis. Diagnosis through clinical sigsn,post mortem finding, bacterial isolation and microbiological tests.

Treatment and Control

Antibiotics against *Clostridium perfingens type D* is useless onee toxins produced, mortality is very high but there is effective vaccine against enterotoxaemia. The vaccine can be given thrice in a year. Toxoid is available in market @ Raksha -ET. Before lambing/ kidding of 4-6 week to ewes, at 4 months aged lamb/kid booster after 4-5 weeks, then annual vaccination. Restriction of sole use of cocentrate feeding.

External Parasites (Lice, Ticks and Mites)

Ectoparasite of lice, ticks and mites are predominant ectoparasites in small ruminants during cool and moderate moisture condition. They are transmitted from premises, fomites and affected flocks. **Lice** cause pierceing of the skin to feed on blood, while biting lice chew on skin, hair, wool and dead tissues and debris.

Ticks of small ruminants affect ears, under tags, and in the armpit regions. Common ticks are of species *Rhipicephalus pulchellus*, *Rhipicephalus turanicus*, *Haemaphysalis intermedia*, and *Hyalomma dromedarii, Amblyomma lepidum and Amblyomma gemma*. Ticks causes various health problems like anaemia, dermatosis,alopecia,tick born blood parasites (*Babesia*, *Theileria, Tepanosoma)* and bacterial infections (*Anaplasma*, *Rickettsia*) and also causes tick paralysis.

Mites- Microscopic acarids found underneath the skin and epithelium tisssues. Mites are four type psoroptic(*Psorergates ovi, Psoroptes cuniculi)*, sarcoptic(*Sarcoptes scabiei*), chorioptic *(Chorioptes bovis var ovis)*, and demodectic(*Demodex caprae).*

Mites cause similar to lice, with intensive itching, skin irritation, and hair loss, particularly from rubbing particularly on less hairy and other parts like may be entire body, on the head, ears, neck, and trunk, particularly in heavily wooled areas.

Clinical signs of ectoparasites: Lice cause skin irritation, alopecia, pruritus, anaemia, weakness and mild dermatitis. Whereas the clinical symptoms of ticks cause wide clinical signs and diseass,they are fever,lethergy anorexia, depression,icterus, haemoglobinuria (blood

parasites). Mites causes papules, scaling, pruritus,crust formation,excoriations, alopecia, hyperkeratosis and irritation (Fig-2).

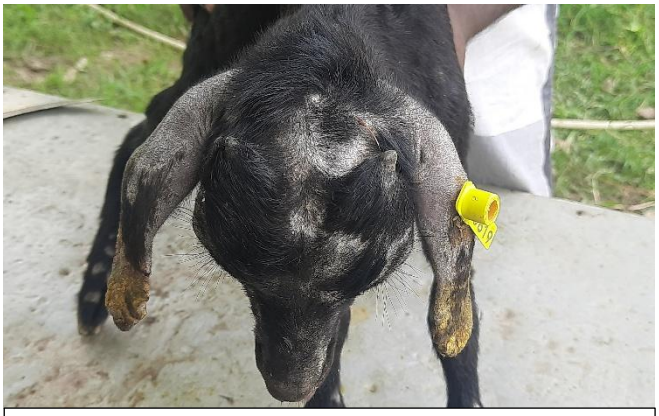

Fig-2: Mange affected head region of Goat.

Diagnosis- clinical signs, skin crust examination under microscope for mites and ticks, for haemoparasites blood examination, molecular diagnostics,

Treatment of ectoparasites- For ticks and lice dipping or tropical application of synthetic pyrethroids like permethrin, Cypermethris10% (tikkil), Organophosphate (flumethrin), Amitraz etc. For mites **macrocyclic lactones** like Ivermectin, duramectin (0.2-0.4mg/kg SC injection, repeat after 15-20days. Tropical application with Benzyl benzoate is effective acaricide (10-25%), tropical/oral medicine Isozazolines (7-15mg/kg) effective for sapcotic and demodectic mange.

Pregnancy Toxaemia (Twin lamb disease, Pregnancy ketosis)

It is a metabolic disease in small ruminants particularly in sheep and less prevalence in goats with carbohydrate and fat metabolic disorders in obese and multiparous ewes (2-3 foetus) and does particularly during winter and prewinter seasons at the last trimester of pregnancy. The condition leads to premature foetal death, abortion and maternal death. Once develops the death of ewes even with intensive healthcare and therapeutics (Ji, *et al.,*2023)

Risk factors are negative energy balance does and ewes with high energy demands for self and foetus. Thus, leads to hyperglycaemia, nutritional factors like deficiency of protein, fat and other nutrients along with physiological and environmental factors like cold, cold weather exposure, sudden rain exposure. Sheep and goats with Baroola genes responsible for multiple foetus have tendency to occurs pregnancy toxaemia.

Clinical signs are start prior to parturition (7-20 days)**,** initial anorexia particularly grain feeding animals remain recumbent, bouts occasionally, further progress of the disease leads aimless gait, listlessness, low body temperature, muscle switching and fine muscle tremors, opisthotonus, bruxism. Blindness and ataxia develop after1-2 days and finally sternal recumbency, coma and high mortaslity. Septicaemia may develop foetal autolysis

Diagnosis- Cinical signs and history gestation status, seasons, genetics predisposition. Laboratory diagnosis with high blood and urine ketone bodies (>1.6Mmol/L and low glucose level (< 28mg/DL).

Treatment has little impact if clinical signs develop, however,high dose of glucose (50%) through infusion may be tried, oral dosing of propylene glycol (glucogenic) 60ml for three days, Calcium and Potassium may be given, protamine zinc insulin (0.4 unit/kg, SC, every day) provides chance of survibility. Preventive measures are uterine ultrasonography to find twine/triplet during the first stage of pregnancy and if results positive give sufficient feed and supplement during pregnancy. Avoid physiological and environmental extreme exposure. History of genetic predisposition and care during pregnancy.

Hypoproteinaemia (bottle Jaw)

It occurs in small ruminants due to infection different parasites and chronic infections of Johne's disease in monsoon and matures during end of monsoon along with winter stresses. The disease characterized by swelling of inter mandibular subcutaneous space under the jaw, feels jelly like doughy, anaemia, inappetence and weight loss (Kumar, *et al,* 2021).

Causes are internal and external parasitism with *Haemonchos contortus,* liver flukes (Fasciola hepatica), scarcity of protein (albumen) in feed and supplements, chronic disease Johne's disease hinder absorption, liver, kidney disorders, cardiac insufficiency, lymph node/ salivary gland obstruction.

Clinical signs are swelling under jaw and mandible regions, lethargy, inappetence, anaemic signs pale gun and inner eye mucosae, reduce milk production, thin ewe syndrome, reduce intestinal absorption on villi changes.

Treatment- Paratuberculosis treatment usually dodged, anthelminthic with levamisole, fenbendazole, ivermectin can be used just after monsoon. Injectable haematinic orally or injectable (Feritus/ Imferon) 1-2ml 7 days interval for 2-3 occasions. Vitamin A, D, E, B-complex and C may be given to boost metabolism. High quality feed along with mineral and energy supplement needed.

Hypothermia and inanition

Hypothermia is physiological condition when the body temperature goes down from the average normal value. Inanition is a weakened condition caused by a lack of sufficient food materials essential to the body, this may as in starvation, inappetence or malabsorption syndrome.

Causes of hypothermia are excess heat loss and low production of heat, heat loss may be due to weather conditions, rain, hail storm, snowing, wetting, cold exposures, poor bedding, post birth uncleaning and wrapping and heat production impairment due to lack of energy reserve for new born animals, inadequate nutrition supplement and feed, poor parenteral nourishment

during gestation, certain condition in body like shock and some condition that impairs heat production and immature thermoregulatory system in new born animals. Causes of inanition are inadequate feed, transport stress, cold stress, deficiency of vitamins and minerals and anatomical aberration that hinder feeding, digestion and metabolism.

Risk factors- are neonatal animals, low birth weight and diseased condition, poor mothering and lactation status and larger litter size.

Clinical signs of hypothermia- weak appearance, inappetence and restricted gait, weak suckling and palpebral reflex (eye) and body temperature down below normal range (98-102°F). In inanition, animals cannot take feed, water and gastrointestinal tract remains empty except mucous and week physique.

Treatment and control- High dose of dextrose (50%) along with Calcium, Magnesium and Phosphorus salt, vitamin B complex, warming of the body and fedding of good quality feed and fodder

Prevention and Management of winter diseases in sheep and goats

Keep premises and farm house clean, well-ventilated to improve air quality that prevent transmission of pathogens.

Provision of balanced nutrition, to beat cold weather and stress and in late gestation to prevent conditions like enterotoxaemia and pregnancy toxaemia

Time bound deworming and parasite control program and ectoparasite treatments. Immunization program for tetanus, enterotoxaemia, and Peste des Petits Ruminants (PPR).

Diseased animal may keep in quarantine are to avoid contamination for 25-30days. Avoid dumpiness of farm house and use foot pad or foot dip at the entry of farm

Goats are much susceptible to winter stress so avoid norther cold air circulation directly into farm house, block northern side of room properly Vaccination and Nutritional deficiency management. Feed quota may be increased for pregnant and weaker animals, restriction of very succulent green fodder to avoid diarrhoea.

Conclusion

During winter months in farm and village farmers goats and sheep flocks are affected with certain diseases that harm the production, morbidity as well mortality. To overcome these diseases, need to take preventive measures prior to exposure of the seasons just after monsoon. Several vaccinations, feeding of good quality feed, roughages and supplement as well mineral and vitamins to be provided. Inclement weather must be checked to avoid winter stress etc.

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References

Kumar,A., Singh,K.K. Bhatt,S. Archana and Kumar, H.(2021).Therapeutic management of bottle jaw syndrome in cattle associated with bovine fasciolosis. The Pharma Innovation Journal 2021; SP-10(9): 722-724.

Mondal, D., Pramanik, A.K and Basak, D.K.(2004). Clinicohaematology and pathology of caprine mycoplasmal pneumonia in rainfed tropics of west Bengal, Small Ruminant Research. **51**(2004) March**:**285-295.

Spyrou V, Valiakos G. (2015)Orf virus infection in sheep or goats. Vet Microbiol. 2015 Dec 14;181(1-2):178-82. doi: 10.1016/j.vetmic.2015.08.010. Epub 2015 Aug 12. PMID: 26315771.

Ji X, Liu N, Wang Y, Ding K, Huang S, Zhang C.(2023) Pregnancy Toxemia in Ewes: A Review of Molecular Metabolic Mechanisms and Management Strategies. Metabolites. Jan 18;13(2):149. doi: 10.3390/metabo13020149. PMID: 36837768; PMCID: PMC9961611.