



Vet Tech Bulletin

Establishing Bond to Enhance Knowledge

An Inhouse bimonthly Newsletter by Cattle Remedies India Ltd. dedicated to Veterinarians

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RESPIRATORY PROBLEMS AND THEIR MANAGEMENT IN FARM ANIMALS

Respiratory problems are very common in cattle and often become a cause of economic losses since health and productivity is affected during and after the incidence of any respiratory disorder. The respiratory problems can be classified into two broad groups namely, infectious and non-infectious. Non-infectious disorders are characterized by the distress in the respiratory mechanism without the establishment of infectious agents. Nasal discharge and difficult respiration are the major signs observed. In infectious disorders some infectious agents are involved that shows a progressive migration deeper in the respiratory tract. While non-infectious disorders are treated symptomatically, it is mandatory to control the pathogens in infectious disorders. If not treated, respiratory disorders can take a serious cause and can be fatal.

ONSET OF RESPIRATORY DISORDERS

Any respiratory disorder is initiated by stress to the animal. Stressors and irritants to the respiratory tract makes the respiratory system vulnerable to infections. The major respiratory stressors include pathogens, extremes of temperature, poor hygienic conditions, transportation of animals, dust, smoke, ammonia, inhalation of chemical agents. These irritants lower the respiratory defense mechanisms thus giving a way to respiratory disorders.

RESPIRATORY DEFENSE MECHANISM AND ITS ROLE IN PREVENTION OF RESPIRATORY DISORDERS

The respiratory tract has a number of diverse yet interlocking defense mechanism that prevent damage to the respiratory system. These include mechanical defenses that filter and remove particulates from the inhaled mechanisms to capture and remove particulates that penetrate into the lung and chemical and cellular defenses that can kill invading microorganisms. These defenses may be classified into two broad categories:-

1. Non-Specific, Non-Selective mechanism that handle a variety of materials
2. Specific, immunologic responses elicited by highly selective stimulation

Optimal lung defense requires coordinated action of these various defenses. However, failure of any defense mechanism increases the risk of infection. As a result, many individuals with compromise of a single defense mechanism may not become clinically ill. Syndromes

From Editor's Desk...

Dear Doctors,

Sparkling wishes for the New Year 2009

Winter is normally presumed to be healthy season for all the species of animals as well as human beings, but one system which is commonly affected during the winter season is respiratory system. Respiratory diseases prompt a lot of visits to veterinary hospitals during winter season. Dairy owners become alarmed when a cattle has signs and symptoms such as high fever, nasal discharge, wheezing, laboured breathing and poor appetite.

The current issue of the newsletter features on the 'Respiratory Problems and Their Management in Farm Animals'. The root cause of any respiratory problem is breakdown of respiratory defense mechanism. This coupled with the presence of respiratory pathogens culminate in clinical disease. It thereby becomes imperative to strengthen the respiratory defense along with checking the progression & establishment of pathogens, if freedom from respiratory disorders is to be provided. The prophylactic use of respiratory stimulants & tonic also finds a place in prevention of respiratory disorders. The current article covers various aspects of respiratory disorders in farm animals and provides inputs on its management. We hope that the information shared will be useful in tackling the respiratory problem more effectively.

Please continue giving your feedback and suggestions for improving the quality of Vet Tech Bulletin.

Wish you a very happy reading.

Thanks,

Mukesh Agrawal
Managing Director

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characterized by chronic infection of the lower respiratory tract are therefore associated with several defects in respiratory tract defense.

Non-Specific, Non-Selective Mechanism

1. **Nasal Hairs:** Prevent entry of large airborne particles into respiratory tract.
2. **Mucus Production:** The whole of the respiratory tract above bronchioles is lined with epithelium which secretes thick sticky mucus. This not only waterproofs the inside of the respiratory tract and acts as a protective barrier against irritants but also traps bacteria and foreign particles that come in contact with it.
3. **Cilia:** These are minute hair like projections of the epithelium lining the respiratory tract that sweep the mucus towards the throat, where it is swallowed and destroyed by stomach juices.
4. **Sneezing:** It is a protective reflex stimulated when nasal mucosa is stimulated.
5. **Phagocyte activity:** There are a large number of phagocytic cells in the epithelium that engulf debris, dust and infectious micro-organisms so help to filter the incoming air.

Epithelial lining of respiratory tract is an efficient air filter. Filtration in the nasal cavity removes larger particles, slightly smaller particles are trapped as they pass through the bronchial tree and small particles are trapped in the mucus above respiratory bronchioles or in alveolar fluid where they are engulfed by macrophages.

Specific Mechanism

It includes immune cells and antibodies produced on exposure by a foreign substance (antigen). Specific immunity takes time to develop and therefore is effective in preventing infection only if the animal was previously exposed to that antigen. Exposure with antigen triggers growth and development of two types of blood cells, T-cells (responsible for cell mediated immunity) and B-cells (responsible for antibody production) which are specific for eliminating the antigen. T-cells secrete numerous hormones such as interleukins and interferons which regulate the immune system and increase the effectiveness of other immune cells including phagocytes and B- cells. In addition some T-cells directly destroy target cells.

RESPIRATORY DEFENSE MECHANISM

Viral Infection:

- ❖ Viral pathogens often infect and injure airway or alveolar epithelial cells. The resulting cytopathic changes breach the integrity of the epithelial barriers, exposing deeper tissues to inhaled pathogens, allergens or chemical toxins.
- ❖ Viral infection of epithelial cells can alter mucociliary function or the amount and rheologic characteristics of the mucus layer. Either will impair mucociliary clearance, allowing bacteria or mycoplasmal pathogens to access to the epithelial surface.

Stress:

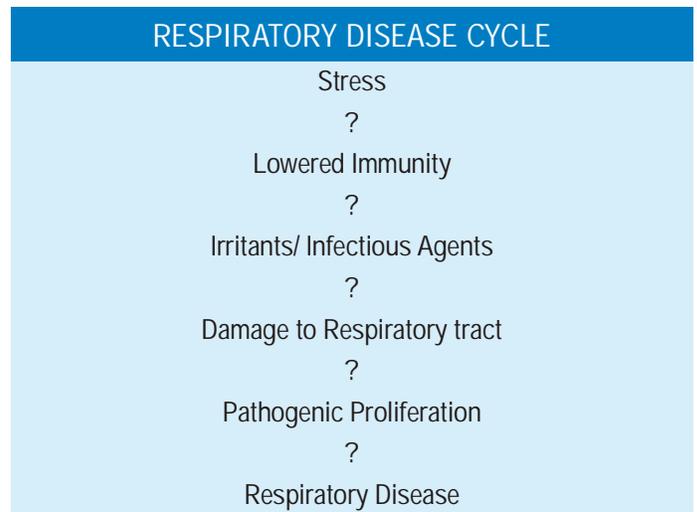
- ❖ Animals may become stressed due to transportation, weaning, handling, sudden change of temperature, high humidity in hot season, low humidity in cold season, draught, poor nutrition, and overcrowding

Chemicals and Toxins:

Ammonia from soiled bedding accumulates in many different housing situations and reduces the effectiveness of mucilliary clearance.

Physical Irritants: Dust, smoke

Animals with healthy immune system can successfully fight off the infection. However, cattle with immune suppression due to stressful factors can no longer hold pathogens in check. They enter the respiratory tract and begin to impair the protective barriers. With the loss of protective barriers, stressed cattle are more vulnerable to organisms that weaken an animals immune system. A weakened immune system allows harmful respiratory organisms to incubate and to cause respiratory malfunctions. (Ref. flow diagram 1.0 fig.)



CLINICAL SIGNS OF RESPIRATORY MALFUNCTIONS

Clinical signs of respiratory malfunctions often develop 5 to 14 days following management or environmental stresses. Signs can be variable due to the many causative agents possibly involved in the disease complex. Signs include:

- Nasal discharge that may be serous, catarrhal, purulent or haemorrhagic
- Rapid and labored breathing
- Fever (up to and over 104°F)
- Depression and weakness
- Droopy ears
- Stiff and/or staggering walking/movement
- Hanging back from the rest of the herd
- Decrease in appetite



The onset of respiratory malfunctions can be quite dramatic and rapid. The discovery of dead cattle and a high percentage of animals exhibiting depression and other signs of illness are common. The most common early signs of respiratory malfunctions are decreased appetite, depression and fever.

Early in the course of respiratory malfunctions, cattle may appear slightly depressed, including holding their head slightly lower than normal, droopy ears, and showing less interest in their surroundings than their herdmates. Respiratory involvement progresses quickly. A soft, repetitive cough is usually associated with the disease course. Watery eyes and a clear nasal discharge are often exhibited as well. Left untreated, animals can progress to heavy, labored breathing.

MANAGEMENT OF RESPIRATORY DISORDERS

Evaluate all the possible causes for stress on the cattle and determine which one can reasonably be eliminated or at least reduced so as to maintain the defense mechanism of the respiratory tract.

BUILDING RESPIRATORY DEFENSE MECHANISM

1. Housing
 - ❖ Use of filtered air positive pressure ventilation systems
 - ❖ Accommodation should be dry & dirt free
 - ❖ Avoid overcrowding, especially early in the feeding period
 - ❖ Removal of affected animals from the group
 - ❖ Continual disinfection system
 - ❖ Effective dust control
 - ❖ The provision of supplemental heat so that during cold weather the ventilation can be maintained and animals will not huddle together to keep warm.
2. Vaccination
 - ❖ Vaccination against the important viruses is a useful way of avoiding respiratory infection by improving the immunity

TREATMENT

Respiratory disease is often characterized by abnormal production of secretions and exudates and by a reduced ability to remove them. The primary goal is to reduce the volume and viscosity of the secretions and to facilitate their removal. This can be accomplished by controlling infections, modifying the secretions and when possible improving postural drainage and mechanically removing the material. Therapeutic methods include altering the inspired air and administering expectorants, anti-tussives, bronchodilators, antimicrobials, diuretics and other drugs.

Herbal Treatment of Respiratory Disorders

Herbal treatments are targeted towards improving the respiratory defense mechanisms viz. muco-ciliary functions, phagocytic activity, specific immune response.

Herbs have proven to be a safe and effective alternative for the treatment and control of respiratory disorders. Besides, herbal agent also provide relief to the animal by their anti-inflammatory, expectorant, soothing and analgesic activity.

IMPORTANT MEDICINAL HERBS FOR TREATING RESPIRATORY DISORDERS

1. *Adhatoda vasika*
Common Name : Vasa, adosa, Malabar nut
Function: Bronchodilator, powerful expectorant, mucolytic, antitussive, respiratory stimulant, antispasmodic, useful for cold, cough, coryza, pneumonia, chronic bronchitis and asthma
2. *Glycyrrhiza glabra*
Common Name: Yastimadhi, Jethimedh
Function: Expectorant, mucolytic, anti-inflammatory, analgesic, febrifuge, antitoxic, tonic, good for dry cough. It eases congestion and coughing by helping to loosen mucus in airways. It fights viruses that cause respiratory illness and an overproduction of mucus.
3. *Curcuma amada* Roxb.
Common Name: Amba haldi, Amra haridra
Function: Expectorant, anti-inflammatory, immunomodulator, febrifuge, useful in cough and bronchitis
4. *Solanum surattense*
Common Name: Kantakari
Function: Root is an expectorant, used in Ayurvedic medicine for cough, asthma and chest pain.
5. *Linum usitatissimum*
Common Name: Common flax
Function: It is alternative expectorant and analgesic. It is clinically used in cough, cold and inflammation.



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IMPORTANT EVENTS

● On October, 10th, 2008 Cattle Remedies India Limited participated in Pashu Mela held at Kathmau, Etawah (Uttarpradesh).

On this occasion, Dr. R.K Saxena, Veterinary Officer (City) and Incharge Livestock



Camp, Mr. Mahendra Singh, Deputy Director (Ag.), Mr. Bhupendra Singh, Assistant Director (Information), Dr. R.B.L Tewari, Dr. R.K Sharma and Dr. Anupam Chaudhary were present. Mr. Birender Singh Yadav, VSO-Etawah represented Cattle Remedies India Limited.

Amit Kumar Singh-ASM Patna represented Cattle Remedies India Limited.



● On November, 28th, 2008 Cattle Remedies India Limited, participated in Infertility camp which was held at Veterinary Hospital, Roesra, Samastipur (Bihar). On this occasion, Dr. Rajesh Singh, TVO-Roesra, Dr. Jagmohan Jha, DAHO-Samastipur, Dr. P. Mandal, TVO-Bibhutipur, Dr. Sambhukumar, TVO-

Shivajinagar, Dr. Prabhatkumar, TVO-Hasanpur were present and Mr.

● On 28th November, 2008 Cattle Remedies India Limited organized awareness programme for progressive dairy farmers at Jaisinghpura, Jaipur (Rajasthan). This extension meeting was on Reproductive Health Management held at Milk Collection Centre. Main aim of this meeting was creating awareness about reproductive health among dairy farmers. On this occasion Secretary Milk Collection Centre and dairy farmers were present. Dr. Pradeep Jangra-Product

Manager, Mr. Vinod Trivedi-ASM, Mr. Ramavtar Sharma-VSO represented Cattle Remedies India Limited.



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