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कुल पेज – 134

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ARTICLES IN THIS ISSUE

HYDROFARMING

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Now a days Aquaponic farming is new and uniquetrend everywhere because of increasing population lake of lands pulling towards aquaponic. Aquaponic is most appropriate where land is expensive,water is scarce,andsoil is poorand due to the increase of populationscarcity of spaces.Aquaponiccan be used in urban and periurban environments where no or very little land is available,providing ameans to grow dense crops in small balconies,indoors or rooftops.Aqua-Raising fish in a controlled environment. Ponics- growing in soil less media.Aquaponic is one of the most sustainable ways to grow food.It involves a combination of aquaponic and hydroponics in one integrated system.

We can grow vegetables and cultivatefishs utilizing aquaculture and hydroponic with eco friendly systemwhich is growing fish and otherwithout any pesticides and fertilizer.Fish and vegetables will be able to nourish each other through water circulation system.it is combination of aquaculture, which is growing fish and other aquatic animals, and in hydroponic .we can grow plants without soil.In this system uses both in a symbiotically.Inaquaponic fish and plants both in one integrated eco system.

In aquaponic two bio- integrated system

Aquaponic system

Hydroponic system

Both two system intrect with water and water cycle both of them. Fish waste in system providesto plantsnutrientsfor growth and the plants take up excess nitrogen ,providing purified water which goes back into the tank for fishes.

The basic aquaporinc system works in a wide range of conditions, and units can be designed and scaled to meet the skill and interest level of many farmers.Aquaponic is a combined system which means that both the costs and the benefits are magnified. It is beneficial for sustainable and intensive production of both fish and plantspossibly these could be higher than sperate system

Benefits of nitrogen cycle in aquaponic

Nitrogen is one of the most important nutrients in aquaponic system. Protein is built from amino acids which are themselves built from nitrogen .All plants and animals contains protein ,and when they die, other organisms consume them and scavenge these proteins for energy.Nitrogen in its N2 form has to be changed before plants use it for growth this proceeded is called nitrogen fixation.Aquaponic is possible due to beneficial nitrifyingbacteriawhich make nitrogen cycle. Plantsneed nitrogen for growth. While they are able to use both ammonia and nitrates to perform their growth processes to a certain extent, nitrates are more essential as they are easily assimilated by their roots,and are good for all types of plant.Fishexcrete waste faces urine as well as any uneaten food, quickly broken down in the form of unionized ammonia the ionized form Ammonium ,is present if the PH is blow 7 which is not toxic to fishes.Theunionized form Ammonia is present it the PH is 7 or above is highly toxic to fishes..Nitrosomonas bacteria in water convert ammonia to nitrite and nitrobacteria convert nitrite to nitrate and plants absorb the nitrate. Nutrients may already be in the form of nitrate which can be directly assimilated by the plant.If nutrients are added in other forms they can also be convert nitrate by nitrifying bacteria to nourish the plants.The ideal temperature for bacterial growth and productivity is 18-33degree Celsius ,this is temperature comfort zone for many plants and fishes.The optimum PH for nitrification is 7.5 to 9.5.and 7 is compromise point between needs of plants and fish in the aquaponic.The amount of ammonia and nitrite levels are routinely tested to check for biofilters health and proper function.

A. Aquaponic and hydroponicsystem

Aquaponic system have three living components freshwater aquatic animals fishs, plants and nitrifying bacteria and all three living components depend on each other to survive. The non living components in aquaporin are tanks, settling, basin, pumps, combined with hydroponic systeminclude buckets vertical towers, floating rafts,wicking beds nutrient film techinique.The living components are fishes ,different type of beneficial nitrifying bacteria and plants.

a. Tanks

Provide A fish tank is one of the main component of an aquaponic system and plays an essential role as they a place for fish to live .Grow beds is also important for aquaponic, fish tank and grow beds go together,and the size of one depends on the other and vice versa.The ratio of fish tank and grow bed should be 1:1means fish tank volumeshould be equal to grow bed.The type of fish and size of aquaponic system built will determine the fish tank's. Twoshape of fish tank will workround/ovaltank and square/rectangular. The round tank is suitable for aquaponic because allow the water to circulate evenly and transport solid waste into that tanks centre by centrifugal force.Round fish tank increases the fishes oxygen benefits and nitrifying bacteria in to the system and inhibit harmful bacteria.Solid wastes will not stick to the corners of the fish tank.

b. Settling

The settling tank can be made out of anything large enough to allow the water velocity to slow enough for the sedimentary solids to settle out.Usually anything that will contain 25+ minutes of flow is adequate for that.Basin is unit of catching uneaten food and detached biofilms and for settling out fine particulates Biofilter are also play important role for grow of nitrification bacteria and convert ammonia into nitrates,which are usable for plants.

c. Vertical towers

In a vertical tower grows without soil in columns above a fish tank.It is water efficient and space saving way to garden and raise fish by growing vertically and we can produce about twice the amount of plants as we can with a hydroponics system of the same area.

d. Floting rafts

Floating rafts are foam or polystyrene sheets. Planting in a raft system of aquaponic involves suspending plants with their roots hanging down in the water.Raft in aquaponic also known deep water culture(DWC)or floating system. Their mass production capability it is used as commercial aquaponic. In this system nutrients rich water circulated through the long canals usually at a depth of about 20- 25 cm,The plants are grown on the rafts boards that are supported within holes by net pots.Plants roots hang down in the nutrients rich oxygen oxygenated water,where they absorbed oxygen and nutrients to grow rapidly. The nutrients filled water flows continuously from the fish tank through the filtration process then to the rafts tank where the plants are grown, and finally back to the fish tank. Mostoften, theraaft tank is separate from the fish tank.

e. Wicking beds

Wicking beads are containers with a water reservoir at the base that acts like a giant self watering pot from the top down moisture is drawn up through the soil via a process called capillary action or wicking.Wicking beds for growing root or tuber type crops like carrots, beets,potato's.Wicking beds are water efficient watering from the bottom up prevents evaporation of surface water .No evaporation means no salting of soil, if we are watering our soil from the top with hard water ,we risk accumulating salts, because the water evaporate and leaves the minerals behind.

f. Nutrient film technique

It is use in hydroponic system .it is hydroponic techniques where in Avery shallow stream of water containing all the dissolved nutrients required for plant growth is recirculated past the bare roots of plants in a water tight channels.systemuses a pump to deliver fertilized water to grow tray and a drain pipe to recycle the unused nutrient solution. The nutrient solution is continuously flowing over the roots. This is accomplished using gravity. The grow tray is placed at an angle to allow the water to flow down towards the drainpipe, and new solution is constantly being pumped into the night end of the tube.

g. Biofilters

There are so many types of biofilterssome are rotating biological contactor expandable media filter,fluidized bed filters packed tower trickle filter.

The air pumps gets the water out of the fish tank and into the biofilter.Water goes through the nitrification process in the filter. Water robbed of unwanted chemicals but still containing nutrients is forwarded to plants.Biofilter will need protection from the sun light because bacteria are sensitive to ultraviolet light.

B. Nutrients inaquaponic

In aquaponic don't required fertilizer and supplement's for plants. In fish tank water are able to provide all required nutrients for plants. Nitrogen cycle is important in aquaponic. The availability of nitrogen in aquaponic from dead and decay animal waste and metabolic activities. That Aquaponic natural ecosystem nothing is wasted. Animal east dead and decaying plant and animals of. organic matter like residualof broken down by action of microorganism.In aerobic situation ammonia oxidizing nitrifying bacteria convert ammonia into nitrite the nitrite oxidizing bacteria convert them into nitrate compounds then plant will use.

C. Fishes and plants for aquaponic

Any type of fishes works well in aquaponic but Tilapia is the best fish to rest in aquaponic because they can adapt to their environment and withstand less than ideal water conditions.They are resistant to many pathogen ,parasites andhandling stress.Tilapia is a heardy fish and has a diverse diet.Tilapia is perhaps the most widely grown aquuabponics fish but we can also growing catfish bluegilll, trout.In selection of fishes the temperature at which they boththrive and survive.Tilapia can survive down to temperature in the low 65s,but they won't thrive until they reach the mid 70s and trout will survive up to the maximum temperature of 60,but won't thrive until their water is in high 40's to low 50's.Gold fish produce lot of waste, so ideal for this set up,Koi they grow large and have a high resale value,some ornamental fishes guppies,tetras,molliesect.,silver perch is fast growing school fish that like high den cities.In aquaponic another part is vegetables leafy green vegetables and herbs can grown successfully in aquaponic some are salad greens,tomatoes lettuce peppers cucumbersspinch mint etc.If we have heavely stocked tank and well stablished set up we can grow beans, cabbage cauliflowers, cucumbers, peas, strawberries.

Aquaponic uses less water than any other gardeningup to one tenth of the amount in traditionalsoil based gardening.Maintaining this set up isvery simple.Aquaponic uses less water than any other gardening up to. One tenth of the amount used in traditional soil based gardening and requires less time than regular fish keeping .Growing with aquaponics is completely organic.We can't use any harsh chemicals ,because they will be fatal for fish. Equaponics has other environmental benefits.There is no need for agriculture land,the negative impacts on soil are avoidedand no deforestationisrequired.Thgere is no pesticides and fertilizers runoff which would pollute tgesurrounddingsland and water ecosystem.Food can grow anywhere indoors,outdoors,in green houses,even in our bedroom,system can be adapted to our need so we shouldpromoteand incurag to our society and farmers towards aquaponic.

A CATASTROPHIC UPHEAVAL: DENGUE

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Dengue 2021 unravels like a pyrexic plight jolting the roots of the medical fraternity in India amidst the ongoing Covid-19 pandemic. DENGUE is the most frequently occuring mosquito-borne viral disease, predominantly in tropical and subtropical countries like India. It is endemic to the Indian subcontinent, thereby making India the epicentre of dengue fever. The dengue virus is endemic in 128 countries in the current scenario, posing a potential risk of different severity to billions of people annually.

Dengue is mainly an acute, self-limiting, febrile disease caused by a virus of the flavivirus genus from the Flaviviridae family, transmitted by infected Aedesaegypti mosquitoes from patients with the viral infestation or anyone with Covert infection. The disease has an incubation period of about 5-8 days, with its clinical presentation depending on the patient's age. In infants and young children, it symptomises as an undifferentiated febrile disease condition, with maculopapular rash. In contrast, the illness is a mild febrile syndrome or the classic disease in older children and adults. The strains of this virus are classified into four distinct serotypes: DV-1 to DV-4, based on antigenic characteristics. The epidemiology of dengue is witnessing remarkable changes, with larger and more frequent outbreaks reported from urban and rural areas associated with all four serotypes in India. The disease is clinically classified into mild and self-limiting dengue fever (DF) to severe dengue hemorrhagic fever (DHF) or dengue shock syndrome (DSS) which may lead to potentially fatal complexities.

Generally, the monsoon season does come with observation of smattering cases of dengue, but this year the occurrence has risen sharply. The outbreak first emerged at the dusk of the downpour season in the state with highest population in India, Uttar Pradesh. Since then, sporadic increase in cases scattered across different states and union territories of Northern plains, hills and plateau of Northern and Central India including Haryana, New Delhi, Punjab, Haryana, along with escalation in the coasts of Kerala and Tamil Nadu. GlobalData epidemiologists expect the number of diagnosed incident cases of dengue to markedly increase over the next one to two years given the severity of the dengue outbreak further aggravated by the ongoing Covid-19 pandemic. In India, GlobalData epidemiologists have prognosticated that the diagnosed incident cases of dengue are expected to show an increment close to 41,000 cases by the end of this year. The number of incident cases diagnosed to be positive for dengue viral infections is likely to surpass the current reckoned estimate as this ongoing dengue case flare-up is the worst outbreak in many years. A tremendous inadequacy of medical equipment and hospital bed availability due to the Covid-19 pandemic seen in the past year, along with the sudden increase in dengue hospitalisations is likely to create more hurdles for an already strained health system. A total of 15 states and union territories have reported their highest number of dengue cases this year, contributing to about 86% of the country's total number of dengue infections until October 31. So, keeping this in view, the health ministry has rushed high-level teams to nine states and union territories that are observing an augmentation in dengue cases, in order to help them take immediate public health measures to control the vector-borne disease and manage the situation of this recent outbreak in the country. These high-level teams consisting of experts from the national vector-borne disease control programme, the national centre for disease control, and regional offices have been deployed to Haryana, Kerala, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, Uttarakhand, New Delhi, and Jammu and Kashmir as per the directions from the union health minister, Dr.MansukhMandaviya as of November 1, 2021 during a review meeting on the dengue situation in Delhi. The teams are tasked to support the affected states to initiate an effective public health response to the surging crisis. A report on the status of vector control, the availability and use of insecticides, and the status of anti-larval and anti-adult vector control measures must be prepared. The availability of kits and medicines, detection of dengue cases at the earliest must be ensured.

The main strategy to control the spread of dengue is vector control, which aims at shrinking the size of mosquito populations by using biological means like introduction of mosquitofish in the waterbodies in and around outbreak areas. Each mosquitofish can eat up to 150 larvae in only eight hours, so, around 25,000 mosquitofish have been released into ponds and lakes in Western Uttar Pradesh. This must be supplemented by an augmented environmental management

strategy to destroy any potential breeding sites. These may be done by simple approaches for maintaining clean surroundings and hygienic domains by removal of any containers that can collect water. Launching widespread campaigns of insecticide spraying known as 'fogging', needs to be adopted in all the affected regions. Close surveillance and monitoring of the situation are critical to mitigate the outbreak and prevent further spread to the neighbouring areas. The government requires an urgent strategic response, especially in the Covid-19 pandemic, to contain the dengue outbreak. There are no specific vaccines or antiviral treatments against dengue fever. So, symptomatic treatment is generally adopted for example usage of paracetamol to bring down the fever. Aspirin and related non-steroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen should be avoided. Recovery from infection by one dengue virus provides lifelong immunity against that particular virus serotype. However, this immunity confers only partial and transient protection against subsequent infection by the other three serotypes of the virus. Evidence points to the fact that sequential infection increases the risk of developing severe dengue. The time interval between infections and the particular viral sequence of infections may also be of importance. The best way to prevent infection is to avoid being bitten by mosquitoes during daytime. Mosquitoes that commonly transmit dengue virus often live in and around the home and in the garden. People should wear clothing that covers the body well (especially legs and feet).Mosquitoes must be kept out of the house by placing insect screens over doors and windows. Application of insect repellents according to the manufacturer's label instructions, sleeping under a net, even during the day and taking extra precaution to prevent transmission if a family member is infected by avoiding mosquito bites ought to be done individually by public. Mosquitoes are the greatest mass murderers on the planet. Without any effective particular treatment or vaccine against dengue, prevention in this situation is better than cure.

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OESOPHAGEAL OBSTRUCTION OR CHOKE DUE TO ACCIDENTAL INGESTION OF SWEET CORN HEAD IN DEONI COW - A CASE REPORT

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Abstract : Six years old six months pregnant Deoni cow was admitted to Department of Veterinary Clinical complex (VCC) Veterinary collegeBidar, with the history of poor appetite, nasal discharge and regurgitation of food and water. The animal was collapsed before starting of the treatment.At thorasic oesophageal region, oesophageal lumen was fully obstructed with sweet corn head or fruit head and mucosa was congested. Based on the post-mortem and clinical findings, it was diagnosed as a case of choke at the thorasic inlet.

Key words : choke, sweet corn head, cow, post-mortem findings

Introduction

Oesophageal obstruction or choke which is considered as one of the most important disorders or diseases of cattle may be either intraluminal or extra luminal based on the type of obstruction (Haven, 1990). Objects lodged in the cervical oesophagus may be located by palpation. In cattle, it commonly occurs in the pharynx, the cranial aspect of the cervical oesophagus, the thoracic inlet, or the base of the heart (Misk et al., 2004). In cattle, clinical signs include free-gas bloat, ptyalism, nasal discharge of food and water.Female buffaloes are more susceptible for oesophageal obstruction than males (Marzok et al., 2015).

The reported causes of oesophageal obstruction in cattle and buffaloes include rexin (Shivaprakash et al., 2014), leather (Salunke et al., 2003), coconut (Madhava Rao et al., 2009), cloth (Kamble et al., 2010), palm kernel (Hari Krishna et al., 2011) and unripened mango (Mandagiri et al., 2017). Acute and complete oesophageal obstruction is an emergency because it prohibits the eructation of ruminal gases resulting in acute bloat.In cattle, severe free-gas bloat may result in asphyxia, because the expanding rumen puts pressure on the diaphragm and reduces venous return of blood to the heart. Long standing cases of formation of bloat can be life threatening if not treated in time (Prakash et al., 2014). The present case report describes, thorasic choke in Deoni cow caused by sweet corn head.

Case history and observations

A six years old with 6 month pregnant heifer (Tag No: 100168/719605) was presented for postmortem examination. Acccording to the farmer, the clinical signs and the history of the patient were poor appetite, nasal discharge and regurgitation of food and water since 3 days. It was referred to the Department Of Veterinary Clinical complex, Veterinary College Hospital, Bidar for the treatment but animal was collapsed before starting of the treatment and it was referred to department of veterinary pathology for necropsy examination.

Necropsy examination

Upon post mortem examination, at thorasic oesophageal region, oesophageal lumen was fully obstructed with sweet corn head or fruit head and mucosa was congested (fig.1 &2) On opening abdominal cavity, rumen was fully impacted with food material which was very dry in nature. Abomasal mucosa showed patchy haemorrhages and severe congestion(fig.4). There was a hepatomegaly and surface showed patchy areas of necrosis with gall bladderdistension. Splenic surface showed areas of congestion, petechial haemorrhages with infarcts (fig.5) There was haemorrhagic enteritis. Both the kidneys were congested. Heart was congestedand lumen showed current jelly clot (fig.6). Tracheal mucosa was congested and both the lungs were emphysematous with areas of consolidation in cardiac lobe and some patchy consolidated areas in diaphragmatic lobes too (fig.7).

Bovines are frequently affected by esophageal obstruction than other animals and this is attributable to their greedy nature and peculiar indiscriminate feeding habits (Smith, 2008).The prognosis is good for animals suffering from oesophageal obstruction if they are treated within 24 to 36 hrs from the onset of clinical signs, but it worsens for those animals that are not identified within 36 to 48 hrs. This is attributable to secondary ruminal tympany as well as to inflammation

and necrosis of the oesophageal mucosa (Ravikumar et al., 2003).

In present case, ruminal impaction and superficial congestion of the oesophageal mucosa developed as the case had suffered for more than 2 days and finally, the death of the animal was due to asphyxiation exerted by the oesophageal obstruction on trachea.

Conclusion

Based on clinical findings and post-mortem findings, the case was successfully diagnosed as choke or oesophageal obstruction at thorasic inlet in cow caused by sweet corn obstruction.

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Fig.1.

congestion of the oesophageal lumen.

Fig.2.

Oesophageal lumen was fully obstructed with sweet corn head or fruit head

Abomasal mucosa showed severe congestion and haemorrhages

splenic surface showed areas of congestion, petechial haemorrhages with infarcts

Heart lumen was showed current jelly clot.

lungs showed emphysematous and consolidation.

BACKYARD POULTRY FARMING

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Introduction

Backyard poultry farming is common among rural and landless families in India and it is a source of income. It involves low investment and yields high economic returns, and can be easily managed by women, children and the elderly. Meat and eggs from such birds are inexpensive and rich source of protein and energy for poor households.

Backyard poultry farming is characterized by an indigenous night shelter system, scavenging, natural hatching of chicks, lowproductivity of birds, scant supplementary feed, local marketing and minimal health care practices.

The organized or commercial poultry sector in India contributes 70 to 75% of the total meat and egg output while the unorganized sector contributes 25%. According to the 20th Livestock Census reports of the Government of India, total poultry population is 851.81 million (including backyard poultry population of 317.07 million), which is a 45.8% rise over previous livestock censuses.

Advantage -

1. A source of employment to small and marginal farmers.
2. Enhances soil fertility (15 chickens produce 1-1.2 kg of manure/day)
3. Egg and meat with low investment
4. Helps to control ecto-parasites in domestic animals
5. Eggs and meat contain low levels of cholesterol and saturated fats and high levels of vitamin compared to meat from commercial poultry
6. Source of nutrition for families

Profitcompare the commercial poultry

1. Housing for backyard poultry can be made with local resources and hence inexpensive
2. Backyard birds scavenge or can thrive on leftover cereals, requiring no supplements and hence inexpensive
3. Backyard poultry need negligible veterinary inputs, with the exception of vaccination for New Castle Disease. Commercial poultry requires viral, bacterial and parasitic control.
4. Commercial poultry needs clean water supply while backyard poultry can thrive on local sources

Some Limitations inbackyard poultry

- ❖ Slow growth
- ❖ Low body weight
- ❖ Late sexual maturity
- ❖ Low egg production
- ❖ Prolonged broodiness

Improved backyard poultry

Given some of the limitations of indigenous backyard poultry breeds, research organizations and private institutions have developed improved varieties of birds for meat, eggs or dual purpose. Improved varieties lay more eggs, gain greater body weight, have attractive plumage, involve low input costs, have high disease resistance, abetter survival

rate and lay large brown eggs resemblingdesieggs. However, desihens can be used for brooding eggs of improved bird varieties.

The improved layer varieties have the potential toproduce 140-170 eggs in a laying year under free rangeconditions and 160-200 eggs under organized farmconditions. The birds weigh on average 2.5-3.5 kg inmales and 1.5-2.0 kg in females. A few improved eggpurpose varieties developed in India are discussed.

Management of improved varieties of backyard poultry

Backyard poultry can be reared for egg production insmall numbers (10-20) under free range conditions if optimum natural feed resources are available.

However, if the local demand is for meat, birds canbe reared in larger numbers under intensive/semi-intensiveconditions by providing inputs similar tothose given to commercial broilers. Consequently, theyneed to be reared under proper brooding/nurserymanagement up to six weeks, after which they may bereleased under a free range or scavenging system.

Brooding management

- Brooding care of chicks ensures constant body temperature and protection from predators.
- The brooder house ?oor must have a uniform 1-2 inch spread of clean liter like sawdust, paddy husk,rice husk, coconut husk, etc.
- Litter absorbs moisture from poultry droppings and provides warmth in winter and coolness in summer.
- Rake the litre frequently and treat it with slaked lime to avoid caking. Remove moist liter and replace it with fresh litter.
- Spread newspapers on the litter to prevent chicks from feeding on it tll they are accustomed to di?erentate litter from feed.
- Rear the chicks on standard chick starter ration.
- Brooding can be natural or artificial; the former involves a broody hen and the later may involve heat sources, reaectors, electric bulbs,etc.

Managing adult birds

- Let the birds free to forage/scavenge during the day; provide them shelter during night.
- Provide clean drinking water before letting them out.
- The preferred ?ock size is 12-15 birds per household depending on the area and natural food available.
- Extra roosters can be reared separately and marketed for meat.
- Night shelters should be well ventilated, have adequate light and protection from predators.

Feed management

- Should be reared on standard chick starter ration during the initial six weeks under nursery rearing or brooding.
- In the second growing stage, besides the feed material available in free range, provide naturalfood or greens like waste grains, germinated seeds, mulberry leaves, azolla, drumstick leaves and subabul leaves (high protein sources).
- Extra feed will depend on the free range available, intensity of vegetation, availability of waste grains, insects, etc.
- Under free range conditions, the birds meet their protein requirements through scavenging, but the risk of energy deficiency is common. Feeding with locally available cereals like maize, sorghum, pearl millet, broken rice with equal parts of polished rice or rice bran is essential. However, the nutrient intake of scavenging birds varies with place and season, crops grown and the natural vegetation available.
- Restrict feed at six months of age (age of sexual maturity in layers) to control the weight of the birds.
- During the rainy season and harvest time, worms,insects and post-harvest leftovers will be plenty forth birds to feed on.

- During the dry season of scarcity, feed supplements, including household waste (kitchen leftovers) and oilseed cakes have a positive e?ect on egg production and body weight of scavenging birds.
- A handful of grains or kitchen waste in the morning and evening can be given to supplement scavenging.
- The scavenging feed base is very important for propagation of backyard birds. Soil type and cropping systems dominated by wheat, maize, rice, sugarcane and finger millet make up supplementary feed base.
- Supplemental calcium sources like limestone powder, stone grit and shell grit at 4-5 gm per bird daily, especially during the laying phase, leads to a high rate of survival and good egg production.
- Any feed of grain or household scrap should be given inside the shelter. When regularly provided inthe evening, it will help train the birds to willinglyenter the enclosure before nightfall.

Breeding management

- A rooster can service six to eight hens to obtain fertile eggs.
- Collect fertile eggs from the nest regularly and store them in a cool and well-ventilated place.
- Place 10-12 eggs under a brooding hen within two weeks of egg collection for higher hatchability.
- Rural hatcheries can be set up using a community based approach for improved hatchability under field conditions.

Health care

- Vaccinatebirds against Marek's disease, Newcastle disease (Ranikhet disease), fowl pox, etc. For greater immunity.
- Deworm birds regularly to protect from internal parasites due to their scavenging nature.
- While debeaking is discouraged in rural poultrygiven that the birds need to forage and scavenge,it is recommended if the farmer is rearing about 80-100 or more birds to avoid cannibalism, egg biting, feather pecking, etc.
- After the first deworming, repeat at three-weekintervals for a total of four deworming sessions.
- While medicating via drinking water, follow theveterinarian's advice on the amount of medicineto be mixed in the water that chicks normallyconsume in four hours.
- Provide extra water only when all the medicatedwater is consumed.
- Dust and dip the birds or fumigate the house at theslightest indication of external/ecto-parasites.
- Take care not to dip the head and avoid dipping onrainy days.
- Strictly follow the instructions of veterinarians andmanufacturers to avoid health hazards.
- Avoid rearing deferent species of poultry together (chicken with ducks, turkeys etc.). Separate young and adult stock.
- Maintain hygiene in poultry houses and keep equipment clean. Ensure proper disposal of dead birds. Prevent entry of rodents. Though bio security is cost intensive, it pays in the long run in terms of fewer losses from infection and good quality production. Periodical culling is advised to control the spread of diseases.

Marketing of Backyard Poultry

While products of backyard poultry are in great demand in India,they require the right market. Community-based approaches like Self Help Groups (SHG), Farmer Producer Organizations and poultry cooperatives can provide the right platform to market the birds without the involvementof middlemen. Encouragemarketing on the basis ofnet weight instead of Rockselling.

IMPORTANCE OF FEEDING BY- PASS NUTRIENTS IN RUMINANTS

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The most essential criteria in determining dairy animal profitability are milk output and optimal reproductive performance. To satisfy the increased milk production, high-yielding cows require more nutrients. However, in early lactating cows and buffaloes, energy intake does not match the need for increased milk production, resulting in the establishment of a Negative Energy Balance (NEB) that has a direct impact on their performance. As a result, the extent and duration of NEB must be reduced in order to increase the productive output of animals. One such strategy is the use of bypass nutrients, which protect dietary elements (fat, protein, etc.) from hydrolysis, allowing them to skip the rumen fermentation and be digested and absorbed from the lower tract. Protected starch, chelated minerals, and vitamins are among the additional nutrients that are protected.

Benefits of feeding bypass nutrients . Increased nutrient consumption efficiency. . Increased availability of essential amino acids . Increase in fat and SNF per cent, as well as improved milk output. . Improved growth in young animals. . An increase in the efficiency of reproduction. Various Bypass Nutrients . Bypass Proteins . Bypass Starch . Bypass Fats . Bypass/ Chelated Minerals . Bypass Proteins Dairy Bypass Protein is a type of animal or plant-based protein that resists breakdown in the rumen of dairy cows, allowing it to transit into the lower gastrointestinal tract and feed the cow with vital amino acids. For ruminant animals, the majority of the feed is degradable in the rumen, 'Rumen Degradable Protein' (RDP), while a variable proportion of dietary protein escapes rumen decomposition, 'Un-degradable Dietary Protein' (UDP). Following enzymatic digestion, UDP reaches the lower tract and is primarily absorbed as amino acids. The rumen microorganisms use the

majority of the RDP fraction as a source of nitrogen for protein synthesis, while the rest is absorbed as ammonia. Because microbial protein alone cannot meet the protein requirements of rapidly growing animals, proteins in the form of UDP, escape proteins, or protected proteins must be provided to meet the demand. The protection of protein can be achieved by various methods. 1. Naturally Protected Proteins: viz., maize gluten meal, cottonseed cake, fish meal, coconut cake and maize grain, etc. 2. Heat Treatment: Heating a protein supplement thoroughly promotes denaturation of the protein, which protects it against microbial fermentation in the rumen. Heat treatment at 125-150•‹C for 2-4 hours could effectively protect proteins. 3. Esophageal Groove: This is a normal function in young ruminants. It is good for liquid proteins. Salts of sodium, copper, silver, and zinc are often utilised chemicals that influence the closure of the groove. 4. Formaldehyde Treatment: This is the most common chemical treatment for protein protection. The use of formaldehyde to protect ruminant dietary protein is based on the idea that bonded formaldehyde affects the solubility of the protein at pH 6.0, making it resistant to microbial attack in the rumen without affecting its digestibility in the small intestine. 5. Post Rumen Infusion (Fistula): A surgically placed fistula in the lower intestine is a simple way to avoid rumen microbial protein breakdown. 6. Protein Encapsulation: Protein encapsulation is commonly used for high-value proteins. Proteins can be supplied in capsule form with a combination of lipids or fatty acids, as well as carbonate, kaolin, lecithin, glucose, and other additives. 7. Analogs of Amino Acids: Another strategy for rumen bypass of amino acids is structural modification of amino acids to promote resistance to ruminal breakdown. The analogue must be biologically potent in tissue metabolism in addition to being absorbable from the small intestine. Methionine hydroxy, N-acetyl-DLMetionine, DLHomocysteine and other analogues have provided satisfactory results. 8. Reducing Rumen Retention Time: Less time in the rumen environment means less breakdown since feed or protein is exposed to enzymatic action for lesser duration. The explanation is a faster feed transit through the rumen. . Bypass starch By pass starch can help to minimise lactic acid production in the rumen, which would otherwise prevent fibre digestion due to the rumen's acidic pH. Thus, starch which escapes rumen fermentation, is digested in the small intestines producing glucose, which after absorption is more efficiently used as energy source by the animals, compared to lactic/propionic acid absorbed from rumen.

Starch protection techniques include: Formaldehyde treatment can protect starch from degradation. Another way for protecting starch against ruminal hydrolysis could be to treat it with ammonia. It has been shown that treating starch with sodium carbonate and sodium hexameta phosphate reduces starch decomposition.. Bypass fat Rumen bypass or "protected" fats are dry fats that have been treated to make them easier to handle and incorporate into all animal meals. At rumen body temperature, dried lipids are mainly insoluble due to their high melting temperatures. Through a combination of caloric and non-caloric effects, adding protected fat to dairy feeds can improve dairy cow efficiency. Caloric effects are due to lipids' higher energy content and energetic efficiency as compared to carbohydrates and proteins, with the overall benefit of increased milk supply and lactation persistence. The non-caloric effects include improved reproductive performance and altered fatty acid profile of milk. Methods of fat protection: Lipids encapsulated in formaldehyde-treated protein provide effective protection against ruminal hydrolysis and bio-hydrogenation of lipids, although the approach has limitations due to the use of formaldehyde. Free fatty acids are removed from edible oils during refining by treating them with sodium hydroxide and then acid. The free fatty acids thus removed by centrifugation are termed as acid oil which has roughly one-third the price of edible oils. These acid oils can be converted into calcium salts either by fusion or participation method. As a result, fatty acids in the form of calcium salts are protected against rumen enzymes, a strategy that can be exploited commercially for lipid protection. CONCLUSION In general, providing bypass nutrients to fast-growing calves and high-yielding dairy cows may be useful because they have a higher nutrient need. The animal response may be, however, quite variable due to other limiting factors (nutrients, health, management) affecting the utilisation of nutrients. The beneficial response to bypass nutrients feeding at lower output levels could be attributed in part to the energy supply provided by these diets. This is especially true when bypass nutrients-containing supplements are used with low-quality fibrous meals like straws. Hence, feeding of by pass nutrients can help in increasing the efficiency of high yielding animals and can assist in boosting daily net revenue.

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DIVA STRATEGY IN FOOT-AND-MOUTH DISEASE SERO-SURVEILLANCE WITH SPECIAL REFERENCE TO HARYANA

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In India, foot-and-mouth disease (FMD) is one of the most important viral diseases of domestic animals affecting large ruminants mainly cattle, buffalo, pigs, sheep, goat or wildlife population. FMD is considered to be a major threat to animal health, dairy sector and livestock economyleading to financial losses to farmers as there is lesser milk production and reduction in working capacity of affected animals. Also, farmers bear with the burden of economic hardship due to increased expenditures on medication, quarantine, isolation, shelter, etc. The affected animal shows symptoms of high fever, blister like vesicles in mouth, teats and inter-digital space of foot, excessive salivation with reduced feed intake and drop in milk production. Pigs show presence of vesicles on the snout and lameness as characteristic sign of FMD infection.

FMD is caused by FMD virus (FMDV) having RNA as genetic material, classified in the Genus Aphthovirus within the Family Picornaviridae. FMD is highly contagious and transmitted by respiratory route through aerosols and close contact. The disease is characterised by high morbidity which may reach upto 100% in susceptible livestock population with lesser mortality in adults while high mortality is reported in young calves due to necrotic myocarditis.Owing to safeguard the animal health and economy of our country, Government of India has initiated the FMD Control Programme (FMD-CP) since 2003-2004 under the 10th Five Year Plan in 54 districts of India later covering the whole country. Now the National Animal Disease Control Programme (NADCP) has been initiated by the Govt. of India to control FMD with vaccination since 2019. The major component of these control programmes included mass vaccination of all cattle and buffaloes at six monthly intervalsagainst FMDV, public awareness campaigns and sero-monitoring of disease.

In country like India where control of FMD through slaughter policy is not possible, control by vaccination in the only practically adopted measure. However, vaccination raises the critical issue of differentiation of infected from vaccinated animals (DIVA). Hence, active surveillance of the disease on random basis is required for effective control. Vaccination with inactivated vaccines (devoid of non-structural proteins, NSP of FMDV) elicits antibody response against the structural proteins of the virus similar to the infection.The sero-monitoring of disease i.e., pre- and post-vaccination antibody monitoring is being done in the country by a very sensitive technique called solid phase competitive enzyme linked immunosorbent assay (SPC-ELISA) developed by Scientists of ICAR-Directorate of FMD (ICAR-DFMD). This test detects the antibodies against the structural proteins of FMDV. Apart from development of antibodies to structural proteins of FMDV, the antibodies against NSPs of FMDV are also inducedduring natural infection but not after NSP free FMDV vaccination. As per the OIE guidelines sero-surveillance should be performed by an assay capable of differentiating infected from vaccinated animals (DIVA strategy) in the regions which are adopting vaccination to control FMD. Thus, the differentiation between the FMDV infected and vaccinated animalsis being done in the labs using NSP based ELISA (3AB3 NSP-ELISA) developed by Scientists of ICAR-DFMD.

The best tool for sero-surveillance of viruscirculation is identification of antibodies against NSPsof FMDV in the serum sample of cattle/ buffalo/ sheep/ goat/ pigs which are considered to be good indicators of FMDV infection for discrimination of infected animals from vaccinated ones.Several recombinant NSPs based ELISA for FMDV diagnosis namely 2B, 2C, 3A, 3AB, 3B, 3ABC and 3D are available for use in DIVA. Of these, 2C, 3A, 3ABC or its derivatives such as 3AB3 based NSP-ELISA tests are more promising. In India, DIVA ELISAs have been developed employing 3AB3, 3ABC, truncated 2C (2Ct)NSPs and the assays have been validated for field application. Of these, the 3AB3 NSP-ELISA is being used countrywide for sero-surveillance. The NSP-ELISA as developed and standardized using Escherichia coli expressed recombinant r3AB3 antigen by the ICAR-DFMD, Mukteswar, Uttarakhand is being used for screening of serum samplesof animals. r3AB3 NSP-ELISA particularly, have emerged to be the most reliable indicator and appear to produce conclusive evidence of previous infection, whether or not the animals have been vaccinated. It has been demonstrated that the antibody response against 3AB3 could be used as a reliable serological marker for DIVA.

DIVA test is normally recommended to be conducted in young animals of age group 6-12 months as adults being multiple vaccinated with anti-FMDV vaccines may result in development of antibodies against NSPs also, resulting in

false positive DIVA test. As reported by ICAR-DFMD in its Annual Report 2019, in India, 30,413 bovine serum samples collected at random from various parts of the country were tested using r3AB3 NSP-ELISA (DIVA) for assessing the prevalence of NSP-antibody (NSP-Ab) positive animals, which is an indicator of FMD virus exposure regardless of vaccination status and virus circulation. The test revealed overall seropositivity in 20.8% animals, which is slightly higher than the previous year's average of 19.98%.Thesero-surveillance against FMD is being carried out by 27 Regional and Collaborating Centresacross the countryand ICAR-International Centre for FMD (ICAR-ICFMD) at Bhubaneswar.

The FMDV circulation was monitored in cattle and buffaloes of Haryana by the testing the serum samples collected by field Veterinarians/ para staff of Department of Animal Husbandry & Dairying, Govt. of Haryana. The samples were tested by the Scientists of Regional Research Centre on FMD, Department of Veterinary Microbiology, LUVAS, Hisar for detecting the antibodies against 3AB3NSPs of FMDV. A decreasing trend has been observed in the DIVA reactivity of animals of Haryana i.e.,8.1%, 7.1%and 4.4% during 2018-19, 2019-20 and 2020, respectively. This DIVA data (virus circulation) has a direct correlation with reduction in FMD outbreaks (Nil) and higher percentage of animals having protective antibody titres (SPC-ELISA), thus indicating that the FMDV activity in Haryana has decreased after FMD+HS combined vaccination since 2019. Thus, it is of utmost importance that the inactivated FMDV vaccines being used underNADCP throughout the country are certified as "NSP Free" by the manufacturers for successful adoption of NSP-ELISA based DIVA strategy for FMD sero-surveillance which in turn aids in the assessment of effectiveness of vaccination based FMD control programme.

Several nations have gained FMD-free status through stamping out policy and/ or systematic mass vaccination programme and enjoy economic benefits from international trade in animals and livestock products. As control of FMD through eradication by slaughter policy is not practicable in our country due to ethical and socio-economic reasons, therefore, the only way out to control FMD is by routine vaccination to achieve protective antibody response against FMD.Use of DIVA strategy is crucial in identifying the potential disease free zones (DFZs) with vaccination in the country. It is expected that with the successful implementation of NADCP (earlier FMD-CP) across the whole country, India will be having DFZs with vaccination in phased manner followed by FMD free country.

SHEEP ASSOCIATED MALIGNANT CATARRHAL FEVER IN CATTLE

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Introduction

Malignant catarrhal fever (MCF) is a fatal lymphoproliferative disease of cattle and other ungulates caused by the ruminant Gamma-herpesviruses, Alcelaphine herpesvirus-1 (AlHV-1) and Ovine herpesvirus- 2 (OvHV-2). Two endemic forms of MCF with distinct geographical distribution exist worldwide. Alcelaphine herpesvirus-1 (AlHV-1) naturally infects wildebeest and causes wildebeest associated MCF (WA-MCF) in cattle in regions of African sub-continent. The Ovine herpesvirus-2 (OvHV-2) infects all varieties of domestic sheep as a sub-clinical infection and causes sheep associated MCF in susceptible ruminants in most regions of the world. These viruses cause inapparent infection in their reservoir hosts (wild-beest for AlHV-1 and sheep and goat for OvHV-2) but fatal lymphoproliferative disease when they infect MCF-susceptible hosts (Bison for AIHV-1 and cattle, water buffalo, bateng, antelopes and pigs for OvHV-2).

Sheep associated malignant catarrhal fever is an emerging important disease and it is particularly significant in the Indian context where mixed farming is common practice. In India, there is mixed livestock farming system of cattle with sheep and goats which leads to increased chances of close contact of carrier animals with clinically susceptible animals. In India, the detection of cases of SA-MCF in cattle and OvHV-2 infection in sheep during the last decade has established the presence of the virus in native sheep of the country. This disease is on the list of notifiable disease to the World Organization for Animal Health (OIE). Due to recent clinical cases of sheep associated malignant catarrhal fever in cattle in India and subsequent detection of OvHV-2 in these animals, this virus has caught attention in India also.

Etiology

The disease is caused by Ovine herpes virus-2 (OvHV-2) which is enzootic worldwide in domestic sheep and transmitted to a wide variety of domestic and wild ruminants, including pigs. This virus is belonging to family- Herpesviridae, subfamily - Gammaherpesvirinae and genus-Macavirus.

Host range

Sheep are the original host but the infection may naturally be transmitted to cattle, bison, deer and pigs. Goats can also act as a source of infection for cattle. There is a wide spectrum of species-susceptibility to OvHV-2-induced disease, ranging from relatively resistant cattle species and cases are usually sporadic, to much more susceptible deer species, bison and water buffalo to extremely susceptible Bali cattle and deer.

Transmission

The OvHV-2 is transmitted by contact or aerosol, mainly from less than a year old lambs. Lambs are infected usually at 3-6 months of age by aerosol transmission from other individuals within the flock and begin to actively shed virus at 6-9 months of age. Shedding decreases at 10 months with adults shedding at a much lower rate than adolescents. Adult sheep can be infected by OvHV-2 via horizontal transmission through natural contact and it may intermittently shed large quantities of virus from nasal secretions.

Clinically susceptible species acquire the virus through inhalation, although ingestion of virus-laden secretions from contaminated feed or water. Colostrum and milk samples from infected ewes are strongly positive for OvHV-2 DNA, which suggests that mammary secretions could serve as an important source of infection for newborn lambs. Semen of rams and suggested an important role for sexual transmission of this disease.

Incidences and Epidemiology in India

Overall prevalence of OvHV-2 infection in the cattle in the Kashmir region was estimated to be less than 1 per cent. Captive female bison died within three days of development of clinical symptoms from Bannerghatta National Park, Bangalore. Investigated outbreak of sheep associated malignant catarrhal fever in crossbred cattle in a village of Andhra Pradesh has been reported between December and January 2013-14. Also it has been reported that the prevalence of OvHV-2 infection in sheep population of Karnataka was 24.44 %.

Pathogenesis

The pathogenesis of MCF consists of three components:

- T-lymphocyte hyperplasia in lymphoid organs and accumulation of these cells in non-lymphoid tissues
- Epithelial degeneration/necrosis and hyperkeratosis
- Vasculitis

Clinical signs

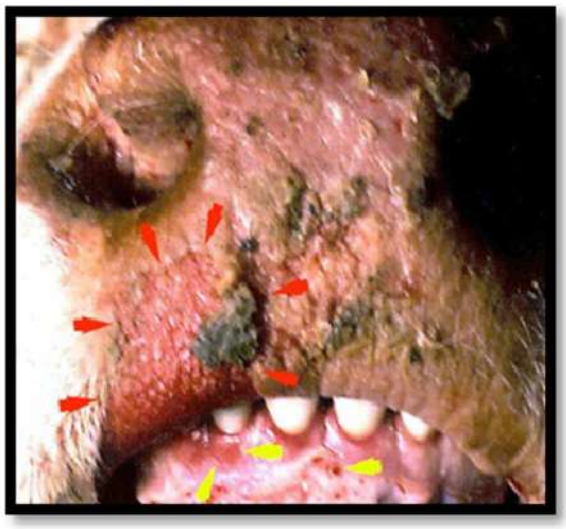
Incubation period of the disease ranges from 11-73 days. Clinical signs of MCF in cattle are presented in distinct forms of clinical disease: peracute form, head and eye form, alimentary form, neurological form and cutaneous form.

Per-acute form

This form lasts for 1-3 days. There is usually high fever, dyspnoea and an acute gastroenteritis.

Head and eye form

Typical signs of head and eye form are opacity of the cornea, with a narrow grey ring at the corneo-scleral junction shown in fig. 1, 2 and 3. The characteristics of this form include high fever (40-41 □C), mucopurulent nasal discharge, dyspnea due to nasal cavity obstruction, lymphadenopathy and blepharospasm. The muzzle and nares are usually encrusted and the superficial lymph nodes are often markedly enlarged in cattle.



The alimentary form

The alimentary form has several of typical symptoms of head and eye form except that there are only minor eye changes and pronounced diarrhea. The oral mucosa is often hyperemic and may contain multifocal or diffuse areas of necrosis shown in fig. 4. Erosions may be found at the tips of the buccal papillae.

Neurological form

Early stages of neurological form involve nervous signs with weakness in one leg, in-coordination, muscle tremor and demented appearance. The final stage of this form includes head pressing, nystagmus and paralysis which are are typical signs.

Cutaneous form

In this form skin is erythematous or ulcerated and hardened; scabs may develop particularly on the perineum, udder and teats shown in fig. 5 and 6. Horn and hoof coverings may be loosened or sloughed. The joints may be swollen and milk production often drops.

Post mortem lesions

Gross findings at post-mortem examination include petechial haemorrhages on the tongue, buccal mucosa, in the gastrointestinal and respiratory tracts and urinary bladder. Commonly, there are raised pale foci on the surfaces of the kidneys and these may extend into the cortex. There is general enlargement of lymph nodes.

Diagnosis

Diagnosis of SA-MCF poses significant challenges to veterinarians due to multi-systemic involvement of the disease and symptomatic resemblance to many other diseases in the field and its complex pathogenesis. A complete history of the affected animal along with clinical symptoms and its contact with carrier species, grazing habits, calving, type of rearing etc. are important to arrive to a tentative diagnosis. However, confirmatory diagnosis is based on laboratory tests.

Histopathological examination

Samples will be obtained from the lungs, heart muscle with carotid artery, brain (cerebrum, cerebellum, midbrain), lymph nodes, tonsil, liver, kidneys, adrenal glands, ureter, tongue, bile duct, bronchial wall, blood vessels and eye (cornea, lens, choroid).

Histopathological examination demonstrated fibrinous oedema and necrosis in the lymph nodes, vasculitis in blood vessels of the brain and kidney. Mononuclear infiltration in the adrenal glands, necrotic liver and chronic cholangitis and infiltration of the lymphocytes in the portal areas.

Serological test

Antibody of OvHV-2 can be detected by using AIHV-1 as the source of antigen. Domestic sheep consistently have antibody that can be detected by immunofluorescence, ELISA or immunoblotting. Complement fixation test and competitive inhibition enzyme linked immunosorbent assay can also be used.

Differential diagnosis

The clinical differential diagnosis of MCF should include bovine viral diarrhea/mucosal disease, foot and mouth disease, blue tongue, rinderpest and infectious bovine rhinotracheitis but the stated diseases do not show ocular (kerato-conjunctivitis), enlargement of lymph nodes and signs of encephalitis

Treatment

The recent availability of derivatives of acyclovir compounds that inhibit replication of herpesviruses shows promise in potential treatment regimens. In order to prevent secondary bacterial infection drugs like oxytetracycline and sulphadimidin, procaine penicillin,ceftiofur sodium can be administered through parenteral route. Supportive treatment with flunixin meglumine and vitamin A has been suggested. Corticosteroid may be used as a life saver.

Prevention and control

There are no vaccines available till date. In India a mixed livestock farming system of cattle with sheep and goats, is most common which leads to increased chances of close contact of carrier animals (sheep and goat) with clinically susceptible animal such as cattle and buffaloes while housing or grazing. Certain points to keep in mind for control of the disease are enlisted below:

- ❖ Segregation of the susceptible host from the reservoir hosts is most important step for control of the disease.
- ❖ If cattle and sheep are reared under natural flock conditions, the grazing areas should be separate.
- ❖ A program to produce sheep free of infection should be initiated in which lambs are removed from contact with infected sheep prior to 2 months of age.
- ❖ Zoological parks should only introduce only sero-negative animals.
- ❖ The distance of separation between sheep and susceptible species should be as great as possible that should be at least 1000 meters if not further.

Conclusion

With spread to a large part of the world, MCF has become one of the emerging diseases of ruminants. Due to its sporadic nature and overlapping clinical signs it produces, the disease is now receiving due attention in our country. With development of PCR based assays and their improved versions, it has now become easier to know the status of this disease. Currently, there is no policy in place related to the control of MCF. However segregation of the susceptible host from the reservoir hosts is most important step for control of the disease. A program to produce sheep free of infection should be initiated. Zoological parks should introduce only sero-negative animals.

MANAGEMENTAL INTERVENTIONS TO REDUCE WEANING STRESS IN PIGLETS

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Introduction : Weaning can be defined as the separation of the young one from the mother.Weaning is a traumatic time for young piglets. Weaning a piglet from a sow is one of the most stressful moments in a piglet's life, and it can cause digestive and immune system dysfunctions, resulting in decreased pig health, growth, and feed intake, especially in the first week after weaning.Stress is a biological response from internal or external events, real or perceived, that disrupts an animal's homeostasis. Some of the negative consequences of weaning stress have been mitigated by technological advancements in housing, nutrition, health, and management, but a better understanding of the biological impacts of stress is required to improve weaning stress techniques. Good management practices at the time of weaning can reduce the detrimental effect of various stressors on the piglets. Therefore better herd can be achieved with minimum stress.

Problems associated with weaning in pig: Weaning is a stressful event causing to various problem such as

1. Depressed growth rate
2. Piglet diarrhea or scouring
3. Poor defecation habits
4. Poor social interaction
5. Suppress the secretion of hormone
6. Lack of protective immunity
7. Development of stressful behaviors e.g. cannibalism.

Management interventions

To mitigate the negative effects of weaning stress on piglets, we must followseveral management strategies in order to improve herd performance.

A. Feeding : It is one of the important aspect to minimize the post-weaning stress and increase viability in piglets.

1. **Creep feeding :** Provision of creep feeding to piglets is the key to increasing the rate of survivability and minimizing the weaning effect in piglets. Creep feeding refers to the technique of providing a solid diet to piglets while they are still nursing from their mother, in order to prepare their digestive systems for weaning. Creep feeding starts and encourages the development of gut and digestive enzymes, allowing the piglet to assimilate nutrients from sources other than milk. As the age of weaning approaches, creep feeding becomes more crucial and advantageous.
2. **Inclusion of L-glutamine :** Glutamine is an essential amino acid that helps the body perform a range of functions. It is a protein-building block and an important component of the immune system. At the time of weaning, there is a drastic decline in the level of glutamine in the body. The addition of glutamine in the diet of wean-piglets improves intestinal function and overall performance (Zou et al., 2006). Glutamine in diet also reduces the chances of diarrhoea in piglets commonly known as pig scours. So the inclusion of glutamine could also prevent the effect of weaning stress by preventing piglet diarrhea which is the major cause of piglet mortality.
3. **Addition of nucleotide :** Nucleotides are semi-essential micronutrients for tissues with a high rate of cell replication. It has also been demonstrated that an improved supply of nucleotides via the diet improves the repair of damaged DNA in the immune cells of pigs (Salobir et al., 2005). Martinez et al. (2007) found that adding nucleotides to weaned pigs' meals reducesdiarrhoea scores by 12 percent. Supplementation of pig diets with nucleotides has been demonstrated to reduce diarrhea and thus improve growth performance.
4. **Probiotics :** The World Health Organization (WHO) defines probiotics as live microorganisms that when administered in adequate amounts, confer a health benefit on the host. When weaning is practiced there is a

drastic decline of essential microorganisms in the gut of the piglet. And there is an increased number of harmful bacteria like E.coli and Streptococcus spp bacteria in the gut which affects the entire intestinal function. So the addition of probiotics in the diet helps in better digestion and thus increases growth rate and FCR in the animals.

5. **Supply of clean wholesome drinking water :** Water is an essential nutrient that should be offered round the clock. Provide at least one drinker nipple for every five to six piglets. Upgrading the water quality in the weaner areas has resulted in dramatic improvements in young pig performance. The provision of cold water to piglets can waste 5-7% of their heat energy.

B. Environment and housing modifications :

The environment acts as a vital factor for the viability of the piglets during early life especially during weaning or right after weaning.Some essential measures to counteract the stress are discussed below:

1. **Monitoring of temperature :** Temperature is one of the critical micro-environment for animal.Limited ability to regulate body temp. Thus piglets need higher room temperature.It was observed that crushing rate could be increased during thermal stress (Hollis, 2006). Young pigs are sensitive to cold temperatures as they don't possess brown adipose tissue, which causes distress to weaned piglets.For survival of the piglets during cold stress we can use electric heating lamp for supplementing extra heat to the piglets. This will increase their survival rate.
2. **Weaner sty :** Bedding material is the most critical component of indoor housing for any livestock. Straw is the most appropriate bedding material that could be incorporated in the weaner sty as this will provide extra warmth to the piglets. Sty should have draught free environment with minimum temperature fluctuations.

C. Sanitation : Sanitation is the effective method to control pathogen load in the environment and also an important component of bio-security which includes cleaning and disinfection. Thus its application in the farm at regular interval helps to reduce morbidity rate and thereby promote growth in piglets.

Conclusion

Weaning is a stressful condition and it induces stress to the piglets. Reduction of post-weaning mortality can be achieved through proper identification of contributing factors and careful scientific evaluation of reductionstrategies in the herd.

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MILKING SYSTEMS FOR DAIRY CATTLE

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Hand milking

It is suitable for small herd size. It is of three types.

- **Stripping :** Holding the teats between thumb and forefinger and drawing it's down the length. This Process to be repeated in quick succession. Both the hands are used for holding different teats and stripping down alternately.
- **Full hand milking :** Whole teat is held first with the thumb and the index finger encircling the base of the teat. Teat is squeezed between the hollow of the palm and with the middle, ring and index finger.This process is repeated in quick succession. Full hand method is better than the stripping because it is quicker, produce natural suckling stimulation by the calf and causes less irritation to teat by repeated sliding of fingers on teat.
- **Knuckling :** Many milkers tend to bend their thumb against the teat canal and drag the milk out. This practice should be avoided as it is injurious to the teat

Machine milking

In large dairy farms machine milking is more suitable than hand milking because milking consumes maximum labour hours. Machine milking ensures comparatively clean milk production. Animals are milked smoothly and quickly and in uniform way thus increases milk production thereby income. It requires less time for milking a large number of milk animals. Milking machines work on the principle of vacuum.

Basic components of milking machines :

- Vacuum system: vacuum pump and reserve tank, vacuum regulator, pipelines and long pulse tube(s) forming an enclosed space.
- Pulsators: that alter the vacuum level around the teat so that milking occurs without fluid congestion and edema of the teat tissues;
- Milking units or cluster: The assembly of four teat cups connected to a claw and mounted with a valve that admits and cuts off the vacuum to the unit.
- Milk removal system that transport the milk away from the milking unit toward a storage unit: the milk tube and receiver (bucket, recorder jar, milk pipelines, milk pump, etc.)

Portable milking machine system

It is ideal for small herds (upto 20 cows).It can be used when the use of static milking machines is not possible (in the field or barn) or while attending agricultural shows, if the size of herd is small and for sick animals in remote pens. It can also be used in the fields with no electricity as a diesel engine may be attached.

Milk is collected in a stainless steel bucket for further transportation. Options with one or two buckets are available and portable milkers come with one or two clusters.All parts are mounted on a lightweight trolley which can be easily transported and requires minimal maintenance.

Recommended vacuum level for milking a cow with a portable milker is 48-50 kPa and the pulsation rate is set to 60 ppm with ratio 60:40.

Barn Milking System

Barn milking systems are installed on the farms where the cows are kept tied in their cubicles. The milking takes place at the place where the cow is standing. The milking is carried out using a portable milking unit which provides pulsation and delivers vacuum to the teat end.

The milking unit is plugged into the milking station fitted on the milk line.One milking station is usually installed for every two cows. The milk then flows to the milk receiving set.From the milk receiving vessel the milk pumped into the milk cooling tank.

Cleaning-In-Place automated washing system can be installed for efficient cleaning after milking. Good quality washing is achieved using a water slug technique. This water slug is created in the milk line by the air injector valve. The system is easily scalable. A separate milk and vacuum line loop is installed for every 50 cows in the barn.

Milking Parlour System

1) Herringbone milking parlour

Named herringbone as the linear layout and angle of the stalls mimic the shape of the backbone of the herring fish. Cows enter in single file, and line up almost perpendicular to the central passage on both sides, facing outwards. After washing the udder and teats the cups of the milking machine are applied to the cows, from the rear of their hind legs, on both sides of the working area. There will be one milking control for each stall. Large herringbone sheds can milk up to 600 cows efficiently with two people. Typical sizes range from a Double 8/8 through 20/20 which means an identical number of stalls on each side of the parlour. The stall angle ranges from 30 to 90 degrees.

2) Swing-over milking parlour

Swingoverparlours are the same as herringbone parlours except they have only one set of milking cups to be shared between the two rows of cows, as one side is being milked the cows on the other side are moved out and replaced with unmilked ones; with the notation 8/16 or 20/40. The swingover style uses half the number of milking controller as one control is used for both sides of the parlour. It is a cheaper option to a doubled up parlour.

3) Rapid exit parallel milking parlour

The Rapid Exit stall work is growing in popularity as they allow fast throughput by locating the exit gates in front of the cow stall. Also the building does not need to be long as for herringbone, but needs to be wide. The vacuum operated gate lift allows cows to exit en-mass and aids fast reloading of the stalls.

4) Rotary milking parlours

With growing herd size the efficiency of the herringbone parlour is reduced when the size goes beyond 20 points per side due to the length of the parlour.The most efficient parlour for the large herd is the Rotary Platform parlour. A turntable with about 12 to 100 individual stalls for cows around the outer edge. The turntable is turned by an electric-motor drive at a rate that one turn is the time for a cow to be milked completely.As an empty stall passes the entrance a cow steps on, facing the centre, and rotates with the turntable. The next cow moves into the next vacant stall and so on. The milker, cleans the teats, attaches the cups. The milker, or an automatic device, removes the milking machine cups and the cow backs out and leaves at an exit just before the entrance. The rotary system is capable of milking very large herds: over a thousand cows. It allows for only 2 operators to milk 250 cows per hour on a typical 60 point platform.

Automatic Milking Systems (AMS)

It involves complete automation of the milking process. AMS has been available commercially since the early 1990s. Most farms with AMS located in the Netherlands and Denmark. Milking unit consists of a milking machine, a teat position sensor, a robotic arm for automatic teat-cup application and removal, and a gate system for controlling cow traffic. Typical capacity for a AMS is 50-70 cows per milking unit. AMS usually achieve milking frequencies between 2 and 3 times per day, so a single milking unit handling 60 cows and milking each cow 3 times per day has a capacity of 7.5 cows per hour. When the cow elects to enter the milking unit (due to highly palatable feed that she finds in the milking box), a cow ID sensor reads an identification tag on the cow and passes the cow ID to the control system. If cow has been milked too recently, the automatic gate system sends the cow out the unit. If the cow may be milked, automatic teat cleaning, milking cup application, milking, and teat dipping takes place.

Advantages of AMS

- ❖ Elimination of labour: The farmer freed from the milking process and associated rigid schedule, and labour devoted to supervision of animals, feeding, etc.
- ❖ Increased milking frequency: Milking frequency may increase to three times per day, however typically 2.5 times per day is achieved. Resulting in less stress on the udder and increased comfort for the cow, as on average less milk is stored.

- **Perceived lower stress environment :** There is a perception that elective milking schedules reduce cow stress.
- **Herd Management :** The use of computer control allows greater scope for data collection helping the farmer to improve management through analysis of trends in the herd, for example response of milk production to changes in feedstuffs.

  Individual cow histories may also be examined, and alerts set to warn the farmer of unusual changes indicating illness or injury.

Disadvantages of AMS

- High initial cost
- Increased complexity
- Difficult to apply in pasture systems
- Lower milk quality:higher Somatic cell count (SCC) than conventionally milked herds.
- Possible increase in stress for some cows: Cows are social animals, and it has been found that due to dominance of some cows, others will be forced to milk only at night.
- Decreased contact between farmer and herd

SUGGESTIONS FOR MINIMUM STANDARDS OF VETERINARY PRACTICES REGULATION (MSVPR) AND NEED OF CHANGE IN THE VCI ACTS 1984 IN THE INTEREST OF VETERINARY PROFESSION

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INTRODUCTION

India is first in milk production in the world production with 198 million tonnes in 2020 from 125.43 million milch cows and buffaloes and the projected milk production increases to 208 million tonnes in 2021. Milk production in India has increased from 146.3 million tonnes in 2014-15 to 198.4 million tonnes in 2019-20. India has vast resource of livestock and poultry, which plays a vital role in improving the socio-economic conditions of rural masses. There are about 300.00 million bovines 65.07 million sheep, 135.2 million goats and about 10.3 million pigs as per 19th Livestock Census in the country. India has vast resource of livestock and poultry, which plays a vital role in improving the socio-economic conditions of rural masses. There are about 300.00 million bovines 65.07 million sheep, 135.2 million goats and about 10.3 million pigs as per 19th Livestock Census in the country.

There is increase in the contribution of livesctock to GDP of country which accounts for more than 40% of total agricultural sector and more than 12% of GDP Livestock provide milk, meat, draft power, hides and skins, manure and other valuable by products thus significantly contributing to sustainable human nutrition and economy of the nation.It forms an important livelihood activity for most of the farmers, supporting agriculture in the form of critical inputs, contributing to the health and nutrition of the household, supplementing incomes, offering employment opportunities, and finally being a dependable "bank on hooves" in times of need. It acts as a supplementary and complementary enterprise.

Dairy sector also plays an important role in achieving food security, reducing global poverty, generating employment opportunities for women, and providing a regular source of income for rural households. Moreover, in developing economies, landless and poor farmers are actively involved in dairying as an essential means of livelihood. Dairying is equally important in developing economies like India, for providing nutrition support, reducing rural poverty, inequity, ensuring food security for millions of rural households, and enhancing economic growth, particularly in rural areas. While world milk production during 2017 stood at 849 MMT (million metric tonnes) or 232 crore litres per day, India alone accounted for almost 20% of this, at 174 MMT, followed by the US with 97.7 MMT. Going ahead, India's milk production is expected to outperform global production and grow to 185 MMT per annum, and surpass the EU to emerge as the largest dairy producer by 2020.

In the 1950s and 1960s, India was a milk deficit country, depending mostly on imports. In 1965, the government of India established the National Dairy Development Board to direct India's dairy sector development. In 1970, the government launched Operation Flood (OF), the world's largest dairy development programme, whose aim was enhancing milk production in the country. By 1998, India overtook the US to become the largest milk producer in the world, and it contributed 22 per cent of the global milk production in 2018. Between 1991 and 2018, the per capita availability of milk increased from 178 (gm/day) to 394 (gm/day). During this period, milk production in India increased from 55.6 million tonnes to 187.7 million tonnes, and growing at 4 per cent compounded annually. As per the NITI Aayog working group 2018 report, milk production in India will increase to around 330 million tonnes in 2032-33, and milk supply will exceed

milk demand by 38 million tonnes in 2032-33. As per the National Action Plan on Dairy Development vision 2022 report, it is envisioned to increase milk procurement and processing through setting up of village-level dairy infrastructure. Under this plan, organised milk handling is to be increased to 41 per cent by 2022 and to 50 per cent by 2023-24. Milk procurement by cooperatives will increase from 10 per cent in 2020 to 20 per cent in 2023, and milk procurement by the private sector will be increased from 10 per cent to 30 per cent in the same period.

The dairy market in India reached a value of INR 11,357 Billion in 2020. Looking forward, IMARC Group expects the market to grow at a CAGR of 15.4% during 2021-2026.The dairy sector is one of the crucial sectors in the Indian economy that not only provides employment to millions of rural households but also contributes to the economy. Among the livestock products, milk consists of the highest share, and it accounted for 67.2 per cent of the livestock sector in 2017.

Annually, 8.4 million farmers depend on the dairy sector for their livelihoods, out of which 71 per cent are women (Agriculture Skill Council of India). Furthermore, in a year, crop production employs the rural workforce for 90 to 120 days, but dairy provides alternative employment opportunities throughout the 365 days of the year.On a regional level, the market has been classified into Uttar Pradesh, Rajasthan, Gujarat, Madhya Pradesh, Andhra Pradesh, and Punjab, where Uttar Pradesh currently dominates the dairy industry in India.

The recent Covid-19 pandemic has affected different sectors of the economy and has reduced employment opportunities, particularly for migrant workers. As per the 2011 Census, India has 45.36 crore internal migrants, which includes both within-State and inter-State migrants; the latter have been hit hardest, due to pandemic enforced restriction on inter-State movements. When these migrant labourers return to their homes, this reverse migration will create new challenges for them, as the lack of employment prospects at the village level will make their life more difficult.

This is a great opportunity for the State governments to promote dairy business in those districts where milk production and milk availability are less than the national average. They can facilitate the promotion of the cooperative model in these regions, to channelise and formalise milk procurement, which will help millions of people to be gainfully employed.

Requirement of Minimum Veterinary Practice Standards

Each veterinary licensee shall comply with the following:

Medical Records

A legible individual record shall be maintained for each animal. However, the medical record for a litter may be recorded either on the dam's record or on a litter record until the individual animals are permanently placed or reach the age of three months. Records for herd or flock animals may be maintained on a group or client basis. All records shall be readily retrievable and must be kept for a minimum of three (3) years following the last treatment or examination. Records shall include, but are not limited to, the following information: (a) Name or initials of the veterinarian responsible for entries; any written entry to a medical record that is made subsequent to the date of treatment or service must include the date that the entry was added. (b) Name, address and telephone number of the owner and/or client; (c) Name, number or other identification of the animal and/or herd or flock; (d) Species, breed, age, sex, and color or distinctive markings, where applicable, each individual animal; (e) Vaccination history, if known, shall be part of the medical record; (f) Beginning and ending dates of custody of the animal; (g) Pertinent history and presenting complaint; (h) A physical exam shall be performed to establish or maintain a VCPR; and then each time an animal is presented with a new health problem, unless the animal's temperament precludes examination, or physical exam is declined by the owner.

Physical Examination

For each physical exam the following conditions shall be evaluated and findings documented when applicable by species, even if such condition is normal: (A) Temperature; (B) Current weight or weight estimate for large animals; (C) Body condition or score; (D) Eyes, ears, nose and throat; (E) Oral cavity; (F) Cardiovascular and respiratory systems including heart rate and pulse, auscultation of the thorax, trachea, as species appropriate, and respiratory rate; (G) Evaluation of the abdomen by palpation and/or auscultation if applicable by species; (H) Lymph nodes; (I) Musculoskeletal system; (J) Neurological system; (K) Genito/urinary system; (L) Integumentary system (M) All data obtained by

instrumentation; (N) Diagnostic assessment; (O) If relevant, a prognosis of the animal's condition; (P) Diagnosis or tentative diagnosis at the beginning of custody of animal; (Q) Treatments and intended treatment plan, medications, immunizations administered, dosages, frequency and route of administration; (R) All prescription or legend drugs dispensed, ordered or prescribed shall be recorded including: dosage, frequency, quantity and directions for use. Any changes made by telecommunications shall be recorded. Legend drugs in original unopened manufacturer's packaging dispensed or ordered for herd use are exempt from this rule.

Legend and prescription drugs are as defined by the U.S. Food and Drug Administration in 'FDA and the Veterinarian'. (S) Surgical procedures shall be described including name of the surgeon, suture material used, and diagnostic findings; (T) Progress of the case while in the veterinary medical facility; (U) Exposed radiographs shall have permanent facility and animal identification; (V) If a client waives or declines any examinations, tests, or other recommended treatments, such waiver or denial shall be noted in the records. (2) Surgery: Surgery shall be performed in a manner compatible with current veterinary practice with regard to anesthesia, asepsis or antisepsis, life support and monitoring procedures and recovery care.

Theminimum standards for surgery :

(a) Aseptic surgery shall be performed in a room or area designated for that purpose and isolated from other activities during the procedure. A separate, designated area is not necessarily required for herd or flock animal surgery or antiseptic surgery; (b) The surgery room or area shall be clean, orderly, well-lighted and maintained in a sanitary condition; (c) All appropriate equipment shall be sterilized: (A) Chemical disinfection ("cold sterilization") shall be used only for field conditions or antiseptic surgical procedures; (B) Provisions for sterilization shall include a steam pressure sterilizer (autoclave) or gas sterilizer (e.g., ethylene oxide) or equivalent. (d) For each aseptic surgical procedure, a separate sterile surgical pack shall be used for each animal. Surgeons and surgical assistants shall use aseptic technique throughout the entire surgical procedure; (e) Minor surgical procedures shall be performed at least under antiseptic surgical techniques; (f) All animals shall be prepared for surgery as follows: (A) Clip and surgically prepare the surgical area for aseptic surgical procedures; (B) Loose hair must be removed from the surgical area; (C) Scrub the surgical area with appropriate surgical soap; (D) Disinfect the surgical area; (E) Drape the surgical area appropriately.

A veterinarian shall use appropriate and humane methods of anesthesia, analgesia and sedation to minimize pain and distress during any procedures or conditions and shall comply with the following standards: (a) Animals shall have a documented physical exam conducted within 24 hours prior to the administration of a sedative or anesthetic, which is necessary for veterinary procedures, unless the temperament of the patient precludes an exam prior to the use of chemical restraint; (b) An animal under general anesthesia for a medical or surgical procedure shall be under direct observation throughout the anesthetic period and during recovery from anesthesia until the patient is awake and in sternal recumbency; (c) A method of cardiac monitoring shall be employed to assess heart rate and rhythm repeatedly during anesthesia and may include a stethoscope or electronic monitor; (d) A method of monitoring the respiratory system shall be employed to assess respiratory rate and pattern repeatedly during anesthesia and may include a stethoscope or electronic monitor. (e) Where general anesthesia is performed in a hospital or clinic for companion animal species (excluding farm animals), anesthetic equipment available shall include an oxygen source, equipment to maintain an open airway and a stethoscope; (f) Anesthetic and sedation procedures and anesthetic and sedative medications used shall be documented, including agent used, dosage, route of administration, and strength, if available in more than one strength; (g) Adequate means for resuscitation including intravenous catheter and fluids shall be available; (h) Emergency drugs shall be immediately available at all times; (i) While under sedation or general anesthesia, materials shall be provided to help prevent loss of body heat; (j) Analgesic medications, techniques and/or husbandry methods shall be used to prevent and minimize pain in animals experiencing or expected to experience pain, including but not limited to all surgical procedures; (k) Chemical restraint may be used in conjunction with, but not in lieu of, analgesic therapy; (l) Appropriate analgesic therapy shall be guided by information specific to each case, including but not limited to species, breed, patient health and behavioral characteristics, the procedure performed, and the expected degree and duration of pain;

Library: A library of appropriate and current veterinary journals and textbooks or access to veterinary internet resources shall be available for ready reference.

Laboratory : Veterinarians shall have the capability for use of either in-house or outside laboratory service for appropriate diagnostic testing of animal samples.

Biologicals and drugs : The minimum standards for drug procedures shall be: (a) All biological substances shall be stored, maintained, administered, dispensed and prescribed in compliance with federal and state laws and manufacturers' recommendations; (b) Controlled substances and legend drugs shall be dispensed, ordered or prescribed based on a VCPR and shall be labeled with the following: (A) Name of client and identification of animal(s); (B) Date dispensed; (C) Complete directions for use; (D) Name, strength, dosage and the amount of the drug dispensed; (E) Manufacturer's expiration date; (F) Name of prescribing veterinarian and veterinary medical facility. (c) No biological or drug shall be administered or dispensed after the expiration date, for a fee. (d) If requested, a prescription shall be provided to a client for medications prescribed by the veterinarian under a valid VCPR. (7) A veterinarian shall not use or participate in the use of any form of advertising or solicitation which contains a false, deceptive or misleading statement or claim.

NAVEL ILL IN CALF: A CASE STUDY

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Summary : A 4-day old female Murrah calf was presented to the veterinary hospital, Sirpur, Mahasamund (C.G.) with symptoms of navel ill. Navel ill is a condition in the umbilicus characterized by inflammation as a result of infection of bacterial origin. The calf was treated with streptopenicillin, meloxicam, and nitrofurazone ointment for 5 days along with a regular dressing of the wound. The line of treatment showeda remarkable improvement in the health of the calf. It is recommended to adopt hygienic measuresin the initial days of life of the calf to reduce the occurrence of navel ill.

Introduction : A bacterial disease of young calves, especially less than 1-week of age, occurring due to the infection entering via the umbilical cord at the time of birth or soon after birth is navel ill or omphalitis. The navel ill is a local infection with a prevalence of 5-15% in newborn calves. Calves that are untreated for navel ill may spread the infection from the navel to other parts of the body, generally joints, via the bloodstream, causing joint ill. Joint ill is a generalized infection. The eyes, heart, brain, kidney, and liver are the other sites of infection. Few deaths have been reported in the latter cases due to the poor metabolism rate, as a result of septicaemia, meningitis, and abscesses in the liver and kidneys. The infection gives birth to a variety of symptoms depending on the location of the bacteria.

If the infection persists mostly in the navel region, the calves are presented with a swollen, painful, and moist navel, depressed appetite, and high temperature sometimes, following which an abscess may develop containing thick custard-like pus. The calf must be treated at this stage.The calf left untreated develops inflammation in joints, characterized by swelling, pain, and stiffness in joints. Besides, the calf shows less tendency to move.Such conditions prevail when the calf is born or kept in unsanitary conditions like places having dung or fly menace. The real cause is E. coli causing abscesses in internal organs, septicaemia, and sudden death of animals.

A case study : A female buffalo calf of approximately 30 kg was presented to the veterinary hospital, Sirpur, Mahasamund (C.G.) with swollen, painful, moist navel and inappetence. The calf was alert at the time of presentation. On history taking, it was found that the calf was born 04 days ago to a Murrah buffalo and that the calf was kept in a place frequently wet with rains, giving rise to unhygienic conditions. The owner further did not deny the menace of flies in the place. The calf was observed showing very little interest in the movement and had a body condition score of 2.0 out of 5.0. On

physical examination, the calf was found to have a higher body temperature (pyrexia) of 103.2□F. The respiration and pulse rates were near to the normal range. The mucus membrane colour was pink and did not show any signs of anaemia. Simultaneously, on palpation of the navel region, pus formation (abscess) was noticed. Based on the symptoms, the calf was diagnosed with the navel ill disease and treated with the following medications.

Treatment :

1. A small incision was made aseptically at the site of pus formation (closed abscess) to drain the pus and remove the caseous material. The site was then washed with 1% KMnO4solution and painted with tincture of iodine, and left open to dry.
2. An intramuscular injection of streptopenicillin1.2 ml (1.0 ml/ 25 kg body weight) was administered to the calf once daily for 5 days.
3. An intramuscular injection of meloxicam and paracetamol 3.0 ml (1.0 ml/ 10 kg body weight) was administered to the calf once on day 1.
4. On the subsequent day, pus was drained again, and the wound was washed with 1%KMnO4 solution and smeared with nitrofurazone ointment. The dressing of the wound was continuedfor the next 4 days.
5. The combination of meloxicam and paracetamol injection was replaced with an intramuscular injection of meloxicam 3.0 ml (1.0 ml/ 10 kg body weight) for the next 4 days.
6. The wound was sprayed with Topicure spray to prevent the infestation of maggots, bacterial and fungal growth, and check the fly menace.
7. A multivitamin injection with liver extract, Bovoplex-cc, was injected intramuscularly @ 5 ml in alternate days upto the 5th day of treatment to increase the metabolism and appetite.
8. A tremendous improvement in the health of the calf was noticed after 5 days of treatment with the swelling subsiding and wound showing granulation. The calf developed a good appetite for milk and started showing movements.
9. In some cases, maggots may also develop in the wound and should be treated with the removal of maggots manually following simultaneous use of turpentine oil. Later, washing with 1% KmNO4 solution and packing the wound with a turpentine oil gauge should be done. On the subsequent day, cleaning of the wound with hydrogen peroxide and application of ointment should be carried out. The medications as discussed above will remain the same.

Prevention :

Navel ill can be prevented through the following management practices.

1. Make sure the calf is born in a clean hygienic environment.
2. Cut the navel cord soon after the birth leaving 2-3 inches from the stalk, and dip it in a 7% tincture of iodine.
3. Provide dry clean bedding to the calf.
4. Provide an adequate amount of colostrum to the calf as early as within 1 hour of birth and twice to thrice daily. Provide colostrum to the calf @ 5-8% of its birth weight on the 1st day, and 10% on the 2nd and 3rd day.
5. Repeated application of povidone iodine solution on navel cord should be carried out till it dries.

Conclusion :

Navel ill is a condition in the umbilicus of young ones of usually less than 1-week of age, caused due to the bacterial infection, as a result of unhygienic conditions around the young ones and inadequate navel treatment. The umbilical management by removal of pus and caseous materials from a closed abscess, systemic antibiotic therapy using

streptopenicillin, and topical antisepsis is effective in the treatment of navel ill. The owner is advised to maintain hygiene around the young ones and ensure adequate availability of colostrum to reduce the chances of navel ill.

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Zoonotic Parasitic Diseases in Northeast: A Public Health Concern!!

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The north eastern states of India, constitutes seven sisters and one brother state with a vast geographical area distributed among Assam, Nagaland, Manipur, Arunachal Pradesh, Sikkim, Mizoram, Tripura and Meghalaya. The total geographical area of 2,76,300 square kilometers (approximately) includes fifty five percent of under rich forest diversity with wild flora and fauna and forty five percent is utilized by human beings for inhabitation or cultivation purpose. The majority of populations in these states are traditionally dependent on livestock and forest produce for their livelihood. Northeast states are having distinct climate variations within short ranges due to changes in topography and conditions are conducive for the transmission of zoonotic diseases.

Any disease or infection that is naturally transmissible from vertebrate animals to humans and vice-versa is called as zoonoses. Altogether parasitic, bacterial, viral and rickettsial zoonotic diseases are estimated to cause 2.5 billon cases of human illness and 2.7 million human deaths a year. Due to northeastern states climatic condition, suboptimal sanitation infrastructure and scarce veterinary and medical services, the parasites may be prevalent more in this region. Parasitic zoonoses affects human and animal health directly and consequently affect livestock production. Factors such as poverty, lack of personal hygiene, defecating in open spaces, scarcity of potable water, abundance of stray animals, high population density and certain culinary habits are responsible for the rising prevalence of this zoonoses which includes human fasciolopsis, paragonimiasis, taeniasis; cysticercosis, echinococcosis; hydatidosis, toxoplasmosis, cryptosporidiosis, gnathostomiasis, dirofilariasis and other important helminthic diseases. Following are the Parasitic zoonoses with a public health concern in north east:

Fasciolopsiasis

Fasciolopsiais caused by Fasciolopsis buski is the largest intestinal fluke which is found in the intestines of humans and pigs. The eggs released from the intestine of human will release miracidia and finds a freshwater snail host where it undergoes different developmental stage and

the released cercaria will be encysted as metacercariae on aquatic, edible plants. The prevalence of fasciolopiasis is related to consume these plants by human or pigs causes this infection. Fasciolopsiasis is endemic where pigs are raised and fed with freshwater plants in subtropical north-east hilly region.

Paragonimiasis

Paragonimiasis is a food-borne parasitic infection caused by the lung fluke, most commonly by Paragonimus. The infection occurs by eating undercooked or pickled crustaceans that may be carrying the metacercariae of Paragonimus spp. and human infection takes place by eating raw boar or pig meat because these animals serve as paratenic hosts. The first indigenous case of human paragonimiasis was described from Manipur, demonstrated ova in the sputum and identified as Paragonimus spp. Paragonimiasis cases have been detected almost every year in Manipur. Parasitological and immunological surveys revealed that paragonimiasis has been hyperendemic in parts of Arunachal Pradesh, Nagaland with more male population got infection than female and in Nagaland, half of the patients attending the TB clinic are actually suffering from pulmonary paragonimiasis by P. heterotremus. Therefore, a recommendation to give a special attention to paragonimiasis while diagnosing for TB in Assam, Arunachal Pradesh, Manipur and Nagaland.

Cysticercosis and Taeniosis

Cysticercosis is caused by Cysticerus cellulosae, the larval form of the tape worm Taenia solium. Humans acquire cysticercosis through faeco-oral contamination with Taenia solium eggs from tape worm carriers. Taeniosis is due to ingestion of undercooked pork contaminated with cysticerci or tissue cysticercosis in the subcutaneous tissue, muscle, or organs due to ingestion of viable eggs released from the worm carriers (taeniosis patients). The occurrence of C. cellulosae in the muscles of pigs is very well established in different places of north eastern states. C. bovis has also been observed in cattle and buffaloes. The human occupants having close contact with domestic animals round the

year may expose to many animal borne diseases especially human cysticercosis. Cases of cysticercosis have been reported from Shillong and other states indicates that the infection rate could be high among the human populations since large numbers of people are eating pork as their main food and their method of preparation is different from usual method.

Toxoplasmosis

Toxoplasma gondii is a coccidian protozoan parasite of felids with a wide range of intermediate hosts that include all warm blooded animals including humans. Patients with HIV/AIDS are infected with opportunistic pathogen of T. gondii with central nervous system involvements. The reports of the prevalence of T. gondii from animals in Northeast India are scanty. A serological survey for T. gondii antibodies in free-ranging mithuns of Nagaland, has revealed the overall seroprevalence of anti T. gondii antibodies was 42%. Toxoplasmosis has been recognized for abortion and neonatal mortality in sheep and goats in Arunachal Pradesh indicating the zoonotic potential of the parasite in north eastern states, however, there are very few reports on the prevalence of this parasitic infection among pregnant women and infants of northeastern states. Toxoplasmosis is an occupational zoonosis also and infects more frequently the groups like veterinarians, pet keepers and farmers.

Cryptosporidiosis

This is the most common opportunistic parasite in HIV/AIDS patients and causes life threatening chronic diarrhea in immune-compromised individuals and is caused by Cryptosporidium parvum. Cryptosporidium oocysts are also detected in drinking water supplies. Its prevalence increases in rainy season and hospital based reports indicate the presence of infection in north east states.

Dirofilariasis

The natural hosts for the Dirofilaria species that cause infection in man are dogs and wild canines like foxes, wolves and raccoons. Infected mosquito occasionally infect human with the third stage larvae during a blood meal. In man, D. repens usually wanders in the subcutaneous tissue and produces a granulomatous nodule. Dirofilariasis is an emerging zoonotic disease. Cases of a subcutaneous human dirofilariasis caused by filarial worms of the genus Dirofilaria been reported in this regions of Assam. D. immitis in dogs has been reported from Mizoram, Nagaland and Assam.

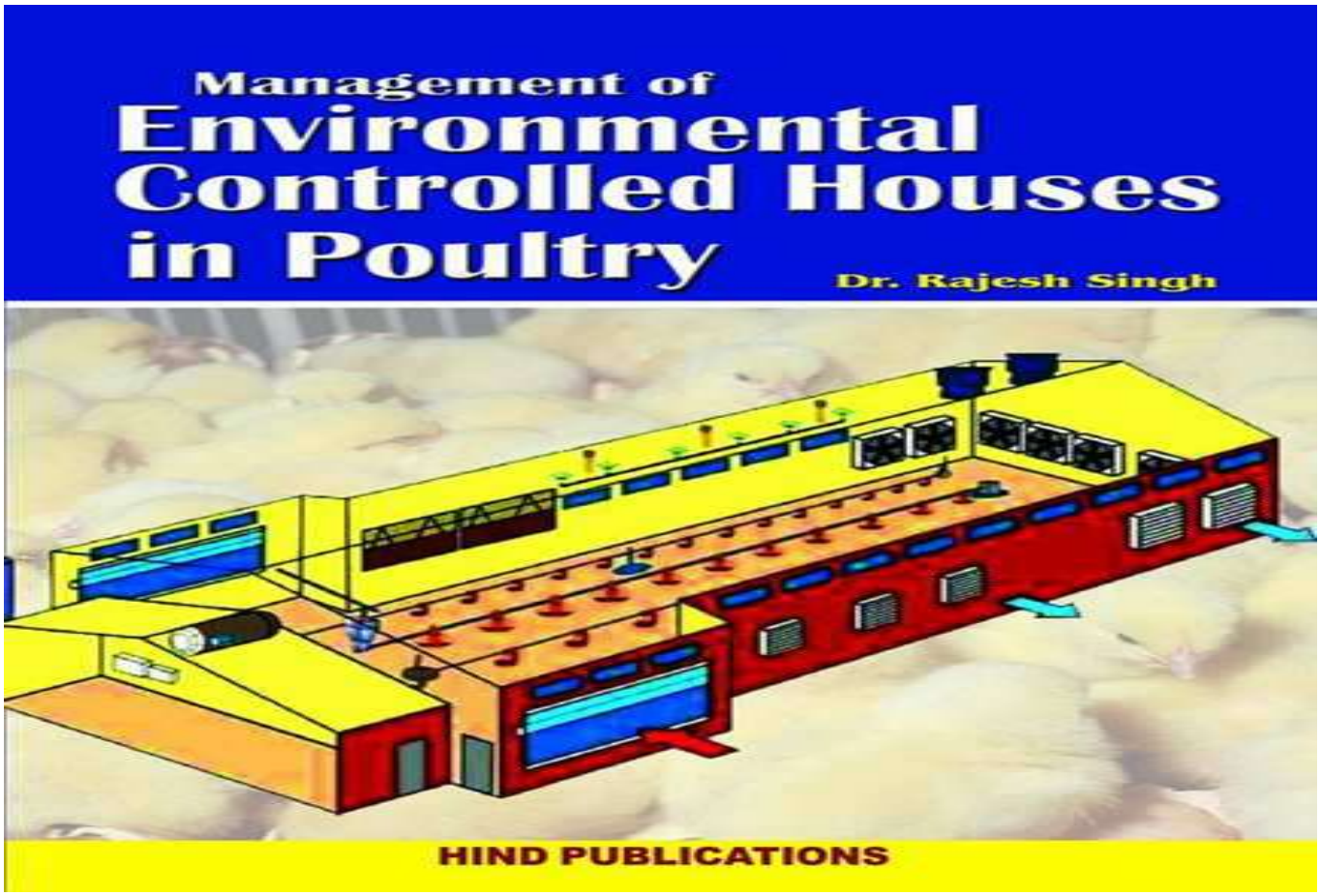
Gnathostomiasis Gnathostoma spinigerum is a parasitic nematode that causes gnathostomiasis and the clinical manifestations are called creeping eruption, larva migrans. The larval nematode is acquired by eating raw or undercooked fish and meat. Ocular involvement with G. spinigerum occurs years after the initial infection that is acquired by ingestion of poorly cooked, pickled seafood or water contaminated with third stage larvae. The zoonotic parasite is widely prevalent among the animal species in the north east regions. A number of human cases of intraocular gnathostomiasis have been reported from Assam, Meghalaya and erythematous skin lesions from Manipur.

Hydatidosis

E. granulosus has a wide geographical distribution in livestock and becoming an increasing risk for human health. Hydatidosis is caused by a metacestode (larval stage) of Echinococcus species. E. granulosus distribution is higher in developing countries, especially in rural communities where there is a close contact between the dog, the definitive host, and various domestic animals, which may act as intermediate hosts. Prevalence of this parasitic infection in carcasses of yak in Arunachal Pradesh, pigs of Assam, Mithun, Cattle, Buffaloes in Nagaland and dogs of Mizoram, Assam increases the significance of it as public health importance disease in the region. However, there is no record of hydatidosis from human in the region.

Climatic change associated with global warming, increased vector populations, globalization, extensive deforestation for agricultural cultivations and human occupation, which are indirectly causes instability and movement of wild life, the large demand for livestock food products, the lack of safe drinking water, the large number of stray animals, certain cooking practices, outdoor defecation, lack of personal hygiene, and the high population density are responsible for the rising prevalence of parasitic zoonoses. In this changing scenario, food safety is of the utmost importance. There is a need for better coordination of medical and veterinary sciences along with improvement in collaborative approaches to formulate appropriate control strategies.

Nagaland, state of India, lying in the hills and mountains of the northeastern part of the country. It is one of the smaller states of India. Nagaland is bounded by the Indian states of Arunachal Pradesh to the northeast, Manipur to the south, and Assam to the west and northwest and the country of Myanmar (Burma) to the east. The state capital is Kohima, located in the southern part of Nagaland. Area 6,401 square miles (16,579 square km). The Nagas, an Indo-Asiatic people, form more than 20 tribes, as well as numerous subtribes, and each one has a specific geographic distribution. Nagaland has a monsoonal (wet-dry) climate. Annual rainfall averages between 70 and 100 inches (1,800 and 2,500 mm) and is concentrated in the months of the southwest monsoon (May to September). Average temperatures decrease with greater elevation; in the summer temperatures range from the low 70s F (about 21–23°C) to the low 100s F (about 38–40°C), while in the winter they rarely drop below 40 □F (4 □C), though frost is common at higher elevations. Humidity levels are generally high throughout the state. Forests cover about one-sixth of Nagaland. Below 4,000 feet (1,220 metres) are tropical and subtropical evergreen forests, containing palms, rattan, and bamboo, as well as valuable timber species (notably mahogany). Coniferous forests are found at higher elevations. Areas cleared for jhum (shifting cultivation) have a secondary growth of high grass, reeds, and scrub jungle. Elephants, tigers, leopards, bears, several kinds of monkeys, sambar deer, buffalo, wild oxen, and the occasional rhinoceros live in the lower hills. Porcupines, pangolins (scaly anteaters), wild dogs, foxes, civet cats, and mongooses also are found in the state. Agriculture employs about nine-tenths of the population. Forestry is also a primary source of income and employment. More than four-fifths of Nagaland's population is literate, which is higher than the national average. The state has placed considerable emphasis on public health. It has programs for treating tuberculosis and malaria and for improving drinking water supplies. Nagaland, however, still has to depend on imports of food from neighbouring states. The widespread practice of jhum has led to soil erosion and loss of soil fertility.



COLIC IN HORSES

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Ask most horse owners, and their number one fear for their horses is colic. To reducecolic we must first understand all the contributing factors that have a role in causingcolic. The shame of it is that there are many factors that cause colic and they aremostly due to man's mismanagement of horses.

Horses evolved in Asia and the Middle East in an arid environment. They were designed to be foragers as they are a hindgut herbivore. Due to their evolution in this environment, horses were forced to forage large areas (up to 20 miles per day) in order to get enough to eat. Horses have a small stomach only representing 7% of their digestive tract. Therefore they need to graze almost continuously. They selectively graze those plants that are the most nutritious. On occasion they would eat grass seeds but never in great quantity. As man domesticated the species, confinement was implemented and the horse's whole way of life changed. Parasites also became a problem because of confinement to small areas. Horses are fed at man's convenience which led to a change from a continuous forager to a meal eater, whereby the majority of the dietary energy is derived from grains. Most of the time, colic is due to feeding mismanagement resulting from a poor understanding of the horse's digestive tract.

An increased risk of colic is associated with certain factors :

- Relationship to farm size showed an increase in colic as farm size decreased.
- Being stalled more than 50% of the time and a recent change in housing was associated with an increased risk of colic.
- Horses that were outside drinking had less risk than horses that were stalled watering from a bucket.
- Primary use of the horse (breeding, racing etc.) was not associated with colic, however a change in activity was.
- There was no relationship of feeding a vitamin, mineral, protein or fat supplement with colic.

Colic Risk Factors :

- Recent change in diet
- Recent change in type of hay
- History of previous episodes of colic
- Horses stabled as opposed to pasture
- Recent change in housing
- Failure to deworm regularly
- History of recent deworming

Colic Prevention Program

1. **Practice Good Parasite Control :** A series of fecal exams to detect the presence of worms would give a baseline assessment of the parasite level in the herd. Based on these results, a deworming schedule should be set up accordingly. Choose an anthelmintic that is broad in spectrum and safe for the class of horses and the level of infection present. Being overly aggressive in the choice of "purge deworming" products can have disastrous results, and consulting with your veterinarian about his/her recommendations about the types of products available is wise.
2. **Regular Dental Care :** A horse's teeth grow 1/8 inch per year and need to be floated annually. Grinding of grain contributes to reduced particle size and allows for salivation, with amylase aiding in the digestive process. Hay needs to be chewed thoroughly in order to aid the prevention of impaction. Horses with dental pain often shortcut

chewing and therefore miss many of the benefits of their ration, because of this there is an increase in the incidence of choking that occurs in horses with dental pain.

3. **Grain or Concentrate :** Feed a grain or concentrate that minimizes starch content (low nonstructural carbohydrate -a starch measurement in feed) and includes other energy sources such as fat and digestible fiber.
   - Always feed grains/concentrates at least twice a day and never feed more than 0.5% of body weight at any one feeding.
   - Processed feeds (pelleting, steam flaked etc.) increase starch gelatinization, thereby increasing pre-cecal digestion. The increase in pre-cecal digestion reduces the risk of starch spilling into the cecum and colon, therefore lowering the risk of colic.
   - Starch that is not digested pre-cecally enters the cecum where it can cause gas production, lactic acidosis, loss of the bacterial flora, endotoxin production, colic and laminitis.
   - Other factors that contribute to colic are: the source of starch, the amount of grain processing, the amount of feed being fed, the type/level of fiber in the diet, the timing of the feeding and the individual needs of the horse. These facts emphasize the importance of proper feed management.
4. **Timing of Feeding :** Again remember that horses are continuous eaters so meals should be evenly spaced and if a meal is late, never feed more to make up for it. It is better to feed a little more hay and even reduce the amount of concentrate for that meal. Go back to normal feeding the next time.
5. **Hay/pasture :** Horses experience colic less while on pasture. It allows them to graze continually and also provides exercise. Pastures are the best way to feed a horse; it also reduces feed and labor costs.
   - Keep in mind that horses grazing on pasture can be problematic because of the variations in the weather throughout the year. For this reason hay should also be available when grass gets short.
   - Practice some form of a pasture rotation system, mowing pastures frequently is a good way to keep it vegetative. The nutrient content is higher and the digestibility is increased when the pasture is immature.
   - Lush high moisture pasture can cause colic, particularly when horses are first turned in. For this reason a slow introduction and a gradual increase in the time that they are allowed on pasture is critical.
   - It is also a good idea to feed hay to the horses before they are allowed on pasture.
   - As a general rule, hay should always be fed at a minimum of 1% of body weight when horses are kept in confinement.
6. **Individual Feeding :** Feeding horses individually in stalls, pens or by tying the horse up is an ideal situation. This way they can be fed according to body weight and condition without fear of competition. Competition can cause a horse to bolt its feed (rapid ingestion and swallowing), allowing a dominant horse to overeat. Competition also increases the risk of injury.
7. **Dietary Changes :** Remember that we are feeding the "bugs" rather than the horse. In the colon and cecum, millions of bacteria and protozoa reside where they digest fiber for the benefit of the horse. It takes time for this microbial flora to adapt to a dietary change. Gradually increase the new feed mixed in with the old feed over a 7-10 day period.
8. **Water :** Fresh clean water is imperative. Decreased water consumption will contribute to impaction in the colon and cecum. Water consumption is based on palatability, temperature and availability. High solids, high mineral content and contamination are reasons that can lower intake. Many times at the start of winter, water intake drops because horses are not used to cold water. Impaction colics start about the second day after water intake decreases. In addition to this problem, horses will also lower their water consumption in the face of poor water quality which may be caused by some forms of algae that are toxic.
9. **Moldy Feed/Hay/Toxic Plants :** Moldy feedstuffs should be avoided. Horses will not eat moldy hay if they have a choice. Sometimes baled hay will include toxic weeds and plants; therefore you should feed hay that is weed free. Careful inspection of feed and hay is a must.
10. **Foreign Material, Sand, Wood, Beddingetc :** Indigestible materials will create problems if ingestion is significant.

Sand is a problem when horses spill feed and attempt to eat it off the ground. Sand accumulates in the intestinal tract and will cause colic. This is another reason to tie horses while they are eating and then turning them out to pasture when they are done. Many times a deficiency of roughage will cause horses to eat wood or bedding. Likewise a salt or mineral deficiency will also cause horses to lick and chew on fences, trees etc.

11. **Blister Beetles :** These are found in fields of alfalfa and are extremely toxic to horses causing a severe colic. Alfalfa that is beetle free is a must and responsible alfalfa dealers and growers should supply your roughages. Alfalfa that is from a 1st or 2nd cutting is the safest.
12. **Exercise :** Feeding should be at least 2 hours prior to or after exercise. Grain feeding should be withheld 8 hours prior to strenuous exercise; hay should be given in small portions in multiple feedings the day of the event. Water should be available free choice.
13. **Weigh Horses and Feed :** Horses should be weighed preferably by scale. If a scale is not available, then a weight tape can be used. Feed according to feed manufacturer's recommendations using a horse's weight and body condition. Feed by weight and not by volume. The weight of different feeds varies widely according to the density of the feed. A coffee can or scoop is fine but you should know the weight of a volume measurement.
14. **Fast Eaters :** Horses that tend to bolt their feed (large bites with minimal chewing) should be fed in large bottom troughs where the feed can spread out. Some people have used smooth stones that can be placed in the trough to slow them down even more. New feeders are on the market with large dimples in the bottom which has the same effect of slowing consumption. It also looks like it will reduce waste because there is less opportunity to take large mouthfuls, which contributes to spilling.
15. **Happy Horses :** Minimize stress. Keep horses in small groups; keep the groups the same. Horses are gregarious (they like each other's company). Once a pecking order is established, anxiety is created by moving them around. Anxiety can cause colic; this is what happens due to a change of housing. Some horses pair up and if they have to be separated, use sedation to minimize anxiety.

LUMPY SKIN : An Emerging transboundary disease

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Lumpy skin disease, first reported in Zambia in 1929 and the epidemic spread to neighbouring African countries and eventually reached the Middle East. (Tuppurainen and Oura, 2012) is an important infectious transboundary viral disease of cattle caused by Lumpy skin disease virus genus capripox of Family Poxviridae and this virus is antigenically closely related to goatpox and sheeppox viruses (OIE, 2010). This is economically devastating due to significant milk yield loss, infertility, abortion and death. Animal become infected via bite of blood-feeding arthropods including Hard ticks, biting flies and mosquitoes (Chihota et al., 2001), direct contact between infected and susceptible animal, drinking water and ingestion. Drinking is the most common mode of transmission. In Africa, African buffalo are regarded as maintenance hosts while Other wildlife species, however, may be involved (Radostits et al., 2007).

Animals that are clinically diseased are the most frequent cause of infection in healthy animals. However, the LSD virus can be found in blood, skin lesions, saliva, nasal discharge, lachrymal secretions, milk, sperm, and feeding and drinking troughs, all of which potentially be transmission sites (Abera et al., 2015).

The disease's morbidity is highest during wet, warm weather and drops throughout the dry season. Depending on the immunological condition of the hosts and the amount of mechanical arthropod vectors, the morbidity rate varies greatly. Morbidity of disease varies according to immune status of the animal and ranges from 3% to 85%.(OIE, 2008). Moreover, in natural epidemics, it can reach 100%, while the fatality rate seldom exceed 5% but can occasionally reach 40%.

The disease has incubation period of 2-4week. The virus causes febrile reaction due to viraemia and localizes in skin and regional lymph node causes development of inflammatory nodules in the skin and lymphadenopathy. There is lacrimation, nasal discharge, salivation and lameness. The skin lesion first appears on the skin In severe cases, due to vasculitis there is thrombosis. The skin lesion is seen first in perineum as round firm 1-4cm in diameter as grey-pink flattened circular painless nodules restricted to intradermal region. These nodules in later course of disease changes to caseous necrotic cores.

Epidemiology, clinical indicators, necropsy evidence, and laboratory interpretations can all be used to diagnose lumpy skin condition. Multiple skin nodules with limited areas of raised hair, nodules around nostrils, turbinate, mouth, vulva, and prepuce that can survive as hard lumps or become moist, necrotic, and slough are pathognomic nodular lesions. There is also leg oedema and superficial lymph node swelling.

Despite a preliminary clinical diagnosis of LSD, traditional PCR is used to confirm the diagnosis (Zheng et al., 2007) or real-time PCR techniques (Balinsky et al., 2008)

LSD is diagnosed during postmortem by examining for nodules on the skin, in the mouth, nostrils, vulva, and prepuce, as well as swelling of the superficial lymph nodes and systemic signs. Laboratory diagnosis of LSD can be made by transmission electro microscopic isolation and identification of the agent, Serological tests, routine histopathological examination and immune histological staining (Amenu et al., 2018).

There is no specific antiviral treatment available for LSD infected cattle. Sick animals may be removed from the herd and given supportive treatment consisting of local wound dressing to discourage fly from worry and prevent secondary infections.

Lumpy skin disease (LSD) is a monetarily devastating viral illness that affects cattle and is marked by distinctive nodular lesions mostly on the skin, lowering hide quality. In endemic areas, the mainstay of LSD control and prevention

is annual immunisation of cattle older than six months. Consequently calves born to immunized cows will have a six-month period of passive immunity. Also restriction of animal movements, isolation and slaughter of affected animals, proper disposal of carcasses, cleaning and disinfection of the premises and insect control are include control measures for LSD.

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POULTRY DISEASES IN INDIA: OVERVIEW

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INTRODUCTION

Poultry is the form of animal husbandry which raises domesticated birds such as chickens, ducks, turkeys and geese to produce meat or eggs for food. It has originated from the agricultural era. Poultry mainly chickens are farmed in great numbers. More than 60 billion chickens are killed for consumption annually.

DISEASES

Some of the diseases have the potential to decimate a region's poultry industry. When one of these diseases strikes, a quarantine or embargo could suddenly be placed on a region or nation. This could cause widespread economic hardship for both commercial and small flock owners. To protect the poultry industry-flock owners must be able to identify diseases to prevent them from spreading to other animals.

Diseases are spread by :

1. Direct contact
2. Indirect contact (contaminated equipment, people, environment)
3. Vectors (wild animals, rodents, insects)

In addition, reservoir of the disease, to persist in an area. This reservoir could be other birds or organic matter providing life support for these agents. Disrupting the methods by which diseases are spread can greatly reduce the threat to your flock.

POULTRY DISEASES

Some of the diseases have a greater effect in the bird population in comparison to other diseases. Most important disease are pullorum-typhoid disease, caused such concern that it prompted the creation of the National Poultry Improvement Plan. Active efforts by the NPIP to control this disease have proven very successful, and as a result, the disease has nearly been eradicated. However, pullorum-typhoid testing needs to be continued due to continued exposure from imported birds and other sources.

Pullorum-typhoid disease has been reduced significantly, other diseases still threaten today's poultry population. Two of these are avian influenza and Newcastle Disease (NCD).

AVIAN INFLUENZA

Avian influenza is a respiratory disease of poultry. Avian Influenza viruses can infect chickens and other birds like turkeys, pheasants, quail, ducks, geese, and guinea fowl etc. Migratory waterfowl seem to be a natural reservoir or host for Avian Influenza viruses. Type A influenza viruses are classified according to the severity of illness they cause. Avian Influenza viruses can be classified into low pathogenic and highly pathogenic based on the severity of the illness they cause in birds.

- **Low Pathogenic Avian Influenza (LPAI) :** Birds with LPAI may be appear healthy and without signs of sickness. However, LPAI can cause mild clinical signs, such as slight facial swelling and some respiratory symptoms. LPAI is monitored because two strains of LPAI-the H5 and H7 strains-can mutate into highly pathogenic forms.
- **Highly Pathogenic Avian Influenza (HPAI) :** This is a very infectious and fatal form of the disease that, once established, can spread rapidly from bird to bird or flock to flock. One gram (approximately one fourth of a sugar packet) of contaminated manure can contain enough virus to infect 1 million birds. HPAI typically causes severe illness with high death losses.

HPAI viruses can remain viable at moderate temperatures for several weeks in the environment and can survive indefinitely in frozen material. The virus can be killed by dehydration or sunlight.

CLINICAL SIGNS OF HIGHLY PATHOGENIC AVIAN INFLUENZA:

1. Sudden death without any clinical signs
2. Decreased egg production and/or soft-shelled or misshapen eggs
3. Swelling of the head, eyelids, comb, wattles, and legs
4. Purple discoloration of the wattles, combs, and legs
5. Nasal discharge, coughing, and sneezing
6. Lack of coordination
7. Diarrhea

HOW TO PREVENT OF AVIAN INFLUENZA :

1. House poultry indoors
2. Avoid the use of farm ponds and bird feeders
3. Avoid all contact with wild and domestic waterfowl
4. Avoid live bird markets
5. Control cats, rodents, beetles, insects, and other pests
6. Seek diagnostic help on unusual deaths
7. Avoid contact with your flock if working in poultry or swine processing
8. Try to avoid sharing equipment
9. If you share or borrow equipment, thoroughly clean and disinfect

NEWCASTLE DISEASE

Newcastle Disease (END) is a contagious and fatal viral disease that affects all bird species. It is one of the most infectious poultry diseases in the world. Newcastle Disease is so deadly that many birds die without showing any signs of disease. In un-vaccinated poultry flocks, a death rate of almost 100 per cent can occur, and Newcastle Disease can cause death even in vaccinated poultry.

SPREADS :

- Direct contact between healthy birds and the bodily discharges of infected birds
- Rapidly among birds kept in confinement, such as commercially raised chickens
- Through exposure to virus-bearing material picked up on shoes, clothing, equipment, and vehicles

CLINICAL SIGNS :

1. Sneezing, gasping for air, nasal discharge, coughing
2. Greenish, watery diarrhea
3. Depression, muscular tremors, drooping wings, twisting of head and neck, circling, and paralysis
4. Partial to complete drop in egg production
5. Production of thin-shelled eggs
6. Swelling of tissues around the eyes and in the neck
7. Sudden death and a high death rate in an infected flock

HOW TO PREVENT OF NEWCASTLE DISEASE :

1. Vaccination programs
2. Biosecurity practicing.

3. Avoid contact with pet birds that belong to others, game fowl and live bird markets.

PULLORUM-TYPHOID DISEASE

Chickens are especially susceptible to pullorum-typhoid disease. Both hens and roosters can carry the bacteria, an adult bird's joints may show signs of swelling, which is an indicator of possible pullorum-typhoid contamination.

SPREADS :

1. Transmitted from hen to young hatchlings directly through the egg.
2. Localized in the reproductive organs of a diseased female.
3. Also be transmitted through the digestive and respiratory secretions of infected birds.

CLINICAL SIGNS :

1. Swelling in joints of adult birds
2. Severe lesions on many of the internal organs
3. White pasty excrement (the disease was originally called bacillary white diarrhea)
4. The physical appearance of chicks and poults (drowsiness, lack of appetite, drooping wing, labored breathing, swelling in joints, and a stunted or distorted body appearance)
5. The high death rate in the first three weeks after hatching, sometimes approaching 100 percent of the brood

WHAT ARE THE IMPORTANT STEPS WHEN DISEASE OCCUR IN FLOCK

1. Separate the sick bird(s) from the rest of the flock.
2. Do not allow any person or equipment to come into contact with your flock or property until you can consult with a veterinarian.
3. Shower and disinfect your clothing and footwear after contact with the sick bird(s) or its environment; you will need to repeat these actions each time you have further contact with the sick bird(s).

2. Contact your veterinarian

When a bird shows signs of being ill, symptoms alone may not be enough to diagnose a particular disease since some diseases share similar symptoms. You should ask your local veterinarian to diagnose all unidentified illnesses.

RE-EMERGING SCRUB TYPHUS IN SUB-HIMALAYAN BELT

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The first report of scrub typhus in India has been since World War II from army barracks in Assam and West Bengal with further reports in 1965, during the Indo-Pak war. In 1978, first time, Jammu has been recognized as a scrub typhus prone region. However, later years, the disease virtually gets disappeared, probably because of widespread use of insecticides to control other vector-borne diseases, and has been lost from the radar of the scientific community of the country. The disease in the past has remained widely endemic in different parts of the country including the sub-Himalayan belt.

Scrub typhus is prevalent in the foothills of Himalayas viz. Jammu & Kashmir, Himachal Pradesh, Sikkim, Manipur, Nagaland, Mizoram, Meghalaya, Assam and West Bengal. It seems a resurgence/re-emergence of the disease in this sub-Himalayan belt may be attributed to changes in the human behavior e.g. unplanned urbanization, deforestation and rapid transport leading to displacement of vectors as well rodents from one place to another.

Scrub Typhus is a zoonotic infectious disease. The term scrub is used because of the type of vegetation (terrain between woods and clearings) that harbors the vector and the word typhus, a Greek word means ¡§fever with stupor or smoke. The disease is caused by an obligate intracellular pathogen, Orientia (formerly Rickettsia) tsutsugamushi. ¡§Tsutsuga¡¨ means small and dangerous and ¡§mushi¡¨ means insect or mite.

Scrub typhus is transmitted by the mite Leptotrombidium deliense (chiggers, Trombiculid mite). The vector mites inhabit areas where survival conditions prevail (mite islands) viz., the forest clearings, riverbanks, grassy regions, rice fields. However, it has also been identified in sandy beaches, mountain deserts and equatorial rain forests. Human beings are accidental hosts and are infected when they trespass into mite islands where bitten by the mite larvae (chiggers). The mite feeds on the serum of warm blooded animals only once during its cycle of development and adult mites do not feed on man. Scrub typhus occurs more frequently during the rainy season, usually from June to November. Mites are both the vector and the reservoir. Once they are infected in nature by feeding on the body fluid of the rodents

particularly wild rats of subgenus Rattus, field mouse, squirrels and bandicoot, maintain the infection throughout their life stages and as adults, pass the infection on to their eggs in a process called transovarial transmission.

Scrub typhus manifests clinically as a non-specific febrile illness often accompanying headache, myalgia, nausea, vomiting, diarrhea, cough or breathlessness. Severity varies from subclinical illness to severe illness with multiple organ system involvement which can be serious unless diagnosed early and treated. ¡§Eschar¡¨ at the site of attachment of the larval mite or chiggers the most characteristic feature of scrub typhus. It is a black necrotic lesion resembling a cigarette burn usually found in areas where skin is thin, moist or wrinkled. Cases of scrub typhus most frequently occur among farmers, forestry workers, and others involved in outdoor occupations. Human host in urban areas may get bitten by the disease-causing mite while jogging in parks, doing yoga or any other recreational activities such as camping in the jungles.

Severe complications from the disease include the acute respiratory distress syndrome (ARDS), shock, hepatitis, renal failure, meningoencephalitis, and myocarditis, in varying proportions of patients. Human to human transmission is absence in this zoonotic disease. The gold standard test for the serologic diagnosis of scrub typhus is the immune-fluorescence assay (IFA). However, while sensitive, the IFA is expensive, requires specialized labs and considerable training. Weil-Felix agglutination test are very insensitive and non-specific. Weil Felix test detects IgM antibody which is detectable 5-10 days following the onset of symptoms. The test results may be negative during the early stages of the disease because the agglutinating antibodies are detectable only during the second week of illness. Eschar samples can be used for conducting Polymerase Chain Reaction. ELISA and isolation of the organism are the other tests to diagnose the disease. Isolation is time consuming, tedious and requires a BSL3+ facility.

Scrub typhus is an easily treatable disease and deaths can be averted through use of antimicrobials. The recommended treatment for uncomplicated cases is Doxycycline or Chloramphenicol which is cost effective. In children, dosage of Chloramphenicol is used with caution. If treatment is not initiated, fever and other symptoms may persist for more than

three weeks. Azithromycin has been found to be effective in case of resistance to Doxycycline. However, cases must be suspected earlier based on clinical findings and a delay of more than two weeks may lead to severe form of the disease.

Prevention : Avoidance of Mite¡XHuman Contact

- Avoid mite infested areas
- Wear protective clothing

  Personal prophylaxis against the mite vector by impregnating clothes with miticidal chemicals (permethrin and benzyl benzoate) and the application of mite repellants (diethyl toluamide) to exposed skin surfaces.
- Eliminate mites from sites by application of chlorinated hydrocarbons (lindane, dieldrin and chlordane) to the ground and vegetation in camps and other populated zones in endemic areas.
- Chemoprophylaxis: Weekly once dose of 200 mg doxycycline is effective. It should be considered for non-immune people sent to work in endemic areas and in high-risk travelers.

Scrub typhus is a serious acute febrile illness associated with significant morbidity and mortality. A high index of suspicion is needed in patients presenting with fever especially during monsoon and post monsoon season. There is an urgent need for awareness generation among the medical and para-medical professionals especially at the peripheral levels. Due to paucity of resources in sub Himalayan belt, the cases of scrub typhus remain under-reported, especially in rural areas. Hence, it is recommended that standard treatment guidelines for timely diagnosis and treatment of Scrub typhus should be made available in rural areas which should be in accordance with the facilities available at sub-centers, PHCs, and CHCs. Active surveillance is required to be carried out to know exact magnitude and distribution of the disease.

Eschar; Most characteristic feature of scrub typhus.

SUMMER MANAGEMENT IN LAYER

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Abstract

In summer, as the temperature rises poultry suffer fromheat stress. It is a condition of imbalance between heat generation and heat loss from the body. Heat stress has deteriorateeffect on health, egg production and egg quality also. Although heat stress effects depend on genetics of breed, body weight, level of egg production, level of feed intake, feed quality, and over-crowding of birds in cage or house. When high environmental temperature coupled with high humidity is more vulnerable for poultry. Whenever, birds are exposed to prolong heat stress their body immunity hamperand chance of secondary pathogenic infection highly increased that, may cause high mortality, heavy production loss and deterioration in egg quality. Layer birdsadopt different activities to relieving from heat stress i.e. reduce their activity, try to move away from each other, reduce feed intake, increase water consumption, open their wings to half extended to provide more surface area for cooling, open mouth breathing with frequent respiration to reduce body heat by evaporative cooling i.e. panting, try to keep cool by dipping their comb and wattles in water. When the environmental temperature rises above ambient temperature there is need to take more caution to manage the flock.For maximizing production different practices may be adopted by poultry farmers like housing, feeding, water management, medication and light management.

Open house system

Keywords-: Heat stress, heat stress symptoms, management, Heat stress effects, Panting, Layer birds

In India poultry has shifted from unorganized sector to organized scientific poultry farming. Commercially, most of thelayer birds are reared in conventional cages in open house system. The housing system is essentialfor survival of birds from adverse climatic effects.Extreme climate condition has unpropitious effect on livestockas well as on poultry.Poultry are more susceptible to high ambient temperature during summerin comparison to other livestock because birds don't have sweat glands like mammals.Thermo-neutral zone for poultry varies between 220C - 260C. However,birds try to regulate their body temperature by losing heat from body. Birds dissipate their body heat to maintain thermo-neutral temperatureby four different mechanismsi.e., 1. Convection mean body heat lost direct in surrounding air.Poultry may increase exposed surface area by drooping and spreading wings. 2. Radiation mean transfer of body heat to a distant cooler objects(i.e. walls, ceiling, equipment). 3. Evaporative Cooling mean rapid, shallow, open-mouth breathing for increases heat loss direct from mouth and respiratory tract i.e. panting. During panting bird lost approximately, 540 calories energyper gram of water by the lung. 4. Conduction means body heat loss with direct contact to cooler objects.

In summer, environmental temperature varies from 300C to 450 C in most of the areas in tropical country like India. As the temperature raise above the ambient temperature layer feel discomfort and highly effect on egg production although heat generation depend on genetic of breed, body weight, level of egg production, level of feed intake, feed quality, and over-crowding of birds in cage or house.Poultry feel dis-comfort whenever,heat generation is higher than the heat loss. When high environmental temperature coupled with high humidity is highly vulnerable for poultry health, productionand egg quality also. Heat stress is a condition of imbalance between heat generation and heat loss from the body.For maintaining the internal environment of shed,different practices can be adopted by poultry farmers like housing, feeding, water management, medication and light management. There is highly essential to manage poultry in summer so that heat stress can avoid.

Effects of heat stress in layer :

Heat stress have direct effect onfeed intake, growth rate, body weight, reproductive performance and egg production & egg quality in layer birds. Feed intake will reduce by 1.2% for each one-degree centigrade rise in the temperature from 220C-320Cand 5% for each one-degree centigrade rise in the temperature range of 320C -380C. Water intake will increase by 7% for every degree rise in temperature above than 210C.

Whenever, birds are exposed to prolong heat stresstheir body immunity became down than chance of secondary pathogenic infection highly increased which, may cause high mortality, heavy production loss and deterioration in egg quality. Layer are adopted different ways to relieving from heat stressi.e. reduce heat generating activity, try to move away from each other, reduce their feed intake, increase water intake, open their wings to half extended to provide more surface area for cooling, open mouth breathing with frequent respiration to reduce body heat by evaporative cooling i.e. panting, try to keep cool by dipping their comb and wattles in water.When the environmental temperature rises above ambient temperature there is need to take more cause to manage the flock.

Summer management in layer

A) Housing management
B) Water management
C) Feeding management
D) Light management
E) Medications
F) Some other practices

A) Housing management

Roof management

1. White wash on roof tops.


Poultry house roof and thatching material

2. Roof top cover with agro-waste or thatched material.
3. Arrange sprinklers on roof.
4. Provide 4-6 feed roof over hanged to protect from direct sunlight.
5. Provide ridge ventilation to removal of hot air.

Shed management

1. Installation of fogger for the reducing the temperature inside the shed.
2. Installation of 36 inch 1/2 hp horizontal fans in every 500-600 sq ftat 60 degree angle to increase air circulation inside shed.
3. Foggers and fans should be collectively operated according to the humidity inside shed. Only fan should be used when humidity is high. If possible fogger should be used with timers in 1:3 ratio. We can also on fogger for 2 minutes in every 10 minutes manually.
4. Clean all spider webs and dust from wire net to increase air flow.
5. Install jute curtains in both side of shed longitudinally with pipeline by which wetting of curtains to protect birds from direct hot air.
6. Maintain litter in good condition and remove cake frequently to prevent the moisture and ammonia build-up in deep litter system.
7. Reduce over stocking of birds in cages and provide more floor space in deep litter also.

B) Water management

Water management is the most critical parameter because feed consumption depending on water consumption. In summer when temperature reaches above 30 degree centigrade, water consumption becomes 3-4 times more than normal. So its utmost requirement to provide plenty cool and clean water during summer.

1. Use nipple drinkers to provide clean water
2. Flushing of water tank and pipe line 2-3 times in a day during peak summer to provide cool water.
3. Cover-up the water sources and pipe line with gunny bag or other materials to protect from direct sunlight.
4. If possible then keep the water tank inside the shed to ovoid direct exposer from sunlight.
5. In cage system with water pipeline install water channel to provide plenty of water during summer.
6. Provide extra drinkers in deep litter.
7. Ensure water testing time to time to provide clean and good quality water.
8. Ensure cleaning of pipeline on regular basis for removal of biofilm.

9. Use ice cubes in water tank to provide always cool water in summer.

C) Feeding management

Feeding management can be divided in three parts-

- Feed form
- Feed nutrition
- Feeding time

Feed form

1. Providecrumb feed (1.5 to 2mm size) in summer because in consumption of crumb feed less energy expend as compare to mash feed.
2. In layer chicks brooding broiler starter can be provided for first 10 days to overcome the bodyweight loss in summer.
3. Pellet feed is helpful in summer as compare to mash feed.

Feed nutrition

1. High energy diet should be given in summer because birds have more energy losses during panting.
2. Energy in feed should be supplemented with oil rather than grain because fat has lowest heat increment value in comparison with carbohydrate and protein.
3. Feed consumption is reduced in summer, to overcome nutritional and productive losses we should supplemented with 20-30 percent more amino acids, vitamins and minerals rather than increasing direct protein level.
4. Increase calcium and phosphorus level in feed to overcome thin shell eggs more often coming in summer due to respiratory alkalosis (More co2 losses during panting in summer).

Feeding time

1. Feed should be provided in cooler part of the day i.e. early morning and late evening.
2. 70-80 percent feed should be provided in early morning and remaining part in late evening.
3. Feed stirring should be avoided in hottest part of the day i.e. after 12 pm to 6 pm.
4. Ensure withdraw of feed before 3-4 hours of anticipated hottest period of the day to reducing heat stroke mortality due to body heat generated after digestion of feed.
5. Increasing feeding frequency may help to combat heat stress effect due to feed consumption.

D) Lighting management

1. Normally, we provide 16 hours day length in layers for optimum productivity of birds.
2. Birds reduce feed consumption in summer specially, during hottest part of the day so we have to adjust light timing by which birds get more cooling hours for feeding.
3. In summer we should provide early morning light 4 am to late evening 8 pm.
4. Midnight lighting of 1-2 hours may help to overcome reduced feed consumption in summer by which we will be able to maintain target bodyweight for achieving better performances.

E) Medication

1. Use Sodium bicarbonate in feed @1-2 kg / tonne feed in summer because more carbonate ions loss during panting as carbon dioxide results in reduce eggshell quality as shell made up of calcium carbonate. $NaHCO_3$ (Meetha soda) help to improve egg shell quality.
2. Use electrolytesin feed for maintaining acid -base balance.
3. Potassium chloride (KCl), Ammonium chloride (NH_4Cl) through feed may also help to restore losses of ions.

4. Anti-stress vitamins like Vitamin C@ 150 mg /kg help in heat stress.
5. Antioxidant Vitamin E @ 125 mg/kg.
6. We can use Chromium supplementing products may help in heat stress.
7. Aspirin powder @ 0.3 gm /lit water.

F) Some other practices

1. Plantation without branches plants or greenery around the shed helps in controlling shed temperature in thermo-neutral zone.
2. We should not disturb birds during hottest part of the day.
3. Other activities like vaccination, Handling, Shifting, de-beaking, should be carried out in cooler part of the day.

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MASTITIS METRITIS AGALACTIA IN SWINE

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Introduction

Swine agalactia (formerly known as MMA or mastitis, metritis, agalactia) is a disease syndrome that causes baby pigs to starve to death and increases their vulnerability to other fatal neonatal disorders. Because of its economic significance, this illness is extremely important to pig producers. The classic swine agalactia condition manifests itself in the early stages of breastfeeding. A complete loss of milk (agalactia) is less common than a decline in typical milk quantities (hypogalactia). The latter is often overlooked, and the belief that the baby pigs were born feeble is frequently accepted as fact.During a farrowing cycle, the number of sows or gilts affected by this illness syndrome in a given herd can range from 0 to 100%, with an average of 13.1 percent.

Causes

The illness complex might occur as early as farrowing or as late as several days following parturition. Bacterial invasion of the udder and subsequent development of endotoxins are the most common causes (the cell wall lipopolysaccharide produced by bacteria like E. coli). However, endotoxin cannot always be detected in infected animals' plasma, and bacteria or mastitis cannot always be detected in the mammary glands. In these circumstances, endotoxin could come from bacteria in the gut or endometritis (uterine infection). Hormonal factors have also been mentioned as a possible cause. Following parturition, a number of hormones may be depleted. Insulin, cortisone, and prolactin, as well as oxytocin, oestrogen, and progesterone, are hormones involved in breastfeeding, and alterations in their levels have been observed in pigs with agalactia. Oxytocin levels in these sows are frequently half of what they are in normal sows. Small amounts of endotoxin can drastically reduce prolactin levels, and inhibiting prostaglandin F2 alpha formation in the uterus (perhaps due to infection) might also reduce prolactin output. Less exercise, overfeeding, and poor hygiene all appear to predispose to the syndrome, and management and nutrition appear to be key in the aetiology.

Clinical signs

Within 12 hours to three days of parturition, the condition frequently develops. Inappetence is the most common symptom, followed by depression, restlessness when being suckled, and litter loss of condition. If mastitis is present, affected sows may have a mild temperature of 39.5-41□C. Only a single gland is mastitic in many situations. This disorder is commonly accompanied with vulval discharge and constipation, but none of these symptoms may be present. The illness lasts at least three days before it goes away on its own. It's possible that the litter has vanished by this point. Delays in parturition (>5 hours) may precede the disorder, which might vary in severity.Depressed daily live weight growth in piglets (105 g/day, normal 125 g/day) may be the primary indicator of the problem in moderate cases of hypogalactia without mastitis or other aspects of the complex.Clinical symptoms, particularly inappetence in the sow and a drop in litter condition, are used to make the diagnosis. Diarrhoea, septicemia, or hypothermia can cause decreased milk intake and thus the litter should be inspected. A fever could be a sign of another illness (e.g. erysipelas).Retention of a foetus or placentae can be indicated by difficulty farrowing, tiny litters, or incomplete cleansing. Rapid respiration, a gloomy attitude, a lack of desire to eat or drink, fever, and a reluctance to move or enable nursing are some of the signs or symptoms noted in the sow or gilt. When newborn piglets appear to be in distress, it's time to take a closer look at the sow. The sow or gilt's mammary glands are more commonly implicated than any other body part. The amount of glands involved varies from one to the entire udder. When compared to the other glands, the

affected mammary glands are frequently larger, firmer, warmer, more sensitive, and discoloured. The appearance of a purulent discharge (pus) from the birth canal does not always imply metritis in the sow or gilt. According to studies, more than 60% of clinically normal sows have a discharge. Lactation failure (agalactia) can occur as a primary condition or as a complication of another illness. The mammary gland tissues of the majority of affected animals will be aberrant. The basic mammogens-estrogens, progesterone, and prolactin-along with a variety of direct and indirect synergistic hormones-are required for the mammary glands to fully grow and secrete milk. To initiate and maintain lactation, each of these hormones must be present at the proper time and in the right amount. Anything that alters hormone levels, such as environmental stress, poor nutrition, bacterial endotoxins, or inappropriate preventative shots, can have an impact on lactation. All or all of the elements can play a role as contributors or stressors in the development of mastitis, the presence of enough endotoxin, or an endocrine (hormonal) imbalance that prevents proper mammary gland activity. Although it is unknown whether heredity plays a part in this disease, stress-sensitive and stress-resistant lines have been found, with susceptible lines having more agalactia issues than stress-resistant lines.

Treatment

Affected sows can be given tiny amounts of oxytocin on a daily basis, but this is not necessary if they are frequently suckled. When mastitis, metritis, or fever are present, antimicrobial treatment is recommended. Ampicillin, tetracyclines, trimethoprim sulphonamide, or enrofloxacin are some of the antibiotics that can be used. Anti-inflammatory medications like flunixinmeglumine or corticosteroids can help to heal faster. Piglets should be fed artificially until the sow recovers, either through a stomach tube or by sucking another sow.When the sow's body temperature reaches 39.4□C, treatment should begin 12-18 hours after farrowing. Feeding trimethoprim: sulphonamide at 15 mg/kg body weight or tetracyclines from day 112 of pregnancy to day 1 postpartum significantly reduces the disease's occurrence. Injections of long-acting tetracycline administered one day before farrowing may be advantageous. Farrowing early as a result of prostaglandin use; hygiene; exercise of sows prior to farrowing and during the early stages of lactation; reduction of feed intake to 1 kg/day from 100 days' gestation; and use of vegetable protein are all practises that appear to reduce the incidence or severity of the condition.

Conclusion

Mastitis, metritis, and agalactia (MMA) syndrome is a widespread pig disease with numerous etiologies that causes significant economic loss and high piglet mortality. E. coli, Streptococci sp, Staphylococci sp, and other infectious organisms are involved. Lack of exercise, endocrine variables, and toxic factors all have a role in the disease's development. Anorexia, restlessness, inattentiveness to the piglets, fever, agalactia, and swelling of the mammary glands are among symptoms that appear between 12 and 48 hours after farrowing. Management of MMA can be solved by paying close attention to sanitation, as well as the sow's exercise, nutrition, and bodily condition.Also, treatment can be done by use of antimicrobials, anti-inflammatory medications and other supportive care.

ALTERNATIVE APPROACH IN THE MANAGEMENT OF BOVINE MASTITIS

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Introduction

Mastitis is multi-etiological disease complex of dairy animals that is characterized by physical, chemical and usually bacteriological changes in milk and pathological changes in glandular tissues (Radostits et al., 2000). High milk producing especially cross-bred cows are most prone to mastitis and prevalence range from 5 to 37 % (Bangar et al., 2016). Certain epidemiological studies report more than 90% prevalence of sub-clinical mastitis in high yielder cross bred dairy cows (Sharma, N., 2003). Both clinical and subclinical mastitis causes huge loss of milk production apart from the cost of treatment and other expenses. Besides, various studies revealed that both clinical and sub-clinical mastitis affect the reproductive efficiency of animals at several levels. Antimicrobials are extensively used as an integral part of mastitis treatment and management program.

The antimicrobial therapy helps in minimizing the losses and recovery. However, despite the wide spread use of these drugs, antimicrobial treatment of mastitis has been found to be less effective than desirable; the problem in dairy animals continued to pose great challenge. Factors like pharmacokinetic problems, phagocytosis depressing effect of certain antibiotics, drug resistance and appearance of residue in milk restricts the success of antibiotic therapy. There has been growing consensus to focus on alternative approach for enhancing immunity and udder health. A variety of non-antibiotic, non-proprietary agents have demonstrated promising effects in the treatment & prevention of mastitis in dairy animals.

Trisodium citrate

It's proven that citrate play vital role in milk synthesis and certain level of citrate is essential for lactogenesis in each alveolus in the udder. Although, many investigators reported that citrate content in milk vary during lactation, the level is around 130-160mg /100 ml of milk in cow and goat milk, which can go as high as 46 times around parturition. This elucidates its importance in milk synthesis and also, it's likely association with mastitis in dairy animals. Further, it is frequently observed that citrate is significantly low in milk of mastitis infected animals, particularly it is very low in milk of mastitis affected quarters of udder (33.71mg/ 100ml).

It is well known that milk quality is diminished in clinical as well as in sub-clinical mastitis. As certain minimal citrate is required by each alveolus for synthesis of milk, the udder quarters affected with mastitis result in faulty synthesis of milk, which is mainly due to inconsistency in the citrate content The citrate deficiency in the particular affected quarter may be due to metabolic factors, nutritional or some other intrinsic factors.

The pH of udder of dairy animals is critical for optimal lactogenesis, to carry out important physiological processes. Citrate is the main constituent of the buffer system responsible for the maintenance of pH (~6.50) in the udder and regulates the homeostasis between Ca and H ions which maintains fluidity of milk. Further, changes in pH, usually high pH is conducive for invasion and proliferation of pathogens, and thus implicated into sub-clinical or clinical mastitis. As alteration of pH and thus compromised udder physiology led to clumping of Ca ions which manifest as flakes in the mastitic milk. These flakes of Ca ions likely injure the parenchymatous tissue in the udder alveoli that aggravate the inflammatory reaction and damage udder tissues. Optimum level of citrates may prevent clumping of Ca ions and thus can moderate the tissue injury in the udder.

Oral administration of citrate as feed supplement, mostly in the form of Trisodium citrate proved to be very beneficial, cost-effective approach for prevention and control of mastitis (Rai et al., 2013). Feeding citrate orally to the mastitic animals led to an increase in milk citrate levels and helped in improving clinical condition of animals (Renu et al., 2016). It is also reported that Tri-sodium citrate administration improve milk quality and increase fat, S.N.F, Protein and milk yield over the respective values in mastitic milk (Prakash et al., 2013).

Vitamins

During transition period, dairy cows and buffaloes are likely to be in negative energy balance, which correlate with higher

risk of ketosis. Further, clinical ketosis is associated with a two-fold increase in the risk of clinical mastitis. Thus, during transition period, and especially after calving, availability of vitamin E, Vitamin A, Vitamin C and Vitamin- H can improve udder health and helps in prevention and control of mastitis.

Vitamin E is known potent biological antioxidant and a free radical scavenger. Considering this, vitamin E also perform important functions in various systems namely, muscular, nervous, circulatory, reproductive and immune system. Certain studies demonstrated that cows with low plasma vitamin E levels before calving are 9 times more prone to clinical mastitis compared to acceptable blood levels. NRC (2001) recommends higher dietary vitamin E levels for transition and lactating cows to maintain the minimum plasma vitamin E concentration for optimum immune response. Such replenishment of blood levels could boost phagocytic neutrophil reactions for control of pathogenic invading microbes in the udder.

Vitamin A is known for its anti-infective role and thus protect animals against numerous infections, including mastitis. Low concentrations of plasma vitamin A (<80 ?g/100 ml) and ?-carotene (<200 ?g/100 ml) are associated with severity of mastitis. These can exert a stabilizing effect on polymorphonuclear neutrophils and lymphocyte function in the udder. Vitamin A or B-carotene supplementation of dairy cows may improve mammary gland host defense and may have some positive effects on mammary gland health.

Vitamin C is involved in a number of biochemical processes (oxido-reduction). It stimulates phagocytic activity of leukocytes, function of the reticuloendothelial system and formation of antibodies. In clinical & sub clinical mastitis, serum level of ascorbic acid (Vit. C) is significantly reduced (Ranjan et al., 2005). It has been suggested that clinical severity of mastitis is directly associated with reduced vitamin C levels. Dietary vitamin C reduced the milk somatic cell count; also provided some potential benefit for recovery from acute mammary inflammation in dairy cattle. Vitamin C is found to be helpful in healing of tissues from injury by contributing the synthesis of collagen through hydroxylation, which depends on ascorbate-dependent enzyme required for recovery. In addition, Vit C has immuno-modulatory and anti-oxidant effects which may also play vital role in recovery process.

Vitamin H or Biotin is specially required for production of keratin and the epidermal tissues of hoof-horn. It may also involve in the keratin synthesis and integrity of teat canal of udder of dairy animals and can play important role in prevention of invasion by pathogens and thus prevention of mastitis. Biotin also has other important metabolic effects that could influence milk production, as it acts as cofactor of three different enzymes needed for synthesis of glucose and one required for synthesis of fatty acids. The multiple research reports show that biotin supplementation can improve lactation performance. Biotin supplementation at 10 mg/d increased milk yield by 1.5 kg per cow (Bonomi et al.1996).

Vitamin D: Higher levels of Vitamin D is required for proper immune function. It is reported that significant reduction occurs in bacterial counts and fewer clinical signs of severe infection in cows treated with vitamin D, compared to cows that received no treatment. In the early stage of the infection, as vitamin D reduced the bacterial counts, milk production was also greater in the treated animals.

Trace minerals

Trace minerals especially, Zinc and Selenium preferentially supplemented for the management of subclinical and clinical mastitis. The multiple properties and roles of these essential trace elements, directly and indirectly involved in stimulation and building strong immunity and restoration of physiology of the udder, prevent post-parturient complications like retention of placental membranes, pyometra, metritis and most importantly, prevention and control of mastitis.

Zinc plays vital role in many important body functions of dairy animals which include cell growth and replication, bone formation, skin integrity, cell- mediated immunity, and generalized host defense (Gropper et al. 2005). Zinc is crucial in various cellular processes through involvement in gene expression and cellular growth. Zinc is necessary to maintain the integrity of the keratin that lines the streak canal and also its Supplementation reduce somatic cell count up to 33% (Suan and Robert, 2009). Further, Tomlinson et al. (2002) reported the significant reduction of SCC to 196,000 vs. 294,000, when Zinc was supplemented between 200 and 380 mg/day. Zinc is proven immunity stimulant or enhancer as its deficiency likely led to reduced formation of both T and B lymphocytes and phagocytes (Sherman, 1992).

Selenium is essential for many body functions, as a component of more than 30 selenoproteins. These selenoproteins protect tissues from damage inflicted by unstable free radicals, which can cause many chronic diseases, including chronic mastitis and udder fibrosis. Besides this, selenoproteins perform key role in thyroid hormones metabolism, control of reproductive functions and exert neuroprotective effects. In addition to its anti-proliferative and anti-inflamma-

tory properties, selenium stimulates the immune system. The role of selenium is aided by vitamin E and sulfur-containing amino acids. Selenium and vitamin E facilitate neutrophil migration to the mammary gland, and they enhance the bactericidal effects of neutrophils, thus shortening and alleviating the symptoms of clinical mastitis.

Copper is another important micro-mineral that confers robust antioxidant properties. It is the key component of super oxide dismutase (SOD) and ceruloplasmin and thus exerts beneficial effect in mastitis treatment and control. It has been reported that supplementation with Cu alleviated the severity of clinical signs in coliform mastitis (Scaletti et al., 2003).

Serratiopeptidase is a proteolytic enzyme that reduces edema, stimulates immunity, and has anti-inflammatory action. It can increase bio-availability of anti-microbals at infection sire, act as an inhibitor of biofilm formation and thus can help to counteract the resistance to anti-microbials.

Therefore, supplementation of zinc, selenium and Serratiopeptidase can certainly help to repair tissue damage caused by physical injury or inflicted by invading pathogens in the udder.

Potent Herbs

Many herbal ingredients or extracts claim to be beneficial in prevention and treatment of mastitis in dairy cows and buffaloes. Medicinal plants with their well-established effect are an excellent natural product resource used as an alternative therapy. Some of such plants or herbs are Curcuma longa, Boswellia serreta, Piper nigrum, Withania Somnifera, etc.

Curcuma longa is rich in dietary fiber, iron, potassium, magnesium and vitamin B6. Curcumin present in it, can reduce swelling, pain and inflammation. Its therapeutic properties are well proven, mostly its immunity boosting and anti-oxidant properties. Apart from this, it act as natural antiseptic and has antibacterial, antifungal, anti-inflammatory, antiallergic and wound healing properties. Hence feeding turmeric can prevent the incidence of mastitis in dairy animals.

Boswellia serreta has potent antiinflammatory, antiarthritic, and analgesic properties. These potent properties can certainly help for prevention and or for early recovery from the painful mastitis in dairy animals.

Piper nigrum which is commonly called as black pepper, is high in antioxidants and also has anti-inflammatory properties. It is proven that, in mastitis, free radicals damage alveolar cells and aggravate inflammatory reaction in the udder of dairy animals. Potent antioxidants herbs are very essential to prevent or recover from mastitis and also beneficial in building immunity against the invading pathogens.

Withania somnifera, commonly known as Ashwagandha or Indian ginseng. It is an important commercial medicinal crop and its various parts are used in traditional medicine for the treatment of various ailments. Among the many, its important properties include, immunomodulatory, anti-inflammatory, anti-stress, anti-microbial, antioxidant, etc.

Conclusion :

Therapeutic intervention is an integral part of a control program for bovine mastitis. Treatment regimen of mastitis should be aimed at eliminating invading pathogens or assist host defense mechanism to combat with the infection and to minimize the pathological consequences of infection. Few non-proprietary ingredients are found to be beneficial in the control and prevention of mastitis. Many studies reveal that citrate is playing a vital role in milk synthesis and it is the main constituent of the buffer system responsible for the maintenance of pH in the udder. Citrate levels are found to be very low in milk of quarters affected with mastitis. Deficiency of citrate in udder leads to the clumping of Ca ions; the flakes of Ca ions also cause injury to udder alveoli. Bringing the pH to acidic creates unfavourable environment for the growth of mastitis pathogens; also render antibiotics more effective. Trisodium citrate helps to reduce the milk pH and thereby helps in clearance of udder infection. Vitamin E supplements in dairy cows boost immune response and enhance the neutrophil function. Vitamin E combined with selenium, acts as anti-oxidant by preventing oxidative stress. Vitamin A & H contributes mucosal surface integrity of the mammary gland. Vitamin C helps in faster recovery from injury by contributing the synthesis of collagen through hydroxylation. Zinc and copper are important nutritional elements that contribute mammary gland health by promoting cellular repair, wound healing and reduction in SCC aided by increasing metallothionein synthesis with antioxidant potential. Some of the herbal ingredients also possess immunomodulating & tissue healing effect to fight against mammy gland infection. Therefore, supplementation of Trisodium citrate combined with Vitamin A, E, C, H, essential micro-minerals like Zn & Cu and potent herbs results in significant reduction of mastitis, decrease in milk pH, quarter based infection, milk somatic cell counts and increment in milk quality and quantity.

FARMER'S BLACK GOLD

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Introduction

Buffalo production plays a significant role in food security and poverty alleviation in Asian countries. Buffaloes, described as the ''Black Gold'', are favourite multipurpose animals of farmers and are in fact the ''bank on hooves'' with huge potential for social and economic changes for the agrarian community. Buffalo has been an integral part of livestock agriculture in Asia for over 5000 years producing milk, meat, hides and draft power. With more than 90% of global buffalo population present in Asia, 77.9% buffaloes are inhabitant of south Asian countries. India is home for 57% world buffalo population and contributing nearly 50% of total milk production of the country. Data from the 20th livestock census shows that the buffalo population has grown by 1.06 per cent between 2012- 2019. With 20 per cent share of world's bovine population, India is one of the largest producers and exporters of buffalo meat. India has exported 1.086 million tonnes of buffalo meat products to the world for the worth of Rs. 23,460.38 Crores/ 3,171.19 USD Millions during the year of 2020-21. During the last 70 years, buffalo contribution of nearly 50 per cent in milk pool elevated India to the No. 1 pedestal in total milk production, while buffalo meat export earned India another distinction of being the largest buffalo meat exporting country in the world. Buffalo meat also surpassed basmati rice as the largest exported agricultural commodity during the year 2016-17.

About Buffalo Milk : Status And Contribution

Livestock sector is growing faster than any other agricultural sub-sector. While percentage contribution of agriculture and allied sector at constant prices (2011-12) in total gross value added (GVA) decreased from 18.5 to 14.8 per cent from 2011-12 to 2019-20; the share of livestock to total GVA increased from 4.0 to 4.4 per cent. Buffalo is prominent in UP, Rajasthan, Gujarat, MP, Bihar, AP, Maharashtra, Haryana, Telangana and Punjab, where it contributes between 54-85 percent to total milk produced and is important contributor to rural household incomes.

In India Buffalo Current Population

The total milk production of India was about 165 M tonnes in 2016-17, with buffalo share of over 49%. For the year 2019-20, the total milk production was estimated at 198.4 M tonnes. The productivity of buffalo is highest in Haryana followed by Punjab. Uttar Pradesh, having about 26% of total in-milk female buffaloes, is having per animal productivity of 4.44 litres per day (about 50% of the best producing state). There is scope for further improvement in buffalo productivity through improved germplasm dissemination, nutrient availability and health care.

Leading states with buffaloes (Million heads) (20th Livestock census-2019) Uttar Pradesh (33.016), Rajasthan (13.693), Gujarat (10.543), Madhya Pradesh (10.380), Bihar (7.719), Andhra Pradesh (6.219) Maharashtra (5.603) Haryana (4.368) Telangana (4.226) Punjab (4.015)

Buffalo Milk Production

Buffalo milk is rich in protein, fat, conjugated fatty acids (CLA), and minerals with low cholesterol, sodium and chloride. It has double lactoperoxidase activity, more thermally stable ?- lactoglobulin, larger fat globules size (4.16-4.6 ?m), higher buffering capacity (25-30% more) and more Vitamin A, E and B12 (4 folds more). Buffalo milk is not only sweeter in taste but also more creamier and thicker with more solids, hence preferred for preparation of several traditional sweets. Buffalo milk is extra source of nutrients Water (820 g/L), Total solids (172 g/L), Lactose (5-5.5%), Protein (4-5%), Fat (6-9.5%), Cholesterol (0.65 mg/g), Conj. Linoleic Acid (6.1 mg/g fat).

About Buffalo Meat

Meat production from buffaloes contributes immensely to Indian economy and plays a pivotal role in sustainable buffalo husbandry through improvement in productivity, remunerative price for the culled/ unproductive stocks, prevention of degradation of soil and water resources and reduction in the greenhouse gas effect. Resultantly, there are no stray buffaloes on the streets. The total meat production ofthe country was 8.6 million tonnes in 2019-20 with a steady increase from 7.4 million tonnes since 2016- 17. Buffalo contribute 22% of total meat production of the country (2019-20) and UP, Maharashtra, AP and Telangana are the largest producers of buffalo meat (2018-19).

Meat production in India

India is the leader in buffalo meat production with an export of 1.086 million tonnes of buffalo meat (APEDA, 2021; https://agriexchange.apeda.gov.in/indexp/exportstatement.aspx) worth of Rs. 23460.38 crore (2020-21). Presently, there are 68 modern abattoirs with meat processing facilities approved by APEDA for export of buffalo meat from the country. According to the All India Meat and Livestock Exporters Association (AIMLEA) export abattoirscum- meat processing plants in India registered with the export regulatory authority (APEDA) are employing74,000 workforce directly and 1,50,000 indirectly. Slaughter restrictions on utilization of male buffalo calves and other unproductive buffaloes need to be relooked for increasing revenues from buffalo meat.FMD control programme needs to be implemented effectively for control / eradication of this important economic disease, which will enhance the market potential of both milk and meat across the globe for attracting better prices.

Utilization of slaughterhouse by-products and value addition

When meat animal is slaughtered and processed, only one third is meat and the rest comprises of by-products and waste which are used as variety of meat for human consumption, pet foods, industrial products and organic fertilizers.Value addition of slaughterhouse by-products for pet food viz. sausages, nuggets from blood and rumen pickles/ flakes, earlobe, intestines, dried offals, tendons could be prepared to fill the gap of demand for pet food in the country. Dry/ semi moist pet food from buffalo offals could also be prepared to generate income. Rendering converts highly perishable meat by-products that are unfit for human consumption into useful commodities such as meat meal, bone meal, meat and bone meal, pet food along with additional quantities of fats, tallow and greases used in various feed and industrial sectors. Rumen and intestinal contents as well as remaining unusable wastes are fed into bio-digestors for production of bio-gas and manure.

Major buffalo by-products and their uses

Primary by-product	Secondary by-products
Hide / skin	Leather, collagen sheets, Glue
Edible offal - lung, liver, spleen, stomach, etc	Variety meat for human consumption
Inedible /condemned offal	Pet foods , meat meal, tallow
Bones	Bone meal, gelatin
Blood	Blood meal, albumin, haemoglobin, serum, plasma, fibrin
Intestine guts	Sausage casings, instrument strings, surgical sutures, tennis racket
Horns	Keratin, artifacts, buttons
Hoofs	Keratin, hoof meal, neat's foot oil
Intestinal contents	Manure
Pancreas	Insulin
Lung Heparin	
Liver Liver extract	

Fat Tallow - Soap industry, textile industry

Buffalo slaughter regulations need to be pragmatic and dynamic to the changing situations so that sustainability of the species could be achieved.The existing bans/restrictions on buffalo slaughter in place since 1970s in some states, need to be relooked in view of changes in land utilization pattern, buffalo production scenario, economic pressures, feed and fodder availability, importance of productivity etc., which demand a pragmatic approach for making modification to the

existing provisions. With decreasing role of draught animals for providing farm power, rearing male buffalo calves with backward integration for meat purpose seem to be the appropriate alternative to contribute for the total productivity of buffaloes for sustained production. Issues for enhancing buffalo economy in India:

- Breeding strategies: It should be based on the resource position of farmers, which is by and large, poor.
- Ensuring clean production system of meat and milk: For promoting exports and also for domestic consumers.
- Enhancing value addition, processing and market linkage: Preventing wastage of products due to contamination, unfair trade practices and elimination of intermediate agencies in marketing will further enhance the profit margins (presently only 30% milk is sold through the organised sector).
- Augmenting buffalo reproduction: Buffalo should calve once in every 12-16 months. For this, she must be pregnant by 65 days after calving and for this, breeding should start at 40 days after parturition. Estrus detection is frustrating problem in buffaloes leading to more incidence of repeat breeding.
- Policies and funding for solving the issues in buffalo reproduction, dissemination of superior germplasm, disease control and marketing need to be looked into.

Conclusion

Buffalo are good grazers; as compared to cattle they graze a wider range of plants. They have a larger rumen, slower rumen movements, rate of outflow from the rumen, and higher bacterial activity capable of utilizing low grade roughages. They are capable of round-the-year breeding with good nutrition and care. The production of fat-corrected milk matches favourably with any high yielding cattle breed. Absence of religious taboo on buffalo slaughter, helps scavenge the value for spent animals as well, making buffalo farming more remunerative. Buffalo will continue to contribute in Indian agricultural economy for livelihood, food and nutritional security. Full potential of buffalo needs to be explored for sustainable gain in Indian economy.

CARBON FOOTPRINT OF DAIRY FARMING

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Abstract

Greenhouse gas (GHG) emissions and their potential effect on the environment has become an important global issue. Dairy production is a well recognized source of GHG emissions, but very limted is known about the net emissions from dairy enterprises. The main objective of this is to elucidate the carbon footprint of dairy farms and the potential sources leading to increased GHG emissions hence the carbon footprint. Various methods of estimating carbon footprint of dairy production has been focused .

Key words : Carbon footprint , LCA , GHGs sources, enteric methane, N2O ,carbon footprint estimation

Introduction

The increasing concentration of greenhouse gases in the atmosphere is leading to the phenomenon of climate change which is a major concern of the entire world today. Carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O) are the major greenhouse gases contributed by anthropogenic sources. It is the activity of incoming and outgoing GHGs which are leading to the warming and cooling of the surface of the earth respectively. Although increasing GHG production has been posing threat to life in the universe, their absence would bring down the average temperature of the earth's surface to about -18□c (Qiancheng,1998).

Therefore, for the survival of life on earth, the heating effect is vital. However, it is the rapid increase in the concentration of these gases which are causing the impact of climate change and also global warming. Atmospheric methane (CH4) has been recognized as the second most important greenhouse gas after CO2, playing a significant role in global warming and climate change.

At present, the contribution of methane is about 20% in the anthropogenic radiative cause, only after carbon dioxide at 60% (Lassey, 2007). Methane is 25 times more potent in trapping atmospheric heating comparison to CO2 so acquired greater concern over these years. However, a comparatively low persistence period of about 10 years, compared to thousands of years in case of CO2 in the atmosphere, has led to increased global attention for implementing the emission reduction programs for methane.

According to the BUR (biennial update report) of India to the United Nations framework convention on climate change (UNFCCC) in 2010, the total emissions were reported as 19.8 (13.6-26.0) tg/yr and in this ruminants are contributing about 55%, followed by rice (17%), fossil fuel (13%) and waste (12%).

For quantifying the methane emissions from India between 2010 and 2015 and to investigate sources of discrepancies between the two inventories (Edgar and BUR,2010), used a combination of aircraft (passenger aircraft observations from caribic - civil aircraft for the regular investigation of the atmosphere based on an instrument container), satellite (GOSAT - greenhouse gases observing satellite) and surface observations and estimated the average emissions to be 22.0 (19.6-24.3) Tg/yr using the criteria of a high-resolution regional atmospheric transport model and a hierarchical Bayesian inverse modeling framework. Although these emissions data were similar to India's reports to the UNFCCC but were about 30% lesser than the global methane inventory(Edgar, 2010).

The agriculture sector plays a very important role and in this too enteric fermentation, manure management, rice cultivation) accounts for 61% of the total methane emissions in India, with 40%contributed by enteric fermentation, 17% from rice cultivation, and 4% from manure management(Garg et al.,2011). The Process of fermentation occurs in the rumen, a large forestomach, which under anaerobic conditions produces methane as a by-product of the feed digestion system. (Broucek,2014). Methanogenesis, also known as biomethanation, is a microbial metabolic process of anaerobic respiration in which methane is produced with the reduction of carbon dioxide (CO2) by hydrogen (H2) with help of the methanogen microbes viz., bacteria, viruses, fungi, protozoa, and others. Estimation of methane emission by various studies indicates wide variations in the output by the Indian livestock, as most of these are based on theoretical calculations and without any systematic experiments (Singh et al., 1996).

In general, Cattle and Buffalo produce about 200-250 litres and sheep and goats produce about 30-40 liter of methane per day (Trivedi et al., 2020). Out of the total methane emission of 11.75 Tg/yr from the livestock, cattle and buffalo are the major contributors (10.9 Tg/yr) compared to 0.86 Tg/yr emission from other livestock.

Further, (Patra AK, 2014) estimated enteric methane emission of 14.3 tg/yr for the year 2010 and projected the same to be 15.8 tg/yr and 18.8 tg/yr by 2025 and 2050 respectively. According to his estimation, cattle holds the first position in contributing enteric methane emission of about half (49.1%) of total enteric methane, followed by buffalo (42.8%), goat (5.38%), sheep (2.59%), and others (0.73%). Using a dynamic approach based on the Stella software along with a developed mathematical model, (Dahiya et al.,2016) estimated methane emissions in India for a 25 year period (2007-2032) under six different scenarios following IPCC emission guidelines. Under modified scenarios, the results indicated the emissions range from 13.85 Tg/yr in 2007 to 16.62 Tg/yr in 2032. The highest emission was observed in Buffalo (1155 kg CO2e CH4/head/yr) followed by cattle (672 kg CO2e CH4/head/yr) and goats and sheep (105 kg CO2e CH4/head/yr) in all scenarios.

ICAR-NIANP has developed a state-wide inventory of enteric methane emissions from livestock in collaboration with several partner organizations of the country which is found to be 9.253 Tg (Bhatta et al.,2020). The study reflected that Uttar Pradesh (16.42%), Rajasthan (8,75%), Madhya Pradesh (8.54%), undivided Andhra Pradesh (7.87%), and Maharashtra (7.57%) are the major contributor of enteric methane emissions of the country.

Along with the major contribution of methane from enteric fermentation, the emission of methane also takes place through the reaction from manure heaps which is much lesser as compared to contribution from enteric fermentation. In the case of manures, the cellulose content of the manure is degraded by the microbes in the process of methanogenesis (Richard et al.,2009). Manure generated from livestock production systems is generally dumped as such at one place in solid form before being transferred to the agricultural land. Low digestibility of dietary nutrients may be subject to the generation of a higher amount of fermentable organic matter in the manure, which can lead to increased production of methane in the manure. Sometimes, the wastes are also subjected to composting before application in agricultural land or digested anaerobically to produce methane gas to be used as biofuel for cooking. Annual methane emissions from manure management from Indian livestock were estimated through several studies which came out to be 0.91 Tg/yr in 1997 (Swamy et al.,2006)] and 1.13 Tg/yr in 2010 (Patra et al., 2014).

Carbon foot print of dairy farming

Product carbon footprint is the total amount of GHG emissions associated with a product, along its supply-chain, including emissions from consumption, end-of-life recovery, and disposal(IPCC 4th Annual Report, 2007). It is usually expressed in kilograms or tonnes of carbon dioxide equivalent (CO2-eq).

CO2-equivalent emission - It is the amount of CO2 emissions that could cause the same time integrated Radiative forcing as an emitted amount of long-lived GHG or a mixture over a given time horizon.

The CO2 equivalent emission is obtained when GHG emission is multiplied by its global warming potential for the given time horizon. The CO2 equivalent emission is a standard and useful metric involved in the comparison of emissions of different GHGs but does not imply the same climate changes (IPCC, 4 AR 2007).

Global warming potential - It is an indicator that reflects the relative effect of a GHG in terms of climate change considering a fixed time period, such as 100 years, compared to the same mass of carbon. The most potent greenhouse gas is methane and 1kg methane corresponds to 25kg co2 eq with a half-life of 9.1 years (EPA,2020). The overall contribution of the global milk production, processing, and transportation to total anthropogenic emissions is estimated at 2.7 %.

Sources of GHG emissions

Greenhouse gases are emitted from two sources: primary sources and secondary sources. Net CO2 emissions along with all methane and N2O emissions during the feed production, animal maintenance, and handling of manure are included under primary sources.direct and indirect GHG emission sources are reflected.

There are a number of sources that absorb CO2 from dairy farms and release it. One of the ways is carbon sequestration which is meant for the transfer and long-term storage of atmospheric CO2 into stable carbon pools that mean photosynthetically absorbed Carbon in .crop residues and manure is stored in soil organic matter(Bruce et al., 1999; Lal, 2008). An increase in C storage can result from changes that increase the amount of carbon entering the soil or reduce the rate of decomposition in the soil.

Primary sources of GHG emissions

Enteric fermentation produces the majority of methane followed by emissions from manure storage(EIA, 2006; Chianese et al., 2009). Ruminants produce CH4 via enteric fermentation which is released by eructation and respiration. The amount of CH4 produced depends upon factors like animal type and size, digestibility of the feed, Dry matter intake, total carbohydrates, and digestible carbohydrates (Wilkerson et al., 1995; Monteny et al., 2001). The model used to predict this emission and its sources are based on nutritional composition and management techniques that influence the animal's intake and diet. Enteric emission is affected by metabolizable energy intake and the ratio of the starch to the ADF content of the diet which was calculated using the nonlinear model (Mills et al.,2003). On a daily basis, CH4 emission is predicted by taking 6 possible animal groups on a herd basis, based on their diet which is determined by hewrd component of the model (Rotz et al., 1999). The calorific value and fiber content of the diet, total DMI, and the amount of each feed ingredient utilized are all determined by this component. The model predicts an increased CH4 emission with high-fiber diets and decreased emission with high-starch diets. For calculating gaseous emissions from animal feeding operations NRC (2003) recommended a process-based modeling approach that included nutrient mass balance constraints and appropriate component emission factors.

A Carbon balance is calculated by taking into account all fluxes in and out of cropland throughout the production of the feeds for the herd. the net difference between the carbon fixed during crop growth and that emitted through the plant and soil respiration must match the Carbon removed in harvested feed minus that applied to the cropland in manure in order to enforce a long-term equilibrium. The amount of Carbon applied in manure is equal to the amount of C excreted by the animals plus the amount of C in any manure imported to the farm, minus all C lost during manure handling and the amount of C in manure exported from the production system.

So, the net exchange of C in feed production is :

Cnet = Cfeed ? (Cexc ? CCH4 ? CCO2 ? Cexp + Cimp)

where Cnet is the net C assimilated in feed production (kg); Cfeed is the C in feed and bedding material produced minus that in excess feed and bedding sold (kg); Cexc is the C in manure excreted by animals on the farm (kg); CCH4 is the C lost as CH4 from the barn floor, during storage, and following land application (kg); CCO2 is the C lost as CO2 from the barn floor and manure storage (kg); Cexp is the C in any manure exported from the production system (kg); and Cimp is the C in manure imported to the production system (kg).

The C content of feeds is determined by their carbohydrate, protein, and fat contents having a carbon content of about 40, 53, and 70%, respectively, based upon their chemical structures (Bailey and Ollis, 1986). Therefore, the C contents of forages and grains, high-protein concentrates, and added fat are about 40, 45, and 70%, respectively. Cnet, or the net flow of carbon in feed production, represents a net CO2 exchange with the environment. The molecular weight of CO2 to that of C (3.67 kg of CO2/kg of C) is used to convert this C exchange to CO2 units.

Low- and medium-productive animals are used in smallholder dairying in India and other developing nations, and the animals are fed mostly with crop leftovers and other agro-industrial by-products. The diets are nutritionally unbalanced, resulting in inefficient production and reproduction. This has a detrimental impact on emission intensity

According to Makkar (2013), most emerging countries have a scarcity of high-quality feed ingredients. In addition, in smallholder dairy production systems, feeding uneven rations is common. As a result, India's average daily milk output of cows and buffaloes is extremely low, at 6.8 kg/crossbred cow (exotic), 2.5 kg/indigenous cow (zebu), and 4.9 kg/water buffalo (DAH, D&F 2014), potentially contributing to greater emission intensity

The Indian National Dairy Development Board (NDDB) has created a user-friendly ration-balancing (RB) software for preparing a low-cost balanced feed for dairy animals in the field. The NDDB created the RB program (RBP), a windows-based internet-connected application that compares an animal's current nutritional condition to its nutrient requirements. With the available feed resources and a mineral mixture, both sets of data are used to find the least-cost ration. The software works on desktops, laptops, and netbooks, and it may also be used on personal digital assistants in regions where there is no internet access. A feed-data library and multiple 'nutrition masters' are included in the RBP. A wide range of feed materials, including green and dry forages, tree leaves, cereals, oil cakes, and agro-industrial by-products, were collected from various Agro-ecological zones around the country and chemically analyzed to produce the feed-data library. Simultaneously, existing national and international feeding guidelines for nutrient requirements of growing, lactating, and pregnant animals were used to produce a variety of nutritional requirements 'nutrition masters' (Kearl 1982; NRC 2001).

Following registration, the program tracked the animal's daily feed consumption, including refusals, daily milk yield, milk fat level, body weight (BW), and pregnant status. On the basis of the data, the software determined the animals' nutrient requirements. In addition, the nutrient quality of the feed supplied to animals was analyzed in terms of metabolizable energy (ME), crude protein (CP), and key minerals, in relation to the requirements, based on current feeding practices. The software produced a least-cost BR based on the chemical composition of available feed supplies, maximum quantity accessible for feeding, and nutritional limitations, which was delivered to milk producers in a local language. Extension personnel visited milk farmers on a regular basis or if the availability of feed materials changed. (Food and Agriculture Organization of the United Nations, 2012; Garg et al., 2013).

Feedipedia was used to determine the digestibility of various cereals, crop by-products, and residues for ruminants. When determining digestible allocation, the proportion of digestible dry matter (DM) of each feed item in the overall amount of digestible DM produced by the respective crop was taken into account. Only milk was considered as a system output in this analysis, hence all GHG emissions were attributed to milk, resulting in a 100 percent allocation to milk.

Then the second most important gas is N2O N2O is the second most significant gas. Denitrification and nitrification processes in the soil where crops are cultivated to feed the herd are the main sources of N2O. The crust on the surface of a slurry manure storage, stacked manure, bedded pack manure on barn floors, and manure-laden dry lot surfaces can all be affected by these processes. N2O-N emissions from cropland were considered to be 1% of applied nitrogen, while those from grazed pastureland were assumed to be 2% of applied nitrogen, according to IPCC (2006) recommendations. Because crop production is not mimicked, the amount of nitrogen applied is designed to be 40% more than the amount eliminated in harvested feed. This method presupposes that N fertilizer is used efficiently in the production of feed crops. The 40 percent overapplication allows for the natural loss of nitrogen in crop production that occurs when N is applied at the prescribed rate to achieve nutrient removal. The total N in the feed consumed by the herd is calculated as the sum of the DM for each feed consumed times the protein content divided by 6.25 to forecast N application. For each animal group, this N is raised by 40% and multiplied by the appropriate emission factor and an N to an N2O conversion factor of 1.57 EF (IPCC 2006).

Secondary sources

The manufacture of fuel, power, machinery, fertilizer, insecticide, and plastic used in the manufacturing of feeds, animal maintenance, and manure handling are all considered secondary sources in the model. All secondary emissions are measured in CO2e units per year. Emission factors are used to calculate emissions during the generation of fuel and power (Wang et al.,2007). These figures are 0.374 kg CO2e/L fuel and 0.73 kg CO2e/kWh electricity. As previously stated, fuel consumption is estimated. The total amount of electricity consumed for milking-related activities, lighting, and ventilation is referred to as "electricity usage." It is estimated that 0.06 kWh/kg of milk produced is required for milking activities (Ludington and Johnson, 2003).

The C in gasoline is converted to CO2 and emitted in engine exhaust during the operation of tractors and other engine-powered equipment. The conversion factor for diesel fuel is 2.637 kg CO2/L. (Wang, 2007). Fuel use factors are used to estimate the amount of fuel consumed in the manufacturing system. These figures show the typical or average quantity of fuel used to make and supply a unit of feed to the herd, or to remove a unit of dung, respectively. The Integrated Farm System Model was used to calculate fuel utilization factors (Rotz et al.,2009).

Estimation of carbon footprint

Respiration calorimetry (closed or open-circuit), HDPE tunnel system, isotope dilution, tracer gas [i.e. sulfur hexafluoride (SF6)], and micrometeorological mass balance are the most popular in vivo measurement procedures (Kebreab et al., 2006). In commercial operations, new technologies are being developed to evaluate CH4 concentrations on an hourly basis utilizing rumen sensors (Laporte-Uribe and Gibbs, 2009) or by measuring CH4 eructated during feeding in robotic milking stations or at pasture feeders (Utsumi et al., 2011). Systematic discrepancies in measuring methodologies have been discovered (Kebreab et al., 2006; Muoz et al., 2012). In research settings that allow for animal confinement, respiration chambers remain the gold standard. Improvements to existing procedures or the development of new methodologies that allow groups to quantify CH4 emissions in a repeatable and accurate manner.

Estimation of carbon footprint is also done using a life cycle assessment system. The process used to calculate a product's carbon footprint is called life cycle assessment (LCA). LCA study considers all inputs and outputs for a specific product and production system across a system boundary, such as a dairy farm, a dairy plant, or the full dairy

production system. The research in Livestock's Long Shadow (FAO, 2006a) was the first step in evaluating GHG emissions from the global livestock sector using a food-chain approach.

For all key primary and secondary GHG exchanges with the environment, a partial life cycle assessment (cradle to farm gate) is employed to combine the most appropriate published linkages and emission variables. The emissions emitted from the farm or production system during the actual production process are referred to as primary emissions. Secondary emissions are those that occur as a result of the manufacturing or production of resources employed in the manufacturing process. A Carbon footprint is calculated by adding up all annual emissions from both primary and secondary sources and dividing by annual ECM output.

The dairy farm is often represented by a dairy production system, but the system's boundaries extend beyond the physical farm. All feed necessary to maintain the herd is produced as part of the production system. As a result, emissions from the production of all feed crops are included, regardless of whether the feeds are grown on the same farm as the animals or are acquired from a different farm. Unless a portion or all of the manure is labeled as exported from the production system, all manure nutrients are expected to be utilized in feed-crop production. This method allows for a comprehensive assessment of the entire milk production chain, which extends beyond specific farm limits. CO2, CH4, and N2O, which are all key greenhouse gases in dairy production, have varying potentials for trapping heat in the environment. The global warming potential equivalency index was created to standardize emissions (IPCC, 2001). Total GHG emissions in CO2 equivalent (CO2e) units are calculated in our model using global warming potential conversions of 25 kg of CO2e/kg of CH4 and 298 kg of CO2e/kg of N2O. (IPCC, 2007).

In agricultural and other industries, the life cycle assessment (LCA) method is commonly used to evaluate production's environmental consequences and to identify resource and emission-intensive activities throughout a product's life cycle. ISO standards 14040 and 14044 define the procedure (ISO, 2006). The ability of LCA to give a holistic assessment of production processes in terms of resource usage and environmental implications, as well as to incorporate various parameters, is one of its key features (ISO, 2006).

Many agri-food studies have utilized LCA to identify environmental hotspots and potential solutions to reduce environmental burden. (Roy and colleagues, 2009). The majority of the research was conducted at the farm level, excluding the last stages of product life (processing, transportation, disposal of packaging materials). Tamburini et al. (Tamburini et al., 2016). The functional units used to calculate GHG emissions in this study are kilograms of carbon dioxide equivalents (co2-eq.) per kilogram of FPCM and carcass weight at the farm gate. Using the following formula, all milk was transformed to FPCM with 4.0 percent fat and 3.3 percent protein:

Fpcm (kg) = raw milk (kg) * (0.337 + 0.116 * fat content (percentage) + 0.06 * protein content (percentage)

The steps involved in a life cycle analysis :

1. Creating a process map.
2. Defining the scope and bounds of the project (scope definition)
3. Data collection (inventory)
4. Compilation (impact assessment)
5. Reporting and evaluating (interpretation)

Mapping the process

The first step is to choose the project's aim, followed by the functional unit that will be the focus of the analysis, and finally all materials, activities, and processes that contribute to the life cycle of the chosen product. It's also crucial to choose between two different modeling approaches: attributional or consequential. It's critical to establish all of these from the start to ensure that the goal is clear, that all components of the process are involved, and that the project does not grow or expand into areas that are unimportant.

Defining the scope and boundaries

The scope of the analysis is established in the second stage. The scope of the study should include the general approach used to define the system boundary, which defines which unit processes are included in the LCA, as well as the study's aim.

Collecting the data

Data gathering and modeling of the product (e.g., milk, cheese) system, as well as data description and verification, are

all part of this step. This includes all data about processes occurring within the study's borders. The information must be associated with the functional unit.

Calculating the carbon footprint

The carbon footprint is calculated in the fourth phase utilizing all of the information acquired in the previous steps. The carbon footprint is calculated by converting all GHG emissions into CO2e figures and adding them together.

The GHG emissions for a functional unit are calculated using the following method:

1. Multiply the activity data by the emission factor for the activity to convert primary and secondary data to GHG emissions. GHG emissions per functional unit of product are calculated in this way.
2. The individual statistics are multiplied by the relevant global warming potential (GWP) factor to convert GHG emissions to CO2e emissions.

The sum of all materials, energy, and waste across all activities in a product's life cycle, multiplied by their emission factors, is the equation for the carbon footprint of the product.

Because the GWP factors have changed over time when utilizing this methodology to calculate a product's carbon footprint, the most recent IPCC GWP factors must be used.

1 kilogram of methane (CH4) equals 25 kilograms of CO2e 1 kilogram of nitrogen dioxide (N2O) equals 298 kilograms of carbon dioxide equivalent (CO2e).

Evaluating and reporting

The data should be presented appropriately and completely.

Mapping The procedure

❖ Creating a process

It is critical to be clear about the purpose of an LCA exercise from the start. Knowing the purpose - what is being assessed (the functional unit) and why, whom the results are meant for, and whether the results are to be used in public comparisons - aids in determining what is required to do the analysis.

❖ Defining the method

According to PAS 2050, the following steps should be followed to create a process map: Define the start and endpoints of the process being researched. Establish the functional unit. Make a list of all the steps in the procedure. Consider what you might have overlooked. Determine whether there are any co-products or by-products. List all inputs and their inputs from the beginning (for example, fertilizer used to grow feed for cow nutrition) to the end.

The functional unit for an on-farm study is one kilogram of fat- and protein-corrected milk (FPCM) at the farm gate in the nation where the analysis is being undertaken.

Using FPCM as the basis for farm comparisons ensures that farms with various breeds or feed regimens are compared fairly. FPCM is computed by multiplying milk output by the ratio of a farm's (or region's) milk's energy content to the energy content of standard milk with 4% fat and 3.3 percent real protein content.

FPCM (kg/yr) = production (kg/yr) [0.1226fat% + 0.0776true protein% + 0] .2534]

If the standard milk requires a different composition, the energy equation can be used to compute the new standard milk energy, which can then be used to recalculate the FPCM equation's coefficients. Lactose level in milk is generally stable at 4.85 percent.

Processing

The proposed functional unit at the processing gate is one kilogram of product with x percent fat and y percent protein, packaged at the dairy factory gate and ready for distribution in the nation where the analysis is taking place.

Reporting

The following 'important parameters' should be included in the report to gain a better knowledge of the researched systems.

Total carbon footprint, which is split into two categories: fossil and biogenic methane. Nitrous oxide, fossil carbon dioxide, biogenic carbon dioxide (biogenic carbon in packaging and land-use change carbon emissions should be stated separately) used as a functional unit, The percentage of emissions attributable to milk (i.e. the allocation factor between

milk and meat/calves, as well as the method used to calculate the allocation factor), Dry matter intake per cow and body weight per animal class, Milk yield per cow and milk composition, Dry matter intake split by feed type [at a minimum, the proportion of roughage and concentrate feed (grain/protein)] a system for managing manure, In the dairy production facility for the analyzed product, all emission, and GWP variables were used, as well as their sources and the Allocation factors.

Standardization bodies

ISO (International organization for standardization)

It is in charge of the ISO 14040, 14044, and 14067 standards. These are the first standards for calculating a product's carbon footprint.

IPCC (The Intergovernmental Panel on Climate Change)

It is the world's main body for climate change assessment. UNEP and the World Meteorological Organization (WMO) founded it.

FAO (Food and agriculture organization)

The methodology for assessing greenhouse gas emissions from the dairy sector is provided by the FAO. Recent studies by the United Nations Food and Agriculture Organization (FAO), such as Livestock's Long Shadow, have highlighted the global livestock industry's significant environmental effect (FAO, 2006a). When the full livestock commodity chain is considered - from land usage and feed production to animal farming and waste management, to product processing and transportation - the livestock sector accounts for roughly 18 percent of total anthropogenic GHG emissions.

Emissions are unlikely to decrease without concerted action. They are, on the contrary, increasing as worldwide demand for meat, milk, and eggs continue to rise. Total consumption is likely to rise as a result of projected population increase and rising affluence, with meat and milk consumption tripling by 2050 compared to 2000. (FAO, 2006).

Improving the dairy sector's carbon footprint is a critical component of long-term milk production. To do so, policymakers, manufacturers, and consumers need accurate and objective data. While more information has been available in recent years, it is still fragmented and not based on a uniform or comparable set of procedures, according to a study of recent literature and databases. As a result, obtaining a clear, global picture from publicly available data is impossible.

The international dairy Federation (IDF), which represents the private dairy sector, has decided to support FAO's environmental research to address this shortcoming and provide a system-wide assessment of the dairy sector's GHG emissions as a critical first step in identifying mitigation opportunities.

Conclusion

In India's agriculture sector, livestock is a major source of methane emissions. Enteric fermentation and manure management account for 91 percent and 9 percent of total methane emissions, respectively. When compared to other animals, cattle and buffalo are the biggest emitters of methane. In many countries, livestock methane emissions are a significant contributor to anthropogenic GHG emissions, and the focus is increasing to develop strategies to reduce these emissions. Currently,several techniques are being researched and developed. All techniques have distinct practicality, cost, and end-user adoption profiles. Although ruminant nutrition and feeding can have a significant impact on methane output. Manipulation of these animals' diets to reduce absolute methane emissions is both a practical and costly challenge. On an experimental scale, attempts to limit CH4 synthesis by ruminants utilizing methanogenesis inhibitors such as PSM, antibiotics, and biotechnological approaches such as rumen defaunation generated interesting results. Furthermore, such efforts to reduce methane production should be tested using in vivo animal experiments to determine the best doses for inhibiting methane emission while having the least negative impact on ruminal fermentation of feed, so that they can be used in practice for cost-effective and environmentally friendly livestock production. Features like live weight gain, milk production, and feed efficiency, genetic variation is already being used to reduce the emissions intensity of ruminant operations indirectly.

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KASHMIRI SAFFARON AND GI TAG.

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Kashmir saffron is renowned globally as a spice. It rejuvenates health and is used in cosmetics and for medicinal purposes. It has been associated with traditional Kashmiri cuisine and represents the rich cultural heritage of the region. The unique characteristics of Kashmir saffron are its longer and thicker stigmas, natural deep-red colour, high aroma, bitter flavour, chemical-free processing, and high quantity of crocin (colouring strength), safranal (flavour) and picrocrocin (bitterness).

It is the only saffron in the world grown at an altitude of 1,600 m to 1,800 m AMSL (above mean sea level), which adds to its uniqueness and differentiates it from other saffron varieties available the world over.

The saffron available in Kashmir is of three types - 'Lachha Saffron', with stigmas just separated from the flowers and dried without further processing; 'Mongra Saffron', in which stigmas are detached from the flower, dried in the sun and processed traditionally; and 'Guchhi Saffron', which is the same as Lachha, except that the latter's dried stigmas are packed loosely in air-tight containers while the former has stigmas joined together in a bundle tied with a cloth thread.

Saffron cultivation is believed to have been introduced in Kashmir by Central Asian immigrants around 1st Century BCE. In ancient Sanskrit literature, saffron is referred to as 'bahukam'.

Kashmir saffron, which is cultivated and harvested in the Karewa (highlands) of Jammu and Kashmir, has been given the Geographical Indication (GI) tag by the Geographical Indications Registry. The spice is grown in some regions of Kashmir, including Pulwama, Budgam, Kishtwar and Srinagar. Kashmir saffron, grown at an altitude of 1,600 meters, saw a steep decline in production by around 65%, from 16 metric tonnes to 5.6 metric tonnes, in 2018.

According to an official data, the saffron land cultivation has also come down to 3,715 hectares in 2009-10 from 5,707 hectares in 1996. Besides, saffron yield has shown a sharp decline from 3.13 kg per hectare to 2.5 kg per hectare.

Kashmir saffron faces stiff competition from Iranian saffron, which has captured over 90% share of the world market.

- It has been associated with traditional Kashmiri cuisine and represents the rich cultural heritage of the region.
- It is a very preciousand costly product.
- In ancient Sanskrit literature, saffron is referred to as 'bahukam'.
- It is cultivated and harvested in the Karewa (highlands) of Jammu and Kashmir.
- Uniqueness:The features which differentiates it from other saffron varieties available the world over are:
- It is the only saffron that is grown at an altitude of 1,600 m to 1,800 mabove mean sea level.
- It haslonger and thicker stigmas, natural deep-red colour, high aroma, bitter flavour, chemical-free processing.
- It also has a high quantity of crocin(colouring strength), safranal (flavour) and picrocrocin (bitterness).
- Types:There are three types of saffron available in Kashmir - Lachha Saffron, Mongra Saffron and Guchhi Saffron.
- Uses:
- Kashmir saffron is used globally as a It also helps in revitalizing health.
- It is used in cosmeticsand for medicinal purposes.
- Benefit of tag:With the GI tag, Kashmir saffron would gain more prominence in the export market.
- Iran is the largest producer of saffronand India is a close competitor.

The GI tag for Kashmir saffron will go a long way towards restoration of this exotic and expensive spice to its rightful place of pride. Kesar from Kashmir has, at long last, been granted the geographical indicator (GI), and one hopes that this will encourage our coHopefully, this recognition will encourage consumers to take some trouble to distinguish between real and fake saffron. Many suffer from the misconception that Spanish saffron is the 'best in the world', and our own produce is inferior to it. This canard has originated because of large-scale adulteration in saffron from Kashmir. The GI tag should go a long way towards restoration of this exotic ingredient to its rightful place of pride. Kesar, saffron or zafran, call it by any name, is the most expensive spice by weight in the world. Almost 45,000 flowers contribute their

aromatic and flavourful stamens to make up this measure. The most premium quality commands a price of up to Rs5,00,000 per kg!mpatriots to take pride in this unique product of a province that has been called Paradise on Earth. Let the world share the sublime aroma, flavour, enchanting hue and rejoice.

Land of violet blooms

Not far from Srinagar lies the township of Pampore - the name derived from original Sanskrit Padmapura - City of Lotuses. Emperor Jehangir chronicled in his diary how overpowering was the fragrance of the violet-petalled blossoms in autumn when the 'crop' covered like a carpet hundreds of acres of flatlands. The lover of good life also thought that the height of ecstasy could be experienced on a full moon night in Pampore in autumn, when countless blossoms bloomed stretching as far as one could see. Legend has it that zafran was brought to the Valley some time in circa 5th century after the birth of Christ by two itinerant Sufi saints from Persia. As the folklore has it, the saints had been both cured of a painful chronic ailment by a local physician, who was gifted by the grateful patients with a bulb of the rare flower with miraculous properties. The transmission from Iran is quite plausible as Kashmir is referred to in some early texts as Iran Sagir (smaller Iran). Its cuisine and crafts, language and manners carry a deep Persian imprint.

Kashmiri Pandit tradition, however, narrates another story. Great physician Vagbhatt is once said to have cured a serpent demigod disguised in the human form of a painful eye disease. It is from this celestial patient that he received this precious gift. It appears that practitioners of ayurveda in India were familiar with this ingredient and its medicinal properties as it is described in some detail in Bhavaprakasa Nighantu - traditional Indian materia medica dating back to the 4th century.

Strands of good health

Time-tested properties of saffron are believed to be restorative, rejuvenating and by implication aphrodisiac. It is an essential ingredient in ayurvedic preparations like chyawanprash. The royals in Rajasthan commissioned their distilleries to produce liquor for special occasions. The master craftspersons came up with kesar-kasturi - a potent blend of saffron and musk. Saffron is believed to have a warm property - garam taseer, and it is essentially a winter spice. The writer of these lines recalls mother fortifying us in freezing winter to build immunity against cough and cold with milk laced with kesar, cardamom and almonds. When kesar was not at hand, a pinch of turmeric, aka poor man's saffron, replaced it.

Saffron is used to enrich and garnish both vegetarian and non-vegetarian recipes in the subcontinent. It is impossible to imagine a biryani that is cooked without it. A few strands are often carefully sprinkled to make the diner believe that he is being treated with exotic ingredients. Kesari, the rawa halwa, was obviously named after the ingredient that lent it colour and taste. More often than not, this confection is nowadays artificially coloured and only a few strands of saffron may be used as garnish.

Masala chai may have just a hint of its essence but the kahwa in Kashmir that is poured in a light golden stream from a samovar relies on it to create magic on the cold winter mornings. Kesar adorns the rich bread sheer maal that is prized in Lucknow and Hyderabad. It enriches the thickened milk garnished with almond flakes. Frozen desserts like kulfi and desserts like kheer and phirni seem incomplete without kesariya garnish.

In Benaras, we were once treated to a delectable kesar bati, a confection conjured out of saffron-laced clotted cream.

The ubiquitous bundi ka laddoo becomes extraordinary motichoor by incorporating a few strands of the aromatic substance. Lassi and thandai, in their saffron-laced version, rank a notch higher than the plain stuff. In Bengal, saffron adds a touch of subtle elegance to prawns cooked in coconut cream and a zafrani fish curry that seems to have been influenced by Mughal culinary practices. In Maharashtra, kesar is an essential ingredient along with green cardamom seeds in the delectable shrikhand.

Beyond cuisine

It is not only in the realm of cuisine that saffron is valued. It is considered to epitomise excellence and elegance in diverse fields. It is the colour symbolising valour, sacrifice as well as renunciation and selfless service. Kesariya banna, the chivalrous young warrior dressed in saffron-coloured attire, is extolled in Rajasthani folk songs that resonate in the vast desert far removed from the Vale. One of Mira Bai's celebrated bhajans uses the metaphor of saffron to praise virtues like love and compassion. Kesar, called kumkum in Sanskrit, is traditionally used at almost all ritual worship. The auspicious tikka put on the forehead was to be prepared with saffron mixed with a substance to bring out the bright colour. Like chandan (sandal), kesar, too, was an indispensable part of the shringar - formal makeup.

Perfumers have used it for generations in seductive perfumes. Tobacconists in Kannauj, the city famous for Indian ittar (perfume), have used it for generations to create intriguing perfumes. Ittada Khan, Muttada Khan, in days gone by, used strands of zafran to aromatise its mushki dana ilayachi dana tobacco pellets draped in silver leaves. Sugandhis like Dharm Pal Prem Chand and Satya Pal continue with the practice in their more expensive products Baba or Tulsi chaap. Kesar is rendered more potent blended with silver leaf and other aromatic substances. Lest you start accusing us of promoting a narcotic, let us hasten to add the silver leaf-draped saffron-flavoured green cardamom seeds are also available!

Guerlin in France has named one of its upmarket perfumes as Shalimar, doffing its proverbial hat to saffron from Kashmir. While saffron is absent in East Asian and South East Asian cuisines, it is used in delicacies in the Middle East and Europe. In Italy, risotto is subtly flavoured with saffron and in Spain, it makes paella and many other sea food delicacies more tempting. The strands of saffron make every dish a joyous festive fare.

STRATEGIES TO IMPROVE CONCEPTION RATE IN BOVINES

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Introduction

The simple solution to boost dairy cattle conception rates (CR) is to improve reproductive management and micro environment in cattle sheds, as these two general categories account for 96 percent of Conception Rate variation.More specifically, nutrition (energy , mineral balance and feed molds and mycotoxins), animal health (metabolic disorders and reproductive system soundness), reproductive practices (heat detection and insemination practices) and data management influence most of the reproduction puzzle.

Factor affecting the conception rate :-

1) Dry period

Cows with short dry periods (less than 60 days) experience an earlier first ovulation and improved fertility at first and second insemination. Excessively long dry periods (beyond 100 days) may lead to poorer reproductive performance. As the dry period lengthens, cow fertility decreases in the next reproductive cycle.

2) Close-up period

During the close-up period, strive to maximize dry matter intake by feeding a balanced ration with nutrients, such as calcium, at the proper dietary cation-anion difference, along with proven feed ingredients that include essential fatty acids. Feed the close-up ration for a minimum of 14 days.

3) Calving

To enhance transition period and future conception rate success, provide cows with a clean and dry calving area with minimal stress. Inferior conditions and calving assistance may lead to dystocia, retained placenta, metritis or endometritis. previous studies revealed that cows with dystocia and clinical endometritis were 67 and 55 percent, respectively, more likely to lose their pregnancies during the first 60 days of gestation compared with healthy cows.

4) Post-calving

Metabolic disorders influence conception rate. To help cows experiencing subclinical ketosis, consider giving them oral propylene glycol. Has been studied that the said protocol reduced the development of a displaced abomasum. Cows were less likely to be removed from the herd during the first 30 days in milk are more likely to conceive to the first service.

5) Estrus synchronization

It probably goes without saying but, as a friendly reminder, strict compliance with injection and hormonal management protocol is crucial for carrying out a successful synchronization program. Variations from protocol explain the outcomes of timed-A.I. programs. Poorer-than-expected performance is almost always attributed to compliance issues at the farm level.

6) Insemination

Just like milking procedures, evaluate individuals' heat detection, semen handling and breeding techniques on a regular basis. Check for compliance with established procedures. Similarly, follow industry guidelines for proper semen handling, semen thawing and cleaning breeding implements. While speediness is often admired, don't let speed get in the way of effectively getting cows bred.

7) Data management

Data can be your friend in evaluating technicians and protocols. For example, Dairy Comp 305 allows you to evaluate conception rate through many traits. Using the evaluation by heat interval (Bredsum\I) is one way to evaluate conception rate at 4-17 days since last Artifical insemination. A reduced CR in this segment will show inseminators are breeding cows that are not in heat or the heat detection process is not accurate. To avoid breeding cows and heifers in this heat interval range, provide the inseminator a daily updated breeding list.

8) Mastitis

While fertility and udder health may seem like vastly different health challenges, research continues to show a strong correlation. Researchers estimated the cost of each incident of clinical mastitis occurring in the first 30 days of lactation at $444. Part of this amount considers the negative effects of mastitis on overall reproductive performance. The presence of endotoxins produced by the mastitis pathogen induces the release of chemical neurotransmitters and hormones responsible for local responses, such as redness, swelling, pain and function loss. These mediators and hormones can affect reproductive performance and pregnancy loss. Researchers found the time when clinical mastitis occurs can extend days open from 85 days in an uninfected cow to 106 days if the infection occurs before first service and up to 143 days if the infection occurs between first service and pregnancy diagnosis. A significant conception rate reduction also occurs. A study demonstrated the occurrence of mastitis is associated with a prolonged interval to first postpartum Artificial Insemination

9) Stats evaluation

Evaluating reproductive performance encompasses several factors, so avoid just looking at a single performance measure or statistic. Monitor several factors, such as Conception rate , pregnancy risk, days in close-up pen, calving difficulty, days dry and heat interval. These measurements provide valuable information that can be used to find opportunities to improve procedures and protocols that influence outcomes.

10) High-risk cow list

Establish fresh cow protocols, including procedures for cows that didn't have a textbook lactation or dry period (e.g., extended days in milk, too short/long dry period, calving difficulty). Giving a little extra attention to high-risk cows will help prevent challenges in the next lactation. Daily, use your dairy software to print a high-risk fresh cow list and proactively manage these cows. For example, give propylene glycol, if appropriate, to prevent the effects of subclinical ketosis. Work with your herd veterinarian and nutritionist to develop strict management protocols. Taking advantage of farm information can be an excellent strategy to proactively work with specific cows, if all information is accurate and gathered correctly. Regular conception rate evaluation by heat interval and cows with high somatic cell count offers an excellent opportunity to reduce the negative effects of these health challenges on conception rate. To improve conception rate, reduce culling rates and lower the incidence of metabolic disorders, develop a proactive fresh cow protocol for cows in the high-risk group.

Strategies to improve the Conception rate in bovines :-

1. Improvement of conception rate at and after AI

The challenge to improve the reproductive performance of lactating dairy cattle requires an understanding of the biochemical and physiological principles controlling reproduction and lactation. This then needs to be integrated into nutritional, production and reproduction management systems to optimise the fertility of the herd. Pharmacological attempts to improve fertility in inseminated cattle have concentrated on three areas so far: timely induction of ovulation, prevention of early embryonic loss through increasing progesterone concentrations in the general circulation or prevention of precocious luteolysis minimising the reproductive effects of heat stress.

2. Prevention of delayed ovulation : To ensure timely ovulation in relation to service. One of the methods of obtaining satisfactory conception rates is to ensure that ovulation occurs within 7-18 hours of AI. One possible method is by the administration of GnRH around the time of service. Depending on the size and maturity of the dominant follicle, preovulatory LH surge and ovulation usually occur within 24 hours of GnRH injection, which is similar to the time between the onset of oestrus and ovulation. it is postulated that the administration of GnRH analogues at the time of insemination may modify the function or characteristics of pre-ovulatory ovarian follicles and the secretory capacity of the developing corpus luteum. Results reported by these authors suggest that GnRH may have served to enhance or alter theca-lutein or granulosa-lutein differentiation in the pre-or post-ovulatory follicle, or developing

corpus luteum, and may have acted on the developing corpus luteum to promote the conversion of small to large luteal cells, thereby Increasing the progesterone secretion

3. Support of luteal function and prevention of precocious luteolysis :

Several attempts have been made in high-yielding cows to prevent early embryonic loss, especially in those exposed to heat stress, and embryo transfer recipients. Several methods have been tried to increase conception rates by increasing plasma progesterone concentrations during the luteal phase. This can be achieved by inducing the formation of accessory corpora lutea, which can be obtained by hCG treatment for 4-6 days after insemination . Apart from the initiation of additional corpora lutea, this treatment is believed to provide further LH support to the corpus luteum verum, which results from the ovulation of the dominant follicle.

5. Prevention of precocious luteolysis

A number of recent studies have been devoted to the analysis of the effect of GnRH treatment in mid-cycle (usually 11-14 days post insemination) on embryo survival and the resulting pregnancy rate. GnRH treatment aims at enhancing embryo survival by suppressing the luteolytic mechanism that ensues if there is no maternal recognition of pregnancy. Depending on the stage of follicular development, treatment with GnRH analogues during the luteal phase causes luteinization or ovulation of the existing responsive luteal phase follicles, which continue to grow after the ovulation of the dominant follicle of the previous cycle.

6. Strategies to decrease the negative impact of heat stress on reproduction in dairy cattle

Measures aimed at reducing the negative impact of heat stress on reproduction in dairy herds should always include reducing the exposure of cows to heat as well as any biotechnical or pharmaceutical approaches aimed directly at fertility improvement

The possible options include :

- ❖ Changes in production system
- ❖ Selection of heat resistant breeds (bos indicus and crosses)
- ❖ Embryo transfer
- ❖ Hormone therapy

7. Administration of GnRH at the time of artificial insemination

The administration of GnRH during the early stages of oestrus is believed to induce an enhanced LH surge and to improve the synchronization of the intervals between oestrus, LH surge, ovulation and insemination. Moreover, induction of ovulation, with the administration of GnRH at oestrus, allows for a reduction in the incidence of delayed ovulation and prolonged follicular dominance associated with the effects of heat stress.

8. Estrus detection accuracy

As accuracy of estrus detection increases, the conception rate also increases.

9. High stocking densities

High stocking densities in the breeding pen were also associated with reduced conception rates.so reducing stocking density will increase the conception rate.

10. Voluntary waiting period

There has been found a positive relationship between length of the voluntary waiting period and the first-service conception rate. Cows serviced before 50 days postpartum had a lower conception rate than those serviced after a longer postpartum period. So optimum voluntary waiting period will definitely increase the conception rate.

●❖●

ECOLOGICAL IMPORTANCE OF ELEPHANTS

Dr. Madhvee Dhairykar
SWFH, NDVSU

"Elephants are not just flagship species; they are so much more."

"Elephants play a crucial role in our environment. They provide numerous ecosystem services, such as providing food, shelter and water, helping to create pathways in forests, and identifying salt licks. These services not only benefit elephants, but other species as well."

Elephants are the largest mammals on land, and they are found across Africa and Asia. Elephants are also among the most intelligent species on Earth and are the descendants of mammoths, which have continued to fascinate humans long after their extinction. These broad-eared creatures also play a crucial role in several religions, cultures and traditions across the world, and several communities worship them. Elephants serve a critical role in our ecosystem and are therefore known as a "keystone species." Keystone species are those that provide vital ecosystem services, many of which are essential for the survival of other species in the community.

There are some of the amazing services that elephants provide and how this helps other animals!

Elephants create watering holes during drought

Many regions around the globe are facing a crisis of water scarcity. During these times of intense drought, elephants use their trunks to sniff out areas where water may be found underground. They can then use their tusks to dig for water and create new watering holes, which allow them to survive during the drought season. These watering holes are not only used by elephants, however, but many other species as well.

Elephants disperse seeds

As we know, elephants are herbivores, meaning that they consume many plants, along with their seeds! Elephants eat these seeds and then plant them on their wanders via their dung. These seeds, in turn, grow into new plants, grasses and bushes. The dung also acts as a fertilizer and provides numerous nutrients that promote germination and growth. As elephants move from one area to another, they help plants colonize and grow in newer regions, thus creating additional habitats for animals.

Did you know that African elephants are capable of dispersing seeds from 335 different plant species and Asian elephants can do the same for 122 different plant species?

Elephants create new paths

As we know, elephants are a solid, well-built species, which means that they are capable of trampling quite a few plants while walking from one area to another. This creates a clearance in densely vegetated areas, enabling smaller animals to move more freely. Similarly, elephants pull down and uproot thorny bushes, which further helps in clearing safe pathways for smaller animals. The clearance of some thorny bushes also allows more light to reach the ground, which promotes the growth of new plant species and reduces competition. Elephants are not only clearing the way for smaller animals, but also creating more opportunities for plants to flourish!

Elephants provide food

Elephant dung is a food resource for many species, primarily insects. Given that elephants defecate over 15 times per day. Their dung creates ample food for those species that rely on it. As a result, innumerable insects swarm near freshly deposited dung. These swarms then act as a food source for birds who feed on the insects. Dung beetles are also known to collect elephant dung and store it as a source of food for their larvae. Honey badgers then capitalize on this collection and feed on beetle larvae!

It has observed butterflies visiting fresh dung, as it keeps them warm. They have also reported that dung contains minerals that are essential for reproduction, and is therefore ingested by male butterflies.

In addition, when elephants forage for food, tree branches, leaves and twigs will fall to the ground. This helps in the pruning of trees, which facilitates their growth. These fallen tree parts become food for large herbivores like gaur (Bos gaurus) and sambar deer (Rusa unicolor), who also share ecosystem space with elephants.

Elephants provide shelter

Just as they provide food, elephants also provide shelter for smaller creatures, especially amphibians and insects. It has observed that during the dry season, elephant tracks fill up with water, which creates an ideal environment for frogs to lay their eggs and for tadpoles to grow. Also, the footprints of elephants provide predator-free breeding grounds for frogs and act as connecting sinks for frog populations to connect.

Elephants helps in finding natural salt licks

Minerals are essential for the growth and development of most creatures, including elephants. In the wild, elephants obtain the minerals they need from plants. When resources are scarce, however, they can obtain other minerals, especially sodium, directly from the soil. Elephants, which have a good sense of smell, use their trunks to detect areas in the ground that have large quantities of minerals. They will then use their tusks to dig into the soil and then bend down to eat it. These salt lick sites are not only used by elephants, but also other herbivores who may need to increase their mineral intake.

As we can see, elephants play a very important role in their respective ecosystems. Their role can neither be replaced nor played by any other species, which is why organizations around the world have been working hard for decades to protect these creatures and ensure their survival!

BASICS OF TRICHOLOGY : IT'S IMPORTANCE IN VETERINARY FORENSICS

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Indian subcontinent is well known for its mega-diversified population of flora and fauna in 2.4% of the world's land area with 7-8% of all recorded species, including more than 45,000 species of plants and 91,000 species of animals.

Hair in mammals is composed of the hair follicle, root and hair shaft. Follicles are formed only once in the life time of an individual. Physiologically hair fibres form a protective layer over the surface of epidermis protecting the animals from injury, snake bites etc. Hair has the capability to respond to external stimuli and any movement of the fibre is picked up by the hair follicle which is transmitted as a message to the nervous system. The hair fibre is regarded as an "antenna" of the mammals to receive sensory stimuli. Hair also plays an important part in controlling the body heat by providing insulation against sudden heat loss or gain.

Hair is not only important from physiological point of view, but also from forensic aspect as it can help to solve the most complicated vetero-legal cases. Due to human activities like poaching and deforestation many wild mammals are now endangered. Due to this reason, identification of animal species became important in crime investigations in case of poaching and trading of animal parts.

All hairs, whether utilized for textiles or not, have cuticular scales on their surfaces, and most hair (exempting wool) shows presence of a medulla in its centre, the width of medulla is generally found as half or little more of the total diameter of hair shaft (Kirk, 1953). Again, hair can resist putrefaction so it serves as an evidential value where other evidence are either not sufficient or are found unsuitable for crime investigation due to adverse natural environmental conditions.

Therefore, Trichology, an important branch of Biological science that deals with the study of hair which is of utmost importance in Veterinary forensics. The literal meaning of the Word "Trichology" means a branch of medical and cosmetic study of hair and scalp. But when it comes to application of Trichology in Veterinary Forensics one has to understand what is Veterinary Forensics and role of Veterinarians in Forensics. Veterinary forensics is a field of crime investigation wherein scientific knowledge is applied to collect and examine evidence from crime scenes where animals have been killed, particularly those that have been protected by Law. Whether a Vet has been engaged in domestic or wildlife crime investigation, one has to be very careful during the crime investigation and meticulously analyse the evidence before drawing any conclusion while preparing the report.

Animals have three types of hair (Dyce et al., 1996):

1. Guard hair : straight and rather stiff outer hair, provide a top coat to the underlying fur coat of the body,
2. Wool hair : fine and wavy, provide a undercoat of the body
3. Tactile hair : stout and have restricted distribution and is responsive to mechanical stimulation.

A single hair on a macro-scale has -

(1) A root,
(2) A shaft, and
(3) A tip.

The root of hair is the proximal most portion of the hair and is in the follicle.

The hair shaft is the main portion of the hair that projects above the skin.

The hair tip is the distal most portion of the hair.

Basic components of hair are -

1. Keratin (a protein),
2. Melanin (a pigment), and

3. Trace quantities of metallic elements.

There are three main structural elements in a hair from outside to inside are -

1. The cuticle,
2. The cortex, and
3. The medulla.

Hair cuticle or cuticular scale pattern is mainly of three types-

1. coronal (crown-like),
2. spinous (petal-like), and
3. imbricate (flattened).

The coronal, or crown-like scale pattern, is found in hairs of very fine diameter and resemble a stack of paper cups, for example hair of Tiger (Fig. 1), small rodents, bats and rarely in human hairs.

Spinous or petal-like scales are triangular in shape and protrude from the hair shaft, found in mink hairs and on the fur hairs of seals, cats, and some other animals. They are never found in human hairs.

Imbricate scales - cuticular scales are overlapping with narrow margins, commonly found in human hairs and many animal species eg. Mithun (Fig.2)

Hair cortex: Hair cortex (Fig.3) is made up the bulk of the hair. It is the mainly composed of elongated and fusiform (spindle-shaped) cells.

Other structures present in hair are-

Cortical fusi : Cortical fusi are irregular-shaped airspaces present in hair which may be of varying sizes

Pigment granules: Pigment granules are small, dark, and solid structures which are granular in appearance commonly found in cortex.

Large oval-to-round-shaped ovoid bodies : Ovoid bodies are large (larger than pigment granules) are solid structures that vary from spherical to oval in shape, with smooth margins. They are abundantly found in hair of some cattle and dog as well as in other animal hairs.

Hair medulla : Hair medulla is composed of round cells in case of thick or coarse hair (guard hair of animals and usually absent in fine hair or down hair. Presence or absence of medulla is species specific and in some species of animals it is found to be gender specific. In some species medulla is composed of sparse cells and air bubbles. Hair medulla constitutes the central core of hair. When filled with air, it appears as a black or opaque structure under transmitted light and when filled with mounting medium or some other clearing substance, the structure appears clear or translucent in transmitted light, or nearly invisible in reflected light. In human hairs, the medulla is generally amorphous in appearance, whereas in animal hairs, its structure is frequently very regular and well defined.

Gross examination of hair strands of animals show three different types of medulla-

- Fragmented or trace,
- Discontinuous or broken, and
- Continues type.

Micro-morphologically there is different type of hair medulla found in animals. They are-

- Uniserial ladder
- Multiserial ladder
- Cellular or vacuolated type
- Lattice type

Other parameters of hairs that are to be studied to solve crime investigation are-

- Length of hair
- Colour of hair
- Diameter of shaft
- Thickness of cortex

- Diameter of medulla
- Medullary index as per Kirk (1953)
- Cortico-medullary index as per Kirk (1953)

Importance of guard hair in crime investigation-

- Being the outermost hair coat of the animals, it is mostly left behind in the scene of crime by the criminals.
- Guard hair make good forensic evidence because they can survive for many years, they carry lot of biological information, and are easy and effective to examine.
- Hair is chemically most stable, resist putrefaction and retain its morphological characters for a long duration/ period.
- Retains their uniqueness despite of processes like ageing, digestion and change in the environment

Veterinarians Role in Crime investigation (Forensics):

- Veterinary forensic experts convert the clues collected from the scene of crime into evidence admissible in the court of law.
- Any biological samples or skeletal parts provided by Police Department, Forest Department, and Excise Department etc are to be properly investigated before submitting the report to the court for conviction of the criminal.
- To ascertain the cause of death of an animal suspected to be poisoned or diagnosis of diseases, necropsy should be carried out following standard post mortem protocol.

Very often forensic samples like meat and guard hair of animals are sent for species identification and these forensic samples are mostly from fringe areas of Wildlife National Parks, Wildlife National Sanctuaries and wildlife protected areas. Now the matter is how smartly the Veterinary forensic expert can act and prepare the report that is to be submitted in the Court of Law for conviction of the criminals indeed.

Many a times the author had to address such issues case-by-case to solve various vetero-legal cases and one such case is being discussed as to how such cases should be handled by a Veterinarian (location of incidence is not mentioned as the case is in the court). The story behind the incident was that a meat seller was selling pork (pig meat) in the open market which happened to be suspected as meat of wild pig. This information immediately reached the concerned authority, the meat was confiscated by the concerned authority and the seller was kept behind bar. The meat sample with hair strands adhering to the meat was sent for the species identification. Since it was a vetero-legal case and the report had to be sent to the Hon'ble Court of Law for conviction of the suspect, the author had to carry out the different parameters step-by- step, the procedure discussed hereunder for preparation of an authentic report. The first step was macro-morphological study of guard hair stands.

Macro-morphological or gross study of the hair strands gave the clue that it was of a wild pig

In the above slide , the hair strands on the right slide showed split ends which were a gross characteristic of hair of wild pigs and similar features were shown in the slide on the left which is taken the data base prepared by the author in the departmental laboratory.

Some hair strands of the forensic sample and few hair strands were domestic/ local pig of Assam were processed for micro-morphological study and their medulla pattern was compared with the database which showed that the medulla pattern showed the characteristics of wild pig.

As the culprit was kept behind bars therefore, for conviction of the offender, mtDNA sequencing from hair bulbs was done to ascertain accuracy in the report that was sent to the Court of Law.

From the above study it was confirmed that the forensic sample was that of wild pig.

With the quote of the famous chemist late Paul L. Kirk, from Crime Investigation let me conclude-

"Wherever he steps, whatever he touches, whatever he leaves, even unconsciously, will serve as a silent witness against him. Not only his fingerprints or his footprints, but his hair, the fibres from his clothes, the glass he breaks, the tool mark he leaves, the paint he scratches, the blood or semen he deposits or collects. All of these and more bear mute witness against him. This is evidence that does not forget. It is not confused by the excitement of the moment. It is not absent because human witnesses are. It is factual evidence. Physical evidence cannot be wrong, it cannot perjure itself, it cannot be wholly absent. Only human failure to find it, study and understand it, can diminish its value."

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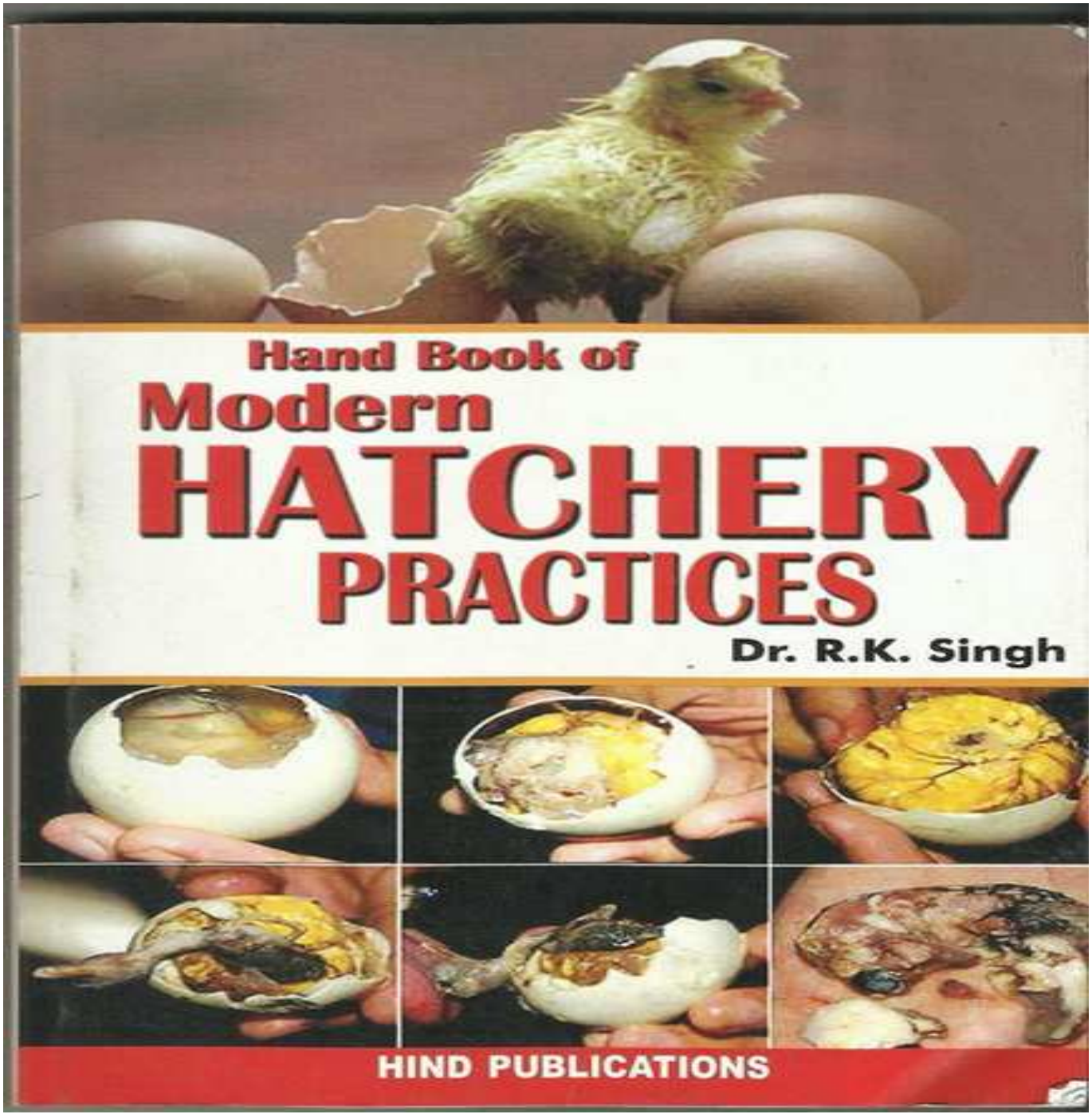

INSTITUTIONAL SUPPORT SYSTEMS AND WAYS TO REVITALIZE THE INTEGRATED FARMING SYSTEM

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The fact that growth in small farm agriculture critically depends on the performance of the supportive institutions has been repeatedly emphasized by many report. Additionally, time to time reforms in the institutions responsible for agricultural research, extension, credit and marketing are utmost necessary, in order to enable them to perform their expected roles and contribute to the growth of the income and welfare of the farming community. Few important aspects of these are:

1. **Agricultural research:** The growth in agriculture will be largely based on the development of improved technologies and their timely widespread dissemination among the farmers. Agricultural research and the transfer of improved technologies has to be a prime growth provider for ensuring sustainable growth in the future. In relation to this, the results are not very promising in Indian context as even the developed technologies have not been widely adopted by the farmers.
2. **Extension:** As in several parts of the country, the weakest link in agriculture sector is proper extension set-up. This is evident from the fact that a nation-wide survey of farmers conducted by the NSSO in 2003 reported that only about 5.7 per cent of the farmers, received information on modern technology from extension workers.
3. **Credit:** Institutional credit is a pre-requisite for increasing agricultural production and its value addition because most of the farmers (more than 90 per cent of the farm households) belong to marginal and small categories (owning <2 ha of land), whose income is not even sufficient to meet their daily consumption requirements. In context to this, the institutional agricultural credit flow has been inadequate and farmers depend more on non-institutional sources for meeting their credit requirements. Marginal and small farmers, who have no collateral to offer for mortgage, and tenant farmers who have no title to land, and are incapable of following the required procedural formalities to access formal sources, prefer to approach the easily accessible non-institutional sources such as moneylenders and traders, who charge high interest rate (50 to 120 per cent/per annum). In this regard the following schemes must be strengthened and revised time to time.
    a. **Kisan Credit Card:** The Kisaan Credit Card (KCC) scheme is a credit scheme introduced in August 1998 by Indian public sector banks. This model scheme was prepared by the National Bank for Agriculture and Rural Development (NABARD) on the recommendations of the R. V. Gupta Committee to provide advances for agricultural needs. The Kisan Credit Card (KCC) has emerged as an important means of increasing short-term agricultural credit. But the number of KCCs were meager and needs to be increased to fulfill the goal behind it.

b. **Micro Finance:** The main cause of farmers suicides in India is high debt. And since these farmers don't have protection under any limited liability laws, nor are their bonuses protected, they stand to lose their land, and pass on their liability to their helpless children. Self-help Groups (SHGs), Joint Liability Groups and Farmers' Clubs facilitate the disbursement of trouble-free loans to the weaker sections of society. These organizations are gaining ground in other parts of the country.

c. **Co-operatives:** Co-operatives are still considered as the most suitable organizations for providing credit to farmers. The states with strong co-operative institutions are still excelling in providing agricultural credit to farmers.

4. Marketing: The Steering Group considers improvement in marketing as equally important for realizing fair prices for agricultural produce. Farmers are not able to sell their surplus produce remuneratively and there are widespread distress sales, particularly by marginal and small farm households. Keeping in view the scale and the objectives of agricultural growth envisaged in the coming years, the problems inherent in the systems and structures of agricultural marketing have to be addressed on a priority basis. In order to ensure efficient marketing, the following steps need to be taken:

   a. Encouragement to the organization of genuine co-operative marketing societies: Except for the dairy sector, there are no genuine co-operative marketing societies. Various models of the traditional as well 'new style' co-operatives need to be encouraged, and be allowed to function without bureaucratic interference and with professional management.

   b. Encouragement to contract farming: Vertical integration with large marketing and agro-processing firms should be encouraged. Care has to be taken to keep all such contacts transparent and fair. Dispute settlement arrangements should be in place at the local level.

   c. Strengthening marketing infrastructure: The number of marketplaces should be increased to bring it close to the all-India level. Facilities at the designated marketplaces should be upgraded and made more attractive. A massive programme of construction of rural godowns and cold storages should be undertaken. Private sector participation in these investments should be encouraged either independently or as part of supply chains. Arrangements should be made with the credit institutions to ensure that they honour warehouse receipts and pledges.

   d. Comprehensive and timely information on agricultural prices: The producers should be provided relevant and accurate information on prices and market arrivals, by establishing IT-enabled village information kiosks all over the state. Forward markets need to be made operative with the overall guidance of the Forward Market Commission.

   e. Removal of policy hurdles: Legislation and government orders impinging on agricultural marketing should be constantly reviewed and amended to meet exigencies.

   f. Encouragement to adherence to standards and grades: In order to make this possible, an awareness campaign should be launched, and facilities should be created for examining standards and sorting out products according to well established grades.

5. Crop insurance: In India where there is wide volatility in crop output due to natural disasters, crop insurance should be given due priority. Unfortunately, this is a much neglected aspect in the country. The nature of agricultural risk, status of crop insurance, and measures to improve performance must be addressed properly to support IFS.

पशु आहार में यूरिया: प्रोटीन का एक स्रोत

डॉ नृपेंद्र सिंह1, डॉ दिनेश कुमार यादव 2, डॉ विभा यादव3

1. एम. वी. एस सी स्कॉलर पशु शरीर रचना एवं उत्तक विज्ञान विभाग
2. पी. एच डी स्कॉलर पशु औषधि विज्ञान विभाग
3. सहायक प्राध्यापक पशु सूक्ष्म जीव विज्ञान विभाग

पशु चिकित्सा एवं पशुपालन महाविद्यालय आचार्य नरेंद्र देव कृषि एवं प्रौद्योगिकी विश्वविद्यालय कुमारगंज अयोध्या, उत्तरप्रदेश

पशुपालक का %0 प्रतिशत व्यय पशुओं के आहार पर खर्च होता हैं। पशुओं के स्वास्थ्य और उत्पादन के लिए एक अच्छे पशु आहार और हरे चारे की आवश्यकता पड़ती हैं, लेकिन हरा चारा पूरे वर्ष उपलब्ध नहीं होता है परन्तु पशुओं के आहार में प्रोटीन की प्रर्याप्त मात्रा उपलब्ध करायी जा सकती है अतः पशुओं को सूखे चारे के साथ प्रोटीन स्रोत भी देने चाहिए जो मुख्यतः चुरी, चोकर, खलिया और यूरिया स्रोतों द्वारा मिलते हैं। यूरिया गैर–प्रोटीन नाइट्रोजन यौगिक है। यूरिया शुष्क पदार्थ के उपयोग के लिए आवश्यक अतिरिक्त नाइट्रोजन प्रदान करता है। पर्याप्त मात्रा में अमोनिया को रुमेन में बनाए रखने के लिए नाइट्रोजन होना चाहिए। यूरिया में लगभग 46 प्रतिशत नाइट्रोजन नाइट्रोजन होता है। एक किलोग्राम यूरिया में %–8 किलोग्राम खली के बराबर नाइट्रोजन होती है। मवेशी और अन्य जुगाली करने वाले पशुओं में अमोनिया और कार्बन डाइऑक्साइड के उत्पादन के माध्यम से यूरिया को प्रोटीन में परिवर्तित करते हैं यूरिया भूसे की पौष्टिकता, स्वाद और पाचनशक्ति को बढ़ाता है।

पशुओं को यूरिया खिलाने की विधियों:–

1. **दाने के साथ यूरिया खिलाना –** इस विधि में 100 किलोग्राम दाने के साथ 1 किलोग्राम यूरिया खिलाते हैं । पशुओं को खिलाने से पहले दाना और यूरिया को भिगो कर खिलाना चाहिए । यूरिया की अधिकतम मात्रा पशुओं को दाने का 2 प्रतिशत तक खिला सकते हैं ।
2. यूरिया और गुड़ का घोल बना कर इस विधि में 150 से 250 ग्राम यूरिया और 250 ग्राम गुड़ दोनों को पानी में अच्छी तरह मिला कर चारे को उपचारित करते हैं । यह घोल 10 किलो चारे के लिए उपयोगी हैं ।
3. **यूरिया द्वारा चारे को उपचारित करना –** इस विधि में 4 किलोग्राम यूरिया 50 लीटर पानी में घोल बनाकर 100 किलोग्राम चारे को उपचारित करते हैं तथा यूरिया घोल का चारे पर अच्छी तरह छिड़काव करके उसके ऊपर वापिस 100 किलो चारे की सतह बनाकर उसके ऊपर वापिस 4 किलो यूरिया का घोल का छिड़काव करते हैं, फिर इस उपचारित चारे के ढेर को प्लास्टिक की चादर ढक देते हैं, यह उपचारित चारा 20–25 दिन में पशुओं के खाने के लिए काम आने लग जाता हैं । यह उपचारित चारा खिलाने से पहले चारे को खुली हवा में फैलाना चाहिए जिससे यूरिया की गंध निकल जाये ।
4. **यूरिया – शीरा तरल मिश्रण–** इस विधि में 2.5 भाग यूरिया, 25 भाग पानी, 1 भाग नमक, 2 भाग खनिज लवण 92 भाग शीरा इन सब को मिला कर एक घोल बनाया जाता है जो चारे को उपचारितकरने के काम आता हैं। इस विधि से उपचारित किया गया चारा पशुओं को 1 किलोग्राम प्रति 100 किलोग्राम शरीर भार के अनुसार दिया जाता हैं।
5. **यूरिया–शीरा खनिज लवण ब्लॉक –** ब्लॉक बनाने के लिए 40 प्रतिशत शीरा 12 प्रतिशत यूरिया, 5 प्रतिशत नमक, 6 प्रतिशत खनिज लवण 4 प्रतिशत कैल्सियम आक्साइड के सब मिश्रण को धीरे–धीरेमिलाया जाता हैं । फिर इस को लकड़ी या धातु से बने साँचो में प्लास्टिक बिछाकर उसमें मिश्रण डाल कर ईंट का रूप दिया जाता हैं । यह ईंटे 24 घंटे में तैयार हो जाती हैं जो पशुओं को खिलाने के काम आती है ।

विभिन्न पशुओं को यूरिया की मात्रा :–

- भेड़ और बकरियों को यूरिया की मात्रा सूखा चारे का एक प्रतिशत देना चाहिए । गाय और भैंस को कुल प्रोटीन का 1 बटा 3 भाग यूरिया के रूप में देना चाहिए ।
- दुधारू गाय यदि 20 लीटर से कम दूध दे रही हैं तो उसको यूरिया कुल दाने का 2 प्रतिशत देते हैं । यदि दुधारू गाय 20 लीटर से अधिक दूध दे रही हैं तो उसको यूरिया नहीं खिलाना चाहिए क्योंकि यूरिया का सिन्धिसिस क्रिया नहीं होती है।
- हीफर, बुल और कम उत्पादन वाले पशुओं को यूरिया दाने का 1.5 से 20 प्रतिशत खिलाना चाहिए।

यूरिया खिलाने के दौरान सावधानियाँ:–

- यूरिया को अच्छी तरह मिला कर खिलाना चाहिए ।
- यूरिया हमेशा प्रोढ़ पशुओं को खिलाना चाहिए, छोटे पशुओं को नही
- यूरिया की सिफारिश मात्रा से अधिक कभी नहीं खिलानी चाहिए ।
- छः महीने से कम बछड़े व बछड़ियों को यूरिया नहीं खिलाना चाहिए ।
- बीमार पशुओं को भी यूरिया नहीं खिलाना चाहिए ।
- यूरिया का घोल हमेशा प्रयोग के समय ही बनाये । पहले बना कर नहीं रखना चाहिए क्योंकि पहले बनाया गया यूरिया के घोल में विषाक्त गुण आ जाते जो पशुओं को नुकसानदायक होते हैं ।
- गर्भित पशुओं को यूरिया नहीं खिलाना चाहिए ।
- यूरिया खिलाए हुये पशुओं को पानी की उचित मात्रा समय पर उपलब्ध करानी चाहिए क्योंकि यूरिया जल उपयोग क्षमता को बढ़ाता हैं ।

पशुओं के लिए अजोला ! एक सदाबहार हरा चारा

डॉ आनंद जैन, डॉ आदित्य मिश्रा, डॉ दीपिका डी. सीजर, डॉ संजू मंडल एवं डॉ पूनम यादव
पशु शरीर क्रिया और जैव रसायन विभाग
पशु चिकित्सा और पशु पालन महाविद्यालय जबलपुर –482001 (म.प्र.)

अजोला परिचय

दुग्ध के लिए बढती हुई मांग, पशुपालन व्यवसाय को लाभदायक बनाने की नयी संभावनाओं का सृजन कर रही है । ठीक इसी समय हरे चारे की उपलब्धता में निरंतर कमी परिलक्षित हो रही है । वनों एवं चारागाहों का क्षेत्रफल घाट रहा है । साथ ही साथ फसल प्रति उत्पादों में भी कमी आ रही है जो की अन्यथा पशु आहार के रूप में उपयोग किया जाता रहा है । हरे चारे की इस पूर्ति व्यवसायिक पशु आहार से की जा रही है । जिसके कारण दुग्ध के उत्पादन लागत में वृधि हो रही है ।

अजोला एक तैरती हुई फर्न है जो शैवाल से मिलती–जुलती है। यह सामान्यतः उथले पानी में उगाई जाती है। यह तेजी से बढ़ती है। यह बहुत अच्छा जैव उर्वरकता का स्त्रोत है। इस फर्न का रंग गहरा लाल या कत्थाई होता है। धान के खेतों में यह अक्सर दिखाई देती है। छोटे–छोटे पोखर या तालाबों में जहां पानी एकत्रित होता है वहां पानी की सतह पर यह दिखाई देती है।

अजोला उत्पादन की विधि

मैदानी स्तर पर अजोला पिट का निर्माण एक पेड की छांव के नीचे 10x5x0.80 गड्ढा खोदकर जिसके किनारे पर ईंट रखें। गड्ढे में पन्नी बिछाकर 4.5 कि.ग्रा. गोबर की खाद में 10 लीटर पानी का घोल तैयार करें तथा इसे पालीथीन के ऊपर बिछाएं । इसमें और पानी मिलाए जिससे यह % से 8 इन्च का घोल हो जाए। इसमें 1 कि.ग्रा. फ्रेश अजोला कल्चर डालें ।

अजोला पिट में 2 से 3 दिन में पूर्ण अजोला दिखने लगेगा। %वें दिन से 1 से 1.5 कि.ग्रा. अजोला प्राप्त हो सकेगा । इस उपलब्ध अजोला को पशु को देने से स्वास्थ्य एवं उत्पादन में बढोतरी हो सकेगी। इसका उपयोग करके पशुपालक अपनी आय दोगुनी से भी ज्यादा कर सकते है ।

पानी से भरे खेत (2 से 4 इंच) में 10 टन ताजा एजोला को डाल दिया जाता है। इसके साथ ही इसके ऊपर लगभग 40 कि0ग्रा0 सुपर फास्फेट का छिड़काव भी कर दिया जाता है। इसकी वृद्धि के लिये 30 से 35 डिग्री सेल्सियस का तापक्रम अनुकूल होता है। पानी के पोखर या लोहे के ट्रे में एजोला कल्चर बनाया जा सकता है। पानी की पोखर या लोहे के ट्रे में 5 से % से.मी. पानी भर देवें। उसमें 100 से 400 ग्राम कल्चर प्रतिवर्ग मीटर की दर से पानी में मिला देवें। सही स्थिति रहने पर एजोला कल्चर बहुत तेज गति से बढ़ता है और 3–4 दिन में ही दुगना हो जाता है। एजोला कल्चर डालने के बाद दूसरे दिन से ही एक ट्रे या पोखर में एजोला की मोटी परत जमना शुरू हो जाती है जो नत्रजन स्थिरीकरण का कार्य करती है।

अजोला किस तरह से पशुओ में फायदा करता है

अजोला पानी में पनपने वाला छोटे बारीक पौधो के जाति का होता है। एजोला की पंखुड़ियो में एनाबिना नामक नील हरित काई के जाति का एक सूक्ष्मजीव होता है जो सूर्य के प्रकाश में वायुमण्डलीय नत्रजन का यौगिकीकरण करता है और हरे खाद की तरह फसल को नत्रजन की पूर्ति करता है। अजोला की विशेषता यह है कि यह अनुकूल वातावरण में 5–6 दिनों में ही इसकी पैदावार दोगुनी हो जाती है। अजोला में कई तरह के कार्बनिक पदार्थ होते हैं जो भूमि की ऊर्वरा शक्ति बढ़ाते हुये अधिक पैदावार देते है।

पशुओं के लिए पौष्टिक आहारके रूप मे केसे उपयोग करे –

अजोला जैव उर्वरक के रूप मे बहुत अच्छा कार्य करता है। ये कुक्कुट, मछली और पशुओं के चारे के काम में भी आता है। इससे बायोडीजल तैयार किया जाता है। हमारे देश में तीव्र गति से बढती जनसंख्या के पोषण के लिए दूध की मांग दिन प्रति दिन बढती जा रही है।दुधारू पशुओं के पोषण तथा स्वास्थ्य रखरखाव में हरा चारा एक महत्वपूर्ण घटक है। अजोला पशुओं के लिए पौष्टिक आहार है। पशुओं को खिलाने से उनका दुग्ध उत्पादन बढ़ जाता है। पशुओं को चारा देने से पूर्व अजोला को अच्छी तरह धोना चाहिए, क्योंकि गोबर मिला होने के कारण प्रायः पशुओं को इसकी गंध पसंद नही होती है।

अजोला की विशेषताए क्या है

अजोला सस्ता, सुपाच्य, पौष्टिक, पूरक पशु आहार है। इसे खिलाने से पशुओं के दूध में वसा व वसा रहित पदार्थ सामान्य आहार खाने वाले पशुओं की अपेक्षा अधिक पाई जाती हैं। अजोला में मुख्य रूप से 25 प्रतिशत प्रोटीन पाया जाता है, इसके अतिरिक्त इसमें अमीनो एसिड, विटामिन (विटामिन ए, बी–12 तथा कैरोटीन) प्रचुर मात्रा में पाया जाता है।

अजोला से पशुओं के शरीर में कई तत्वों जैसे कैल्शियम, फॉस्फोरस, लोहे की आवश्यकता की पूर्ति होती है जिससे पशुओं का शारीरिक विकास अच्छा होता है। यह गाय, भैंस, भेड़, बकरियों , मुर्गियों आदि के लिए एक आदर्श चारा सिद्ध हो रहा है। दुधारू पशुओं को यदि उनके दैनिक आहार के साथ 1.5 से 2 किग्रा. अजोला प्रतिदिन दिया जाता है तो उनके दुग्ध उत्पादन में 15 से 20 प्रतिशत वृद्धि संभव है।

अजोला उत्पादन के दौरान ध्यान रखने योग्य बातें

1. अजोला की तेज़ बढ़त और दुगुना होने का न्यूनतम समय बनाये रखने हेतु यह आवश्यक हो जाता है कि अजोला को प्रतिदिन उपयोग के लिए बाहर निकाला जाये (लगभग 200 ग्राम प्रति वर्ग मीटर के मान से)।
2. समय– समय पर गाय का गोबर एवं सुपर फॉस्फेट डालते रहना चाहिए ताकि फ़र्न तीव्र गति से विकसित होता रहे ।
3. प्रति 10 दिनों के अंतराल में एक बार अजोला तैयार करने की टंकी से 25 – 30 प्रतिशत पानी, ताज़े पानी से बदल देना चाहिए ताकि नाइट्रोजन की अधिकता होने से बचाया जा सके ।
4. प्रति 6 माह के अंतराल में, एक बार, अजोला तैयार करने की टंकी को पूरी तरह से खाली कर साफ़ करना चाहिए तथा नए सिरे से पानी, गोबर एवं अजोला कल्चर डालना चाहिए ।
5. अजोला का उपयोग करने से पहले ताजे, साफ़ पानी से अच्छे से धोना चाहिए ताकि गोबर की गंध निकल जाये ।

यूरिया उपचार द्वारा सूखे चारे की गुणवत्ता बढ़ाना

डॉ. मनीष जाटव, डॉ. प्रीति वर्मा

डॉ. अर्चना1, डॉ. विजय कुमार गोंड2 एवं डॉ. दीपिका डायना जैसी3

1 बिहार वेटरनरी कॉलेज , बिहार एनिमल साइंस यूनिवर्सिटी पटना (बिहार)

2 पशु उत्पादन शोध संस्थान, पूसा, समस्तीपुर (बिहार)

3 पशुचिकित्सा एवं पशुपालन महाविद्यालय, जबलपुर (म. प्र.)

भारतीय अर्थव्यवस्था की बुनियाद कृषि है तथा कृषि के साथ पशुपालन हमारे यहां कृषकों का प्रमुख व्यवसाय है, पशु खेती बाड़ी के काम में किसानों का हाथ बटाते हैं एवं उनके परिवार के लिए मांस दूध दही घी मक्खन आदि मुहैया कराते हैं एक तरह से यह पशु किसान के लिए जमा पूंजी है, पशुपालन व्यवसाय में अच्छा मुनाफा पाने के लिए जरूरी है कि पशु को और चारा उपलब्ध कराया जाए ।

मौजूदा वक्त में कोरोना वायरस के वैश्विक संकट के कारण हमारे कृषक हरे चारे का उत्पादन नहीं कर पाए लिहाजा अपने पशुओं को मजबूरी में निकृष्ट स्वादहीन सूखा चारा खिलाते हैं जिससे पशु का पेट तो भर जाता है पर इस चारे में पौष्टिक तत्व जैसे के उर्जा प्रोटीन एवं खनिज तत्व एवं विटामिन की कमी होती है इस कारण पशु के बढ़वार, उत्पादन क्षमता एवं पशु की प्रजनन क्षमता दिन–बदिन कम होती जाती है और किसान को समुचित लाभ नहीं मिल पाता है ऐसी परिस्थिति में किसान भाई सूखे चारे को यूरिया से उपचारित करके निहायत ही कम खर्च में चारे की गुणवत्ता बढ़ा सकते हैं एवं लंबे समय तक चारे को महफूज रख सकते हैं ।

यूरिया उपचारित चारा बनाने का खास तरीका होता है यूरिया का घोल बनाकर इसको सूखे चारे के ऊपर छिड़का जाता है; यूरिया का घोल बनाने का तरीका बिल्कुल आसान है–

अगर 100 के.जी चारे को उपचारित करना है तो उसके लिए 4 के.जी यूरिया की आवश्यकता होगी ।

इस 4 के.जी यूरिया को तकरीबन 40– 50 लीटर पानी में घोल लेना है यूरिया या पानी नापने के लिए किसान भाई घर में पड़े तेल घी के डब्बे के खाली पड़े डब्बे इस्तेमाल कर सकते हैं एक बार नाप के योग्य डब्बे बना ले फिर हर दफा जब यूरिया का घोल बनाना हो तो उसी डब्बे का इस्तेमाल करें ।

आप जिस बर्तन में घोल बनाना चाहते हैं पहले उसमें 4 के.जी यूरिया डालें फिर थोड़ा सा पानी डालें और लकड़ी की साफ छड़ी से घोलना शुरू कर दें, पानी आहिस्ता आहिस्ता बढ़ाते जाए इस तरह की सारा नापा हुआ पानी इस्तेमाल हो जाए इस तरह यह यूरिया का घोल तैयार है ।

अब इस घोल को छिड़कने के लिए एक साफ–सुथरे जगह पर सूखे चारे (पराली/पुआल/तूड़ी) की 1 इंच मोटी बिछा दें उस पर किसी भी बर्तन के जरिए यूरिया घोल का छिड़काव करें बिल्कुल वैसे ही जैसे धूल बैठाने के लिए जमीन पर पानी का छिड़काव किया जाता है उसके बाद बाया हाथ पांव या हाथ की मदद से वालों को वालों को पुआल को अच्छी तरह दबाएं ।

फिर इस घोल छिड़की हुई तह पर दूसरी उतनी ही मोटी तह बिछाएं उस पर भी उसी तरह यूरिया का घोल छिड़के और उसी तरह तह को दबाएं और यह प्रक्रिया तब तक करें जब तक पूरा घोल और पूरा हुआ सूखा चारा इस्तेमाल ना हो जाए ।

छिड़काव के बाद पुआल को एक ढेर की शक्ल बना दें और उस ढेर को सील बंद कर दें सील बंद करने के लिए बड़े

आकार प्लास्टिक का इस्तेमाल करें, प्लास्टिक पुआल के ढेर पर पूरा फैला दें और प्लास्टिक के सिरे को चारों तरफ से मिट्टी से दबा दें; एहतियात से इस्तेमाल करें तो यही प्लास्टिक हर बार इस्तेमाल कर सकते हैं जब भी जब भी दोबारा यूरिया उपचारित चारा बनाना हो इस मकसद के लिए खाद की बोरी के अंदर वाली पॉलिथीन का भी इस्तेमाल कर सकते हैं अगर पॉलिथीन उपलब्ध ना हो तो यूरिया उपचारित की ढेर पर सरकंडे की तह बिछा दें और इस पर मिट्टी का लेप कर दें इस लिपि मिट्टी पर कहीं–कहीं दरार पड़ जाती है । ऐसी जगह पर फौरन मरम्मत कर दें ताकि बारिश का पानी नुकसान न पहुंचा सके; यह सब इसलिए किया जाता है ताकि अमोनिया गैस ज्यादा से ज्यादा अंदर ही रहै और अपना पूरा असर दिखा सके ।

यूरिया उपचारित चारा इस्तेमाल के लिए गर्मी के मौसम में छिड़काव के एक माह बाद और जाड़े में छिड़काव के डेढ़ माह बाद निकाली जा सकती है ।

ढेरी खुलने पर अमोनिया की अमोनिया की तेज गंध महसूस होती है उससे घबराने की जरूरत नहीं है, यह चारा पशु के खाने के लिए बिल्कुल सुरक्षित है । इस यूरिया उपचारित को चारे को आप बिल्कुल हरे चारे के साथ मिलाकर पशु को खिला सकते हैं ।

आप चाहें तो पुआल को आप कतर भी सकते हैं यह भुरभुरी भुरभुरी हो जाती है जो आसानी सेकट जाती है, यूरिया उपचारित चारा आपके पौष्टिक पौष्टिक चारे की कमी को पूरा करेगी और आपके पशुओं की सेहत बेहतर हो जाएगी, यह यूरिया उपचारित आसानी से पच जात है, दूध बढ़ाता है और आपका खर्च भी कम हो जाता है लिहाजा आप का मुनाफा बढ़ जाता है।

किसान भाई आपको चाहिए कि यूरिया उपचार के इस तरीके को अपनाकर इसका पूरा पूरा फायदा उठाएं मांस और दूध का ज्यादा से ज्यादा उत्पादन करें और अपनी आर्थिक स्थिति सुदृढ़ करें ।

पशुओ मे खुरपका-मुंह पका रोग की पहचान एवं उपचार

जय श्री जाखड़1*, नीरज कुमार2*, सचिन पाटीदार3, एवं मनीष कुमार वर्मा4
1,2 पशु विकृत्ति विज्ञान विभाग, 3 पशु परजीवी विज्ञान विभाग, 4 पशु भेषज एवं विष विज्ञान विभाग
गोविंद बल्लभ पंत कृषि एवं प्रौद्योगिकी विश्वविद्यालय, पंतनगर, उधम सिंह नगर, उत्तराखंड

परिचय:-

मुंहपका-खुरपका रोग (FMD) विभक्त खुर/दो खुरों वाले पशुओं जैसे गाय, भैंस, भेंड, बकरी, हिरन, भेड़, सुअर तथा अन्य जंगली पशुओ में होने वाला एक अत्यंत संक्रामक एवं घातक विषाणु जनित वायु कोशीय रोग है । गायों और भैंसों को खुरपका रोग काफ़ी प्रभावित करता है । यह काफी तेज़ी से फैलने वाली एक संक्रामक बीमारी है । इसे प्रभावित होने वाले जानवर मे अत्याधिक तेज बुखार (104-106^{O}F), के साथ मुँह और खुरों पर छाले और घाव बन जाते हैं । रोग के असर के कारण कुछ जानवर स्थायी रूप से लंगड़े भी हो सकते हैं, जिस कारण वे खेती में इस्तेमाल के लायक नहीं रह जाते । इसका संक्रमण होने के कारण गायों का गर्भपात हो सकता है और समय पर इलाज नहीं होने के कारण युवा बछड़े मर भी सकते हैं । इस रोग से संक्रमित मवेशियों के दूध उत्पादन मे अचानक से गिरावट आ जाती हैं । हालांकि ऐसे मवेशियों का दूध अनुपयोगी हो जाता है । अतः इस रोग के कारण कृषक को बहुत घन की हानि होती है और कार्य भी बाधित हो जाते हैं । ऐसे में इस बीमारी के रोकथाम के लिए गायों और भैंसों का टीकाकरण बहुत महत्वपूर्ण है ।

रोग के कारण :-

यह रोग पशुओं को एक बहुत ही छोटे आँख से न दिख पाने वाले विषाणु या वाइरस द्वारा होता है । जिसे मुहपका खुरपका विषाणु कहते हैं । इस विषाणु के अनेक प्रकार तथा उप-प्रकार है, इनकी प्रमुख किस्मों में ओ.ए.सी. एशिया 1, एशिया-2, एशिया 3, सैट 1, सैट 2, सैट 3 तथा इनकी 14 उप किस्में शामिल है। हमारे देश में यह रोग मुख्यतः ओ.ए.सी. तथा एशिया-1 प्रकार के विषाणुओं द्वारा होता है ।

रोग के फैलने के कारण :-

ये रोग मुख्यतः संक्रमित जानवर के विभिन्न स्त्राव और उत्सर्जित द्रव जैसे लार, गोबर, दूध के साथ सीधे संपर्क मे आने, दाना, पानी, घास, बर्तन, दूध निकालने वाले व्यक्ति के हाथो से और हवा से फैलता है। इस स्त्राव मे विषाणु बहुत अधिक संख्या मे होते हैं और स्वस्थ जानवर के शरीर मे मुँहऔर नाक के माध्यम से प्रवेश कर जाते हैं। ये रोगसंक्रमित जानवरो कोस्वस्थ जानवरो के एक साथ बाड़े मे रखने से, एक ही बर्तन से खाना खाने और पानी पीने से, एक दूसरे का झूठा चारा खाने से फैलता हैं। ये विषाणु खुले में घास, चारा, तथा फर्श पर कई महीनों तक जीवित रह सकते हैं लेकिन गर्मी के मौसम में यह बहुत जल्दी नष्ट हो जाते हैं। विषाणु जीम, मुंह, आंत, खुरों के बीच की जगह, थनों तथा घाव आदि के द्वारा स्वस्थ पशु के रक्त में पहुंचते हैं तथा लगभग 4-5 दिनों के अंदर उसमें बीमारी के लक्षण पैदा करते हैं।नम-वातावरण, पशु की आन्तरिक कमजोरी, पशुओं तथा लोगों का एक स्थान से दूसरे स्थान पर आवागमन तथा नजदीकी क्षेत्र में रोग का प्रकोप इस बीमारी को फैलाने में सहायक कारक है। यह रोग रोग किसी भी उम्र की गायें एवं उनके बच्चों में हो सकता है। इसके लिए कोई भी मौसम निश्चित नहीं है अर्थात यह रोग किसी भी समय हो सकता है।

रोग के लक्षण:-

इस रोगमेंहोने पर पशु को तेज बुखार (104-106^{O}F) होता है। बीमार पशु के मुँहमे मुख्यत जीभ के उपर, होठो के अंदर,

मसूड़ो पर साथ ही खुरो के बीच की जगह पर छोटे छोटे छाले बन जाते है।फिर धीरे–धीरे ये छाले आपस में मिलकर बड़ा छाला बनाते हैं। समय पाकर यह छाले फूट जाते हैं और उनमें जख्म हो जाते हैं। मुँह मे छाले हो जाने की वजह से पशु जुगाली बन्द कर देता हैं और खाना पीना छोर देता है,मुँह से निरंतर लार गिरती रहती हैं साथ ही मुँह चलाने पर चाप चाप की आवाज़ भी सुनाई देती हैं।पशु सुस्त पड़ जाते और कुछ खाते–पीते नहीं है। खुर में जख्म होने की वजह से पशु लंगड़ाकर चलता है।दुधारू पशुओं में दूध का उत्पादन 80% तककम होजाता है। पशु कमजोर होने लगते हैं। प्रभावित पशु स्वस्थ्य होने के उपरान्त भी महीनों तक और कई बार जीवनपर्यन्त हांफते रहता है, शरीर के रोयें (बाल) तथा खुर बहुत बढ़ जाते हैं, गर्भवती पशुओं में गर्भपात की संभावना बनी रहती है ।

रोग का उपचार

इस रोग का कोई निश्चित उपचार नहीं है अतः रोगी पशु में सेकेन्डरी संक्रमण को रोकने के लिए उसे पशु चिकित्सक की सलाह पर एंटीबायोटिक के टीके लगाए जाते हैं अथवा रोगग्रस्त पशु के पैर को नीम एवं पीपल के छाल का काढ़ा बना कर दिन में दो से तीन बार धोना चाहिए । प्रभावित पैरों को फिनाइल–युक्त पानी से दिन में दो–तीन बार घोकर मक्खी को दूर रखने वाली मलहम का प्रयोग करना चाहिए । मुँह के छाले को 1 प्रतिशत फिटकरी के पानी में घोलकर दिन में तीन बार धोना चाहिए । मुंह में बोरो–गिलिसरीन तथा खुरों में किसी एंटी सेप्टिक लोशन का प्रयोग किया जा सकता है । इस दौरान पशुओं को मुलायम एवं सुपाच्य भोजन दिया जाना चाहिए । पशु चिकित्सक के परामर्श पर दवा देनी चाहिए ।

रोग का बचाव

टीकाकरण ही इस बीमारी से बचाव के लिए सर्वोत्तम है इसलिए पशुओं को पोलीवेलेंट वेक्सीन के वर्ष में दो बार टीके अवश्य लगवाने चाहिए। बच्छे/बच्छियां में पहला टीका 1 माह की आयु में, दूसरा तीसरे माह की आयु तथा तीसरा 6 माह की उम्र में और उसके बाद नियमित छः माह के अन्तराल पर लगवाते रहना चाहिए। बीमारी हो जाने पर रोग ग्रस्त पशु को स्वस्थ पशुओं से अलग कर देना चाहिए । बीमार पशुओं की देखभाल करने वाले व्यक्ति को भी स्वस्थ पशुओं के बाड़े से दूर रहना चाहिए । बीमार पशुओं के आवागमन पर रोक लगा देना चाहिए । रोग से प्रभावित क्षेत्र से पशु नहीं खरीदना चाहिए । पशुशाला को साफ–सुथरा रखना चाहिए । संक्रमित पशुओं को पूर्ण आहार देना चाहिए । जिससे खनिज एवं विटामीन की मात्रा पूर्ण रूप से मिलती रहे । इस बीमारी से मरे पशु के शव को खुला न छोड़कर जमीन में गहरे गड्ढे मे गाढ़ना चाहिए । समय–समय पर पशु चिकित्सक का परामर्श लेते रहना चाहिए ।

हालांकि गाय में इस रोग से मान्यता नहीं होती फिर मी दुधारू पशु सूख जाते कोई नहीं है इसलिए रोग जुलाई 2010 ऋ% होने से पहले ही उसके टीके लगवा लेना फायदेमन्द है ।

शरद ऋतु में बकरियों में होने वाले प्रमुख रोग तथा उनकी रोकथाम

डॉ. आनंद कुमार सिंह एवं डॉ. दिव्या पाठक
पशु चिकित्सा एवं औषधि विज्ञान विभाग, पंत नगर

बकरियों को स्वस्थ रखकर बीमारियों से उनका बचाव करना रक्षा की पहली पंक्ति है । पशुओं को स्वस्थ रखने के लिए एक आदर्श प्रबंधन कार्यक्रम आवश्यक है। पशुपालकों को पशुओं का बारीक़ी से निरीक्षण करना चाहिए और रोगो के नैदानिक संकेतो को पहचान कर झुण्ड का आकलन करना चाहिए ।

एक अस्वस्थ जानवर झुण्ड के बाकी पशुओं से अलग तथा अन्य पशुओं से असामान्य व्यवहार प्रदर्शित करता है । अन्य महत्वपूर्ण प्रबंधन कार्य जैसे वेंटीलेटर (एयर टर्नओवर), उचित स्टॉक डेंसिटी (जानवर घनत्व दर) तथा अच्छा पोषण कार्यक्रम (बैलेंस्ड राशन) भी रोगो की रोकथाम में सहायक है। उच्च विशिष्टरोग जैसे की ब्लैक लेग, टिटनेस तथा अन्य क्लोस्ट्रिडियल रोगो के लिए टीकाकरण कार्यक्रम के द्वारा सुरक्षा प्रदान कर सकते हैं। यह टीके सस्ते है और ठीक से उपयोग किये जाने पर नुकसान को रोकने में एक बहुत प्रभावशाली माध्यम है ।

शरद ऋतु में बकरियों का ठण्ड से बचाव करना चाहिए अन्यथा वे हाइपोथर्मिया का शिकार हो सकते है । हाइपोथर्मिया वह अवस्था है जिसमें शरीर का तापमान उस बिंदु तक जाता है जहां जीवन खतरे में हो सकता है । मुख्तयः बकरी के शावक इससे ज्यादा प्रभावित होते है। इसे रोकने का सबसे अच्छा तरीका एक अच्छा गर्म शुष्क आश्रय क्षेत्र है, जिसमें प्रसव हो सके तथा उन्हें कोलोस्ट्रम दिया जाएं ।

शवास सम्बन्धी समस्याएं : शवास संक्रमण या निमोनिया बकरियों में एक गंभीर बीमारी है । विभिन्न वायरस तथा बैक्टीरिया एवं वीनिंग, मौसम में परिवर्तन, ट्रांसपोर्ट, बुख़ार, झुण्ड आवास में हवा की गुणवत्ता इत्यादि तनाव के परिणाम स्वरूप फेफड़ो को संक्रमित करते है। निमोनिया के नैदानिक संकेतो में शामिल है: बुखार, खांसी, सांस लेने में तकलीफ, एनोरेक्सिया (भूख न लगना) तथा अवसाद्।

निमोनिया के इलाज के लिए एंटी बायोटिक दवाओं का प्रयोग कारगर है, चूंकि निमोनिया के विभिन्न प्रकार है इसलिए इसकी पहचान महत्वपूर्ण है, जिससे प्रभावी उपचार किया जा सके। निमोनिया की घटना को कम करने के लिए स्वछता और झुण्ड आवास में वायु गुणवत्ता महत्वपूर्ण है । कोई भी पर्यावरणीय स्थिति फेफड़ो में परेशानी कर संक्रामक एजेंटो को मौका देती है जो की पशुओं को प्रभावित कर सकती है । अच्छा पोषण, शुद्ध पानी, परिवहन तनावों में कमी तथा प्रतिरोधक क्षमता की वृद्धि के लिए ट्रेस खनिजों का उपयोग करना चाहिए ।

आंतरिक तथा बाहरी परजीवी : बकरियों के स्वास्थ्य के लिए परजीवी एक महत्वपूर्ण खतरा है। यह पशु के स्वास्थ्य को नुकसान पहुंचाते है और उनकी प्रजनन प्रदर्शन, विकास दर में कमी, मांस तथा उत्पादन में कमी आ जाती है । परजीवी से संक्रमित पशु के नैदानिक संकेत है: दस्त, कम वजन, भूख में क्मी इत्यादि । परजीवी पशुओं की संवेदना अर्थात रोग प्रतिरोधक क्षमता को प्रभावित करता है । आमतौर पर बकरिया आंतरिक परजीवियों के लिए अधिक संवेदनशील होती है ।

आंतरिक परजीवी: कई प्रकार के आंतरिक परजीवी बकरियों को प्रभावित करते है । अत्यधिक उच्च परजीवी स्तर अक्सर पशु के स्वास्थ्य के लिए हानिकारक होते है। आंतरिक परजीवी में मुख्यत: राउंड वर्म जैसे : हेमौंकसकंटोर्टस, ट्राइकोस्टरोंगाइल हैजो की बकरियों की छोटी आंत में रहते है, बकरियों को प्रभावित करने वाला सबसे खतरनाक परजीवी (राउंडवर्म) हैं हेमौंकसजि से पॉलवर्म भी कहा जाता है । यह एक रक्त स्त्रावी परजीवी है। नैदानिक संकेतो में अनिमिया (रक्त की कमी), प्रोटीन

की कमी तथा मृत्यु देखी जाती है । इससे प्रभावित पशु सुस्त तथा कमजोर हो जाता है और अक्सर झुण्ड से अलग रहता है । निचले जबड़े में सूजन/बोतल जॉ भी इसका एक मुख्यल क्षण है । टेपवर्म के कारण भी वजन घट सकता है तथा आंत संबंधी परेशानिया भी होती है । टेपवर्म की पहचान के लिए नियमित मल की जांच (मल में पीले सफ़ेद सेगमेंट) की जा सकती है । बकरी के शावकों में यह सबसे आम है ।

बाहरी परजीवी : बकरियों में विशेष रूप से सर्दियों में बंद कोठार में रखा जाना आम हैं । बाहरी परजीवी खून चूसते है और त्वचा पर अंडे देते है । इनके रोकथाम के लिए विशिष्ट : कीटनाशकों का प्रयोग किया जाता है ।

प्रेगनेंसी टोक्सिमिआ/ केटोसिस : यह मुख्यत : वसा या पतले पशुओं में जिनमें दो या अधिक भ्रूण होते है उनमें पाई जाती है। यह स्थिति तब विकसित होती है जब पशु में बढ़ते भ्रूण और अपने दोनों के शरीर की आवश्यकता को पूरी करने के लिए ऊर्जा (ग्लूकोस) की कमी हो जाती है । प्रारंभिक लक्षण जैसे बढ़ी हुई भूख (पोषण तत्वों की बढ़ती जरूरतों की भरपाई के लिए) शामिल है। कंसन्ट्रेट फीड प्रदान न करना भी एक कारण है। ऐसी अवस्था में शरीर वसा को मेटाबोला इस करता है, खुद की पोषक अवक्षेक्ताओं और कीटो न बॉडीज का उत्पादन करता है जो उच्चस्तर में खतरनाक हो सकता है। गर्भावस्था में बढ़ते भ्रूण पेट में अधिक जगह लेने लगते है जो माता की पर्याप्त रूप से खाने में शारीरिक रूप से असक्षम बना देती है ।

इसकी रोकथाम के लिए प्रजनन तथा गर्भाधारण के समय बकरियों का वजन प्रबंधन आवश्यक है । ऊर्जा घनत्व में वृद्धि के साथ आखिरी तिमाही में अनाज खिलाना चाहिए ।

सारांश

बकरियों के स्वास्थ्य को बनाये रखने के लिए

1) मुख्य रूप से एक टीकाकरण कार्यक्रम लागू करें ।
2) एक प्रभावी परजीवी नियंत्रण कार्यक्रम पर विचार करें ।
3) नए आयें पशु को कुछ दिन झुण्ड से अलग रखें ।
4) पर्याप्त पोषण स्वच्छ तथा अच्छे हवादार आवास बनाये रखें ।
5) बीमारियों के रोकथाम तथा इलाज के लिए पशु चिकित्सक से संपर्क बनाये रखे ।

ढेलेदार त्वचा रोग (एलएसडी) : मवेशियों के लिए एक उभरता हुआ खतरा

उपेंद्र1, अमित कुमार2, उमेद सिंह मेहरा2

1 सार्वजनिक स्वास्थ्य और महामारी विज्ञान विभाग, भारतीय पशुचिकित्सा अनुसंधान संस्थान, इज़्ज़तनगर, उत्तरपदेश

2 पशु मादा रोग एवं प्रसूति विभाग, भारतीय पशु चिकित्सा अनुसंधान संस्थान, इज़्ज़तनगर, उत्तरपदेश

परिचय :

ढेलेदार त्वचा रोग, विशेष रूप से एक गांठ दार रोग वायरस (एल एस डी वी) के कारण होने वाले मवेशियों की एक गांठदार स्थिति है, जिसमें बुखार, अत्यधिकलार, अत्यधिक नेत्र स्राव की विशेषता होती है, जिसके बाद ओरो–ग्रसनी क्षेत्र, थन, जननांग पर गांठदार घावों का विकास होता है और कभी–कभी घातक परिणाम में समाप्त होता है । यह पहली बार 1929 में जाम्बिया में रिपोर्ट किया गया था । इसके बाद यह अफ्रीका क्षेत्र में फैल गया, इसके बाद दुनिया के अधिकांश देशों में काटने वाले कीड़ों, झुंड में जानवरों के प्रवास आदि के माध्यम से फैल गया । विश्व पशु स्वास्थ्य संगठन के अनुसार, यह एक ध्यान देने योग्य (नोटिफिएब्ल) रोग है । यह एक ट्रांस बाउंड्री पशु रोग (टीएडी) है जो अत्यधिक संक्रामक है और राष्ट्रीय सीमाओं को पार करने और गंभीर सामाजिक–आर्थिक और सार्वजनिक स्वास्थ्य परिणामों के कारण बहुत खतरनाक बिमारी है। यह विभिन्न माध्यमों से किसानों को भारी आर्थिक नुकसान पहुंचाता है जैसे दूध उत्पादन में कमी, चमड़ी प्रभावित होने से पशुओं के मूल्य में आई कमी आदि । भारत में पहली बार 2019 में रिपोर्ट की गई और उसके बाद अब तक विनाशकारी साबित हुई है । इस रोग की रुग्णता दर 10 से 20% के बीच होती है जबकि मृत्यु दर सामान्यत: 1 से 5% के बिच में मानी जाती है ।

कारक एजेंट :

गांठदार त्वचा रोग वायरस का एक सदस्य, परिवार पॉक्स विरिडे । इसमें इसके जीनोम के रूप में होता है जो कि जटिल समरूपता वाले गैर–लिफाफा होता है । इस वायरस की सरंचना ईंट के आकार की है ।

प्रभावित जानवर :

यह मुख्य रूप से मवेशियों (गायों एवं भैंसो) को प्रभावित करता है। अफ्रीकी केप भैंस जैसे जंगली जुगाली करने वाले जानवरों को इस बीमारी का भंडार माना जाता है। विदेशी नस्ल की गाय आमतौर पर देसी गाय की तुलना में नैदानिक बीमारी के लिए अति संवेदनशील होती है । एशियाई भैंस की भी अति संवेदनशील होने की सूचना मिली है ।

जोखिम कारक :

1) पर्यावरण–वैक्टर की अधिक संख्या, वैक्टर के लिए उपयुक्त प्रजनन स्थलों की उपस्थिति (खड़े पानी और डंगहिल), टिक्स के लिए उपयुक्त घास के मैदान, मवेशी परिवहन मार्ग आदि ।
2) मौसम–उच्च तापमान और पर्यावरण की उच्च आर्द्रता अधिक वेक्टर आबादी की ओर ले जाती है जो अंततः उच्च एल एस डी मामलों की ओर ले जाती है ।
3) प्रभावित क्षेत्रों से रोग मुक्त क्षेत्रों में मवेशियों की आवाजाही–व्यापार, चराई, खानाबदोश और ट्रांसह्यूमन खेती, कानूनी और अनधिकृत ट्रांस बाउंड्री पशु आंदोलन, आयातित जानवरों के लिए परीक्षण व्यवस्था की कमी आदि ।
4) एल एस डी वी के खिलाफ कम/कोई प्रतिरक्षा नहीं–पूरी तरह से अति संवेदनशील मवेशियों की आबादी, मवेशियों को

टीका लगाया गया है लेकिन अभी तक संरक्षित नहीं किया गया है, टीकाकरण बंद हो गया है, खराब टीकाकरण कवरेज, कोई टीकाकरण रिकॉर्ड नहीं रखा गया है आदि ।

5) खेती के तरीके–पड़ोसी झुंडों के साथ संपर्क, अविश्वसनीय स्रोतों से नए जानवरों की खरीद, स्थानीय प्रजनन बैल का उपयोग, मवेशियों की नियमित आधार पर निगरानी नहीं की जाती है, साझा पशु चिकित्सा या अन्य उपकरण आदि ।

संचरण :

यह मुख्य रूप से जानवरों के बीच मच्छरों (क्यूलेक्समिरिफिसेंस और एडीजनैट्रियनस), काटने वाली मक्खियों (स्टोमोक्सिसकैल्सीट्रांस और बायोमियाफासिआटा), नरटिक (रिफिसेफलसएपेंडीकुलैटस और एंबलीओम्माहेब्रियम) आदि जैसे काटने वाले कीड़ों द्वारा यांत्रिक रूप से फैलता है । यह झुंड के बीच संक्रमित लार के द्वारा भी फैलता है । यह वीर्य में भी स्रावित होने की सूचना है; इसलिए कृत्रिम गर्भाधान में भी इस वायरस के फैलने का जोखिम है । वायरस दूध और नाक के स्राव में मौजूद होता है, और इसे फेफड़े, त्वचा, यकृत और लिम्फनोड्स से भी पुनर्प्राप्त किया जा सकता है । यह घावों के सीधे संपर्क के माध्यम से पशु संचालकों को प्रेषित हो जाता है, इस प्रकार एक जूनोटिक बीमारी (वह बिमारियां जो मनुष्यों और जानवरो में पारस्परिक फैलती है) है । गांठदार त्वचा रोग वायरस कीट वेक्टर की आवश्यकता के बिना सीधे संचरण के साथ मनुष्यों को संक्रमित करने में सक्षम है; यह संभवत: साँस द्वारा और निश्चित रूप से संक्रमित सामग्री, संक्रमित व्यक्तियों (आदमी से आदमी) के सीधे संपर्क से प्रेषित होता है । एल एस डी वी त्वचा में गाँठ पैदा करता है एवं सामान्यीकृत संक्रमण के मामलों में और आंतरिक अंगों को शामिल करने पर मृत्यु का कारण बन सकता है ।

चिक्तिस्य संकेत :

गांठदार त्वचा रोग की ऊष्मायन अवधि लगभग 14–28 दिनों की बताई गई है। गंभीर मामलों में, शुरू में 41 डिग्री सेल्सियस से अधिक का बुखार होता है और एक सप्ताह तक रहता है । सभी सतही लिम्फनोड्स बढ़ जाते हैं । दुधारू गायों में दुग्ध उत्पादन काफी कम हो जाता है । घाव पूरे शरीर में वायरल के संक्रमण के % से 19 दिनों के बाद होते हैं, विशेष रूप से सिर, गर्दन, स्तन, अंडकोश, योनी और सांचे के आसपास कठोर, चपटे गांठ और नोड्यूल के साथ, कई विशिष्ट पूर्णांक घाव होते हैं, जो अच्छी तरह से सहसंयोजन तक सीमित होते हैं, 0.5–5 सेमी व्यास के होते हैं । नोड्यूल बाहरी त्वचा एवं अंदर की त्वचा की परत को प्रभावित करते हैं और अंतर्निहित चमड़े के नीचे के ऊतकों तक और कुछ मामलों में आसन्न धारीदार मांसपेशी तक फैल सकते हैं । ये गांठ मलाईदार भूरे से सफेद रंग के होते हैं और शुरू में सीरम बहा सकते हैं, लेकिन अगले दो हफ्तों में, एक शंक्वाकार केंद्रीय कोरयानेक्रोटिक / नेक्रोटिकप्लग (सिटफास्ट) के रूप में परवर्तित हो जाते है ।

ढेलेदार त्वचा रोग (एल एस डी)

निदान :

निदान के लिए, नमूनों में त्वचा पर गांठदार घाव, पपड़ी, शरीर के बाहरी आवरण पर पपड़ी, रक्त (संक्रमण के %–21 दिन बाद), नेत्र स्राव, नाक से स्राव और वीर्य शामिल हैं । वायरस की पुष्टि हिस्टोपैथोलॉजिकल परीक्षा, वायरस अलगाव के बाद पोलीमरेज़चेन रिएक्शन और इलेक्ट्रॉन माइक्रोस्कोपी द्वारा की जा सकती है ।

विभेदक निदान :

गंभीर एल एस डी बहुत अलग है, लेकिन हल्के रूपों को निम्नलिखित बिमारियों के साथ भ्रमित किया जा सकता है : बोवाइन हर्पीज मैमिलिटिस (गोजाती यहर्पीस वायरस 2) (कभी–कभी छद्म–ढेलेदार त्वचा रोग के रूप में जाना जाता है । गोजातीय पैपुलरस्टा माटाइटिस (पैरापोक्स वायरस), स्यूडोको पॉक्स (पैरापॉक्स वायरस), वैक्सीनिया वायरस और काउपॉक्स

वायरस (ऑर्थो पॉक्सविरस) – असामान्य और सामान्यीकृत संक्रमण नहीं, डर्माटोफिलोसिस, बेसनोइटोसिस, रिंडर पेस्ट, हाइपोडर्माबोविस संक्रमण, फोटो सेंसिटाइजेशन, पित्ती, त्वचीयतपेदिक, ओंकोसेर्कोसिस ।

इलाज :

वायरस के लिए कोई उचित अनुशंसित उपचार नहीं है । त्वचा में द्वितीयक जीवाणु संक्रमण को रोकने के लिए, इसका इलाज गैर–स्टेरायडल विरोधी दवाओं (एन एस ए आई डी) और एंटीबायोटिक दवाओं (सामयिक +/– इंजेक्शन) के साथ किया जा सकता है, जब उपयुक्त हो । जरूरत के मामले में एंटी बायोटिक मलहम लागू किया जाना चाहिए ।

निवारण :

ऐसी भयानक बीमारी की रोकथाम के लिए टीका करण सबसे अच्छा तरीका है । वैक्सीन एलएसडी से अच्छी सुरक्षा प्रदान करती है । पर्याप्त टीकाकरण कवरेज (80–100%) होना चाहिए । एलएसडी के खिलाफ होमोलॉगस (नीथलिंग एल एस डी स्ट्रेन) और हेटेरोलॉगस (एस पी पी वी और जी टी पी वीस्ट्रेन) दोनों टीकों का उपयोग किया जाता है । एल एस डी के लिए वर्तमान में केवल जीवित क्षीण टीके ही उपलब्ध हैं । वर्तमान में एल एस डी के लिए 'डिफरेंटियेटिंग इन्फेक्टेड फ्रॉम टीके वाले जानवरों' (डीआईवीए) वैक्सीन उपलब्ध नहीं है । विषम लैंगिकटीकों में या तो क्षीण भेड़ पॉक्स वायरस (एसपीपीवी) या बकरी पॉक्स वायरस (जीटीपीवी) होता है । एल एस डी के खिलाफ निष्क्रिय टीकों के लिए, टीकाकरण की रणनीति अलग–अलग होती है, यानी शुरू में एक महीने में दो टीकाकरण और फिर हर छह महीने में एक बूस्टर । ये रोग मुक्त देशों में भी उपयोग करने के लिए सुरक्षित हैं । ये फायदेमंद हो सकते हैं – यदि मवेशियों को रोग–मुक्त देशों से संक्रमित क्षेत्र में आयात किया जाना है – जानवरों को एक मारेगएटी के द्वारा संरक्षित किया जा सकता है और आगमन पर एक जीवित टीका के साथ पुन: टीका लगाया जा सकता है । इनका उपयोग उन्मूलन कार्यक्रम के एक भाग के रूप में किया जा सकता है । ये रोग मुक्त लेकिन जोखिम वाले क्षेत्रों में लागू होते हैं ।

टीकाकरण प्रोटोकॉल :

वयस्क मवेशियों/जानवरों के लिए, वार्षिक टीकाकरण होना चाहिए और बिना टीकाकरण की गाय से पैदा बछड़ों के लिए, उन्हें जीवन के किसी भी चरण में टीका लगाया जा सकता है । पहले से टीका लगी हुई गाय स`पैदा हुए बछड़ों या प्राकृतिक रूप से संक्रमित बांधों के बछड़ों के लिए, टीकाकरण 3–4 महीने की उम्र में किया जाना चाहिए । मवेशियों को अन्य रोगमुक्त क्षेत्र में ले जाने के लिए परिवहन से 28 दिन पहले पशुओं का टीका करण किया जाना चाहिए । प्रजनन करने वाले सांडों के मामले में, टीकाकृत बैल वीर्य में वैक्सीन वायरस का उत्सर्जन नहीं करते हैं और एक फील्ड वायरस के साथ चुनौती के बाद, टीकाकरण वीर्य को चुनौती वायरस के उत्सर्जन को रोकता है ।

टीकाकरण के दुष्प्रभाव :

थोड़ी देर के लिए पशु को बुखार रहेगा । दूध की उपज में अस्थायी गिरावट होगी । सामान्यीकृत त्वचा प्रतिक्रिया जिसको नीथलिंग रोग के नाम से जाना जाता है, वह जीवित क्षीण टीकाकरण के बाद दो सप्ताह के भीतर सामान्यीकृत छोटे त्वचा के घावों के रूप में दिखाई देती है। ये घाव एक या दो सप्ताह के भीतर गायब हो जाते हैं । दुष्परिणाम केवल तभी दिखाई देते हैं जब मवेशियों को पहली बार एल एस डी का टीका लगाया जाता है।जबपुन: टीकाकरण किया जाता है, तो जानवरों केप्रति कूल प्रतिक्रिया दिखाने की संभावना नहीं होती है । यदि मवेशियों को पहले एसपीपी/जीटीपीटी का लगाया जाता है तो एलएसडीटी का कोई दुष्प्रभाव नहीं डालता है । केवल स्वस्थ पशुओं को ही जीवित टीका लगाया जाना चाहिए । पहले से ही संक्रमित जानवरों के टीकाकरण से अधिक गंभीर बीमारी होती है और टीके और फील्ड स्ट्रेन का संभावित पुनर्संयोज न होने की संभावना

बहुत ज्यादा होती है ।

पर्यावरणीय उपाय:

मच्छरों के काटने से बचने के लिए जानवरों के आसपास मच्छरदानी का प्रयोग करें । पानी और सीवर की निकासी की समुचित व्यवस्था होनी चाहिए । नालों में मच्छर नियंत्रण के रूप में मिट्टी के तेल का प्रयोग किया जाना चाहिए । जानवरों के आसपास की सभी झाड़ियों और कचरे को हटा दें । फिनोल (2%/15 मिनट), सोडियम हाइ पोक्लोराइट (2–3%), आयोडीन यौगिकों (1:33), चतुर्धातुक अमोनियम यौगिकों (0.5%) और ईथर (20%) के साथ परिवेश और पशु खलिहान की उचित कीटाणु शोधन करनी चाहिए ।

पशु उपाय :

स्टोमोक्सिस मक्खी जैसे रक्त–आश्रित कीड़ों के काटने से बचने केलिए जानवर केशरीर पर एक्टोपैरासाइट्स विकर्षक का अनुप्रयोग झुंड में या नए आने वाले जानवर के लिए उचित संगरोध उपाय और प्रभावित जानवर का उचित अलगाव बचे हुए चारा और प्रभावित जानवर के पानी को त्याग दें ।

पशु मालिक संरक्षण :

प्रभावित जानवर के जानवर के दूध दुहने में उपयुक्त सफाई का अभ्यास किया जाना चाहिए।संदिग्ध और प्रभावित जानवर को चारा और पानी उपलब्ध कराते समय दस्ताने और मास्क का उचित उपयोग हाथों पर उपस्थित उचित खुले घाव का चिकित्सकीय उपचार किया जाना चाहिए और ठीक से कवर किया जाना चाहिए । नियमित रूप से हैंड सैनिटाइज़र का उचित उपयोग करना चाहिए ।

वर्तमान तथा भविष्य को देखते हुये वेटनरी प्रैक्टिस रेगुलेशंस तथा भारतीय पशुचिकित्सा परिषद 1984 अधिनियम के प्रावधानों में सुधार हेतु सुझाव

डा. दीपनारायण सिंह
पशुधन उत्पादन एवं प्रबन्धन विभाग, दुवासू, मथुरा ।

हमारे भारत वर्ष में पशुधन ही भारतीय अर्थव्यवस्था का मेरूदंड है । पशुपालन एक आर्थिक उद्यम है और इसे भारत में लाखों लोगों के लिए उत्तरजीविता उद्यम के रूप में जाना जाता है । पशुपालन भारतीय कृषि का सबसे महत्वपूर्ण घटक है जो हमारे देश के ग्रामीण, विशेष रूप से सीमांत, छोटे और भूमिहीन किसानों की दो तिहाई से अधिक की आजीविका एवं आय अर्जन में महत्वपूर्ण भूमिका निभाता है । भारत में 85 प्रतिशत पशुधन रखने वाले छोटे और सीमांत किसान हैं, जिनके पास 2 हेक्टेयर से कम भूमि है । छोटे ग्रामीण परिवारों की आय में पशुधन का योगदान 16 प्रतिशत है, जबकि सभी ग्रामीण परिवारों का राष्ट्रीय औसत 14 प्रतिशत है । इतना ही नहीं, पशुधन क्षेत्र देश की 8.8 प्रतिशत आबादी को रोजगार प्रदान करता है जिसमें बड़े पैमाने पर भूमिहीन और अनपढ़ आबादी शामिल है । पशुधन क्षेत्र ने सदैव देश एवं किसानों की उन्नति एवं समृद्धि में महत्वपूर्ण भूमिका निभाई है ।

श्री नंदा कुमार, अध्यक्ष राष्ट्रीय डेयरी विकास बोर्ड (राष्ट्रय दूध विकास बोर्ड, आनन्द, गुजरात) के शब्दों से यह स्पष्ट है कि 2022 तक किसानों की आय दुग्ध उत्पादन, पशु पालन एवं कृषि के बिना असंभव है । जो यह परिलक्षित करता है कि हम अपने पशुधन की मद्द से समृद्धि के मार्ग को प्रशस्त कर सकते हैं । किसी देश की विकास एवं उन्नति का सीधा संबंध ऊर्जा, नवीकरणीय और गैर–नवीकरणीय संसाधनों से है । पशु उपोत्पाद जैसे कि संशोधित पशु प्रोटीन, पशु वसा, दूध और अंडे के उत्पाद, और पूर्व खाद्य उत्पाद पशुधन को खिलाने एवं उनका मूल्य संवर्द्धन करने से भी पशुपालक बन्धु अत्यधिक आय का अर्जन कर स्वावलम्बी बन सकते हैं, साथ ही पशुधन से समृद्धि की तरफ अग्रसारित हो सकते हैं ।

वर्तमान परिदृश्य में हमारे भारत देश में किंचित ही छात्र/छात्रा पशुचिकित्सा प्रोफेसन को अपनाने के लिये प्रतियोगी परिक्षाओं की तैयारी करता है, और ना ही अपने देश में पशुचिकित्सा हेतु कोई कोचिंग संस्थान है । देश में मानव स्वास्थ्य एवं चिकित्सा के प्रति लोगों का झुकाव एवं समर्पण अत्याधिक है, जिसे हमें बदलने की आवश्यकता है । पशुचिकित्सा विद् एवं पशु चिकित्सकों के प्रति आदर एवं श्रद्धा के भावजागृत करने की आवश्यकता है ।

वर्तमान तथा भविष्य को देखते हुये वेटनरी प्रैक्टिस रेगुलेशंस तथा भारतीय पशुचिकित्सा परिषद 1984 अधिनियम के प्रावधानों में सुधार हेतु आवश्यक संशोधनो की जरूरत है, जिससे इस प्रोफेसन एवं पशुचिकित्सा से जुड़ने वाले चिकित्सकों के प्रति आम जनमानस में एक श्रद्धा एवं आदर का भाव जागृत हो सके ।

1. वेटनरी प्रैक्टिस रेगुलेशंस में पाठ्यक्रम को सरल एवं ज्ञानोपरक बनाया जाये साथ ही व्यवहारिक ज्ञान पर अत्यधिक ध्यान केन्द्रित करने की आवश्यकता है ।
2. वर्ष 2008 से पूर्व के पाठ्यक्रम को अपनाना उचित होगा ।
3. समेस्टर प्रणाली के अनुसार पाठ्यक्रम पढ़ाया जाय तथा समेस्टर के अंत में परीक्षा सम्पादित कराया जाय । दो समेस्टर के आंतरिक मूल्यांकन के बाद एक वाह्य परीक्षा कराई जाये तथा प्रयोगात्मक परीक्षाए एवं थ्यौरी उत्तरपुस्तिका का मूल्यांकन वाह्य परीक्षक के द्वारा कराया जाये ।

4. निरन्तर पाठ्यक्रम में हो रहे बदलावों पर अंकुश लगाया जाये ।
5. उद्यमशीलता अर्थात एक अच्छा ईंटर प्रेन्योर बनाने के प्रति अधिक अभिरूचि हो ।
6. प्रयोगात्मक जानकारी एवं पशु कल्याण हेतु मृत पशुओं एवं जीवित पशुओं में अनुसंधान की पूर्ण छूट देने चाहिये ।
7. कुक्कुट पालन विज्ञान विभाग, पशु महामारी विज्ञान विभाग एवं पशु जैव रासायन विभाग को पुनः एक अलग विभाग माना जाये ।
8. पशुचिकित्साविद् एवं पशुचिकित्सकों को ज्ञान का प्रसार करने हेतु विभिन्न प्रसार माध्यमों का प्रयोग करने की पूर्ण आजादी मिले ।
9. पशुचिकित्सा पाठ्यक्रम को उद्योग से जोड़ा जाये जिससे कि पशुचिकित्सा के क्षेत्र में रोजगार के अवसर बढ़ेंगे ।
10. रोजगारन्वोषी पाठ्यक्रम के प्रति अत्यधिक संवेदनशील होना होगा ।
11. पशुचिकित्साविद् एवं पशुचिकित्सकों की योग्यता धारिता को तकनीकी युक्त अर्थात टेक्नीकल करने हेतु आवश्यक सुधार करना होगा, जिससे हमारे पशुचिकित्साविद् एवं पशुचिकित्सकों को मानव चिकित्सक के समान वेतनमान एवं नान प्रैक्टिस एलाउंस प्राप्त हो सके ।
12. डिग्रीधारक पशुचिकित्सकों को ही पशु चिकित्सा हेतु अनुमन्य किया जाये, डिप्लोमा धारक अथवा झोला छाप व्यक्तियों को पशुचिकित्सा के लिये पूर्णतया प्रतिबन्धित करने के लिये कड़ा कानून बनाना उचित होगा ।
13. पशुचिकित्सा के क्षेत्र में आवश्यकतानुसार पशु उत्पादों का मूल्यसंवर्द्धन, विपणन एवं भंडारण के प्रति आवश्यक कदम उठाने की आवश्यकता है ।
14. गुणवत्ता युक्त पशु उत्पादों के विपणन हेतु एक नियामक एजेन्सी गठित हो ।
15. नर बछड़ा के सम्यक निष्पादन हेतु आवश्यक योजना लागू करने की आवश्यकता है ।
16. फसल अवशेषों का समुचित उपयोग, पूरे वर्ष रसीले हरे चरागाहों या हरे चारे की उपलब्धता के साथ फसल अनुक्रमण, फसल रोटेशन और एकीकृत कृषि प्रणालियों को अपनाने वाले गैर–पारंपरिक फीड संसाधनों और पर्यावरण सुरक्षा के प्रति भी आवश्यक एडवाईजरी जारी करना आवश्यक है ।

अतः वर्तमान तथा भविष्य को देखते हुये वेटनरी प्रैक्टिस रेगुलेशंस तथा भारतीय पशुचिकित्सा परिषद 1984 अधिनियम के प्रावधानों में सुधार हेतु मेरे विचार से उपरोक्त सुझाव को अपनाने से पशु चिकित्साविद् एवं पशु चिकित्सकों के लिये सहायक सिंद्ध होगा साथ ही पशुपालक बन्धुओं को भी अधिकतम लाभ मिलेगा तथा डेयरी, मांस और त्वचा उद्योग से संबन्धित पदार्थों के मूल्यसंवर्धन और पशु उपोत्पाद के समुचित उपयोग से किसानों की सामाजिक–आर्थिक स्थिति भी सुदृढ़ होगी ।

अजाक्षीरः बकरी के दूध के सेवन के फायदे और नुकसान

डॉ पूनम यादव, डॉ आदित्य मिश्रा, डॉ दीपिका डी. सीजर, डॉ संजू मंडल,डॉ आनंद जैन एवं डॉ जितेंद्र कुमार
पशु शरीर क्रिया और जैव रसायन विभाग
पशु चिकित्सा और पशु पालन महाविद्यालय जबलपुर –482001 (म.प्र.)

सेहतमंद रहने के लिए दूध बहुत उपयोगी है। ज्यादातर लोग गाय या भैंस के दूध को पसंद करते हैं, लेकिन बकरी का दूध भी सेहत के लिए बहुत फायदेमंद होता है । इसमें बहुत से लाभकारी तत्व पाये जाए हैं, जैसे कि, कार्बोहाइड्रेट, प्रोटीन, लिपिड, विटामिन, कैल्सियम, मैग्नीशियम,कॉपर, आइरन आदि पाये जाते हैं । बकरी के दूध को आयुर्वेद में अजाक्षीर (अजा– बकरी, क्षीर– दूध) कहते हैं । यह दूध पोषण के साथ साथ कई तरह कि शारीरिक और मानसिक समस्याओं से भी राहत पहुंचा सकता है । इसमे अन्य पोषक तत्वों कि अपेक्षा सेलेनियम मिनरल कि मात्रा अधिक पायी जाती है जो शरीर कि प्रतिरोधक क्षमता को बढ़ाने में मदद करता है । इसके अतिरिक्त बकरी का दूध शरीर को कई प्रकार के रोगों से बचाने में मदद करता है और हमारे शरीर कि कार्य–प्रडाली क्षमता भी बढ़ाता है ।

बकरी के दूध के फायदे

प्रभावशाली स्वास्थ्य लाभों के कारण बकरी का दूध काफी लोकप्रिय हो गया है । अच्छे स्वास्थ्य लाभ निम्नलिखित हैं–

1. **डेंगू में लाभ –** बकरी के दूध का आयुर्वेद में बहुत महत्व है और इसके औषधीय गुणों के कारण बकरी का दूध डेंगू, चिकनगुनिया आदि रोगों में बहुत लाभकारी होता है । डेंगू, चिकनगुनिया रोग में खून में प्लेटलेट्स की संख्या कम होने लगती है । बकरी का दूध प्लेटलेट्स की संख्या बढ़ाने और शरीर की रोग प्रतिरोधक छमता को बढ़ाने में मदद करता है ।
2. **हृदय के लिए फायदेमंद –** हृदय हमारे शरीर का अहम अंग है । हृदय रोग से ग्रस्त व्यक्तियों के लिए बकरी का दूध बहुत लाभदायक होता है । बकरी के दूध में मैग्नीशियम कि अच्छी मात्र पायी जाती है, जो विशेष रूप से हृदय कि धड़कन को बनाए रखने में मददगार होता है और इसमें कोलेस्ट्रॉल कि मात्रा भी कम होती है, जिस कारण यह हृदय और धमनियों के लिए फायदेमंद होता है । इसमें मध्यम–चेन फेटी–एसिड अधिक मात्रा में होते हैं, जो कोलेस्ट्रॉल के स्तर को कम करने में मदद करते हैं ।
3. **चयापचय के लिए –** चयापचय प्रक्रिया शरीर में पर्याप्त पोषण तत्वों को उपलब्ध करने में मदद करती है । जिन व्यक्तियों का शरीर पोषक तत्वों को अवशोषित करने में असमर्थ होता है उनके लिए बकरी का दूध फायदेमंद माना जाता है । इसके सेवन से शरीर में आइरन और कॉपर के चयापचय में सहायता मिलती है ।
4. **आसानी से पचने योग्य –** बकरी के दूध मेंछोटे आकार के वसा ग्लोब्यूल्स पाये जाते हैं । जिसकी वजह से अन्य दुग्ध पदार्थों के मुकाबले बकरी के दूध और उससे बने खाद्य पदार्थों को पचाने में आसानी होती है । इसमें पायी जाने वाली प्रोटीन गाय के दूध कि अपेक्षा जल्दी पच जाती है । बकरी के दूध में गाय कि तुलना में लैक्टोज़ भी कम होता है ऐसे में इसे पचाना और भी आसान हो जाता है और पेट को स्वस्थ्य रखने में सहायता होती है ।

5. **वजन कम करने में सहायक–** बकरी के दूध में मौजूद फेटी एसिड शरीर में अतिरिक्त चर्बी को कम कर वसा को बढ़ने से रोकने में सहायक होता हैं ।

6. मानसिक स्वास्थ्य में सहायक– बकरी के दूध में मौजूद लिनोलेनिक एसिड दिमाग के विकास में लाभकारी होता है और साथ ही यह दिमाग को शांत करने और तनाव मुक्त रखने में सहायक होता है ।

बकरी के दूध के अन्य फायदे –

- इसमें कैल्सियम के साथ ट्रिपटोफान अमीनो एसिड भरपूर मात्रा में होता है, जो कि हड्डियों और दांतों को मजबूत रखता है । बकरी का दूध पीने से ऑस्टियोपोरोसिस होने कि संभावना भी कम रहती है ।
- बकरी का दूध एंटि– इनफ़्लामेटरी गुणों से भरपूर होता है और इससे सूजन को कम करने में मदद मिलती है ।
- ऐसा माना जाता है कि गर्भावस्था के दौरान बकरी का दूध पीने से कब्ज कि समस्या नही होती ।
- इसमें कुछ मात्रा में आइरन पाया जाता है इसलिए ऐसा माना जाता है कि एनीमिया में बकरी का दूध लाभकारी होता है ।

बकरी का दूध पीने के नुकसान

अधिकतर हर चीज का अच्छा और बुरा दोनों ही प्रभाव पड़ता है । ऐसे ही बकरी के दूध का भी कुछ नुकसानदेह प्रभाव देखा गया है, जो कि निम्नलिखित है–

- कुछ लोगों में बकरी के दूध से एलर्जि कि समस्या देखी गयी है । ऐसे में दूध के सेवन से पहले डॉक्टर कि सलाह अवश्य लें ।
- इसके अत्यधिक सेवन से पेट दर्द और दस्त कि समस्या हो सकती है । इसलिए ज्यादा मात्रा में दूध के सेवन से बचें ।
- 6 माह से कम आयु के शिशुओं को बकरी का दूध न दें ।

बकरी पालन : संसाधन विहीन किसानों के लिए आजीविका का एक वैकल्पिक स्रोत

1 दीपक चंद मीना, 2 अक्षिता चक्रा, 3 जसवंत कुमार सेंगर

1,3 भा. अनु.प. – राष्ट्रीय डेरी अनुसंधान संस्थान, करनाल, हरियाना – 132001

2 गुरु अंगद देव पशु चिकित्सा एवं पशु विज्ञान विश्वविद्यालय, लुधियाना, पंजाब – 141001

प्रकति ने छोटे किसानों को वरदान के रुप में बकरियाँ दी है । बकरी पालन मुख्यत: दूध एवं माँस के लिए किया जाता है । भूमिहीन, लघु एवं सीमान्त किसानों के लिए बकरी पालन एक अच्छा एवं लाभकारी रोजगार है । ये न्यूनतम खाद्य ग्रहण करके मनुष्य को उच्च स्तर का आहार जैसे दूध, माँस इत्यादि देती है । उच्च रोग प्रतिरोधी क्षमता और अधिक उत्पादन के कारण ये निर्धनों हेतु सर्वश्रेष्ठ पालतू पशु मानी जाती है । बकरी एक बहुउपयोगी, सीधा–साधा, किसी भी वातावरण में आसानी से ढलने वाला छोटा पशु है जो अपनी रहन–सहन व खान–पान सम्बंधित आदतों के कारण सबका चाहता पशु है । अकाल जैसी भीषण परिस्थिति में जब किसी अन्य तरह का पशुपालन दूभर हो जाता है तो बकरी पालन द्वारा निर्धन वर्ग के लोग अच्छी आय प्राप्त कर सकते है । बकरियों का दूध, बच्चों एवं रोगियों के लिए बहुत उपयोगी होता है क्योंकि प्रतिरोधी क्षमता अधिक होने के साथ–साथ इसका पालन भी आसानी से हो जाता है । अच्छे गुणों वाले दूध के साथ–साथ बकरियों से अच्छे प्रकार का माँस भी मिलता है जिससे किसान की अच्छी कमाई हो जाती है । बकरी के गोबर को मिंगन कहते है जिससे बढ़िया किस्म की खाद बनती है । इन मिंगन को किसान बेच के एक अच्छा लाभ प्राप्त कर सकता है और इन मिंगन के खाद को अपने खेत में डाल के कृषि खेती को अधिक उपजाव भी बना सकता है । इस पशु के मरने के बाद इसके खाल की कीमत भी अच्छी होती है । बकरी को भारत में गरीबो की गाय के नाम से भी जाना जाता है । भारत में बकरियों की जनसँख्या 148.9 मिलियन है जो विश्व की कुल जनसँख्या का लगभग 20 प्रतिशत हिस्सा भारत में में पाया जाता है ।

बकरियों से किसान कही प्रकार से लाभ उठा सकता है जैसे वह दूध देने वाली बकरी को जरूरत बंध किसान को बकरी बेचकर, बकरी को माँस के रूप में बेचकर, मरने के बाद उसकी खाल बेचकर एव बकरियों के मिंगन को बेचकर इत्यादि तरीके से बकरी पालक लाभ उठा सकता है।

किसानो के लिए प्रमुख बकरी की नस्ले एव उनको अच्छी नस्ल चयन करने का तरीका

वैसे तो बकरियों की बहुत सारी नस्ले है परन्तु किसान के लिए मुख्यत जमनापुरी, बारबरी, सिरोही, ब्लैक बंगाल फायदे बंद हैं ।

मादा का चयन कैसे करे

1. बकरी का पिछला हिस्सा तिकोना एव पैर मुड़ा हुआ होना चाहिये
2. बकरी स्वस्थ एव नस्ल के अनुसार रूप, रंग एव भार के हो
3. उम्र के हिसाब से थन का विकास अच्छे से हुआ हो
4. दो बियातो की बिच कम अन्तराल एव जुड़वा बच्चे देती हो जिससे बकरीपालक को दोगुना फायदा होता है

नर बकरे का चयन कैसे करे

1. नस्ल के अनुसार रूप, रंग एव कद –काठि अच्छी हो
2. शारीरिक रूप से पूर्ण स्वस्थ एव चुस्त हो
3. दोनों अंडकोष पूर्ण रूप से विकसित हो
4. अच्छी स्वस्थ और निरोगी माँ की संतान हो

जमुनापारी – यह उच्च कोटि नस्ल की बकरी है जो मुख्यत: उत्तरप्रदेश प्रदेश के इटावा, मथुरा, आगरा, जनपदो में पाई जाती है। यह बकरी एक वर्ष में एक बार बच्चा देती है। बकरी का आकार बड़ा होने एवं दूध की अधिक उत्पादन क्षमता के कारण ये दूध एवं माँस दोनों प्रकार में उपयोगी होती है। मादा बकरी प्राय: एक वर्ष की उम्र में ग्याभिन हो जाती है। जून–जुलाई में गाभिन बकरी अक्तूबर–नवम्बर में बच्चा देती है और गर्मी भर दूध देती रहती है। इनके मेमने भी अच्छी कीमतों पर बिक जाते हैं. और इस नस्ल के वयस्क नर का औसत वजन 70 से 90 किलोग्राम का होता है, साथ ही मादा का वजन 50 से 60 किलोग्राम का होता है.

बारबरी – यह पश्चिमी उत्तर प्रदेश के जिले जैसे आगरा, अलीगढ़ मथुरा, दिल्ली, हरियाणा एव राजस्थान में मुख्यत: पाई जाने वाली प्रजाति है । यह 13–14 माह में दो बार ब्याती है और प्रति ब्यांत में दो या दो से अधिक बच्चे देती है । यह माँस एवं दूध दोनों के उत्पादन के लिए उपयोगी होती है ।

ब्लैक बंगाल – ये पश्चिमी बंगाल एवं उड़ीसा में पायी जाने वाली उच्च नस्ल की है, यह बकरी उच्चकोटि का माँस प्रदान करती है। इस नस्ल की बकरिया मुख्यत अच्छे माँस उत्पादन के पुरे भारत में जनि जाती है ।

इन नस्ल के अलावा भी बहुत सारि बकरियों की नस्ल है जैसे बीटल, मालबरी, गद्दी, सिरोही नस्ल की उपयोगी बकरियो की नस्ल देश के विभिन्न भागों में पाई जाती है । चेगु नस्ल की बकरी जो कश्मीर में ही पाई जाती है जो की इससे उच्चकोटि की 'पशमीना' प्राप्त होता है । पशमीना उन सबसे महंगी उनो में से एक है ।

बकरियों का प्रबंधन कैसे करे

बकरियों का अच्छे से प्रबंधन करने से उनकी उत्पादन क्षमता बढ़ती है जिससे बकरीपालक अधिक से अधिक लाभ प्राप्त कर सकता है । अच्छा प्रबंधन बकरी ही नहीं हर प्रकार के पशु के उत्पादन की वर्धि करने में बहुत ही सहायक है ।

पोषण प्रबंधन

अर्ध सघन एव सघन में पद्धति में रखे जाने वाले बकरे एव बकरियों में प्रतिदिन दाने /चारे की मात्रा

उम्र	दाना मिश्रण	सूखा चारा	हरा चारा
मेमने (3 –12 माह)	100–300 ग्राम	100–400 ग्राम	500 ग्राम – 1 किग्रा
व्यस्क बकरा/ बकरी	200–250 ग्राम	300–600 ग्राम	1–2.5 किग्रा
ग्याभिन बकरी	400–500 ग्राम	300–600 ग्राम	1–3 किग्रा
प्रजनन व प्रजनन के समय	400 ग्राम	300–600 ग्राम	1–3 किग्रा

1. अर्ध सघन पद्धति में बकरियों को 5 –6 घंटे चराई जाए।
2. दाना मिश्रण बनाने के लिए खली 20 प्रतिशत, ज्वार /बाजरा /मक्का /गेहूँ 60 प्रतिशत, भूसी 17 प्रतिशत , खनिज मिश्रण 1.5 प्रतिशत मिलाना चाहिये।
3. बकरी के आहार में अचानक कोई परिवर्तन नहीं चाहिये अगर करना भी छाए तो धीरे धीरे अंतराल में करना चाहिये
4. बकरियों के बाड़े में हरा चारा, भूसा व दाना उपयुक्त उपकरण में देना चाहिये, इससे आहार का नुकसान नहीं होता है एव चारा संक्रमित भी नहीं होता।

आवास प्रबंधन

आधिकांश: बकरी आवास की लम्बाई 20 मीटर , चौड़ाई 6 मीटर तथा किनारे पर ऊचाई 2.7 मीटर रखी जाती है। बकरियों को उम्र के आधार पर अलग अलग जगह की जरूरत परती है।

उम्र	ढकी जगह की आवश्यकता (वर्ग मीटर में)	बाड़े की आवश्यकता (वर्ग मीटर में)
3 महीने तक के बच्चे	0.2–0.3	0.4–0.6
3 से 9 महीने तक के बच्चे	0.6–0.75	1.2–1.5
9 से 12 महीने तक के बच्चे	0.75–1.0	1.5–2.0
1 – 2 वर्ष तक के युवा बच्चे	1.0	2.0
वयस्क बकरे	1.5–2.0	3.0–4.0
गाभिन एव दूध देने वाली बकरियाँ	1.5–2.0	3.0

स्वास्थ्य प्रबंधन

बकरी पालन की सफलता के लिए उसका स्वस्थ होना बहुत जरूरी है। स्वास्थ्य प्रबंधन में थोड़ी सी लापरवाही करने से बकरीपालक को बहुत भारी नुकसान उठाना पर सकता है जैसे बच्चे की बढ़ोतरी दर एव उत्पादन बकरियों के उत्पादन में कमी देखने को मिलती है। इसलिए जब भी बकरी अस्वस्थ महसूस करे तो तुरंत चिकित्सक से परामर्श करके बकरी का ईलाज तुरंत करवाना चाहिये ।

बकरियों के लिए टीकाकरण सारणी

बीमारी	प्रथम टिका	बूस्टर टिका	पुन: टीकाकरण
बकरी पलेग (पी.पी.आर)	3 महीने की उम्र	आवश्यकता नहीं	3 वर्ष पश्चात

आंत्र विषाक्तता(इंटेरोटोक्सेमिया)3 –4 महीने की उम्र प्रथम टीकाकरण के 3 – 4 सप्ताह के पश्चात दूसरा टिका वार्षिक (एक माह के अंतराल में 2 बार)

बकरी प्रबंधन के लिए सामन्य जानकारियाँ

1. नियमित रूप से बकरियो के आवास की सफाई करनी चाहिये तथा जो भी बाड़े से गन्दगी निकले उसे दूर कही गकेृ में डालना चाहिये।
2. बाड़े के अंदर एव बाड़े के बहार हते में एक बार भुजे हुए चुने से छिड़काव करना चाहिये जिससे मच्छर वगेरा होने की संभावना काम होगी।
3. प्रतिमाह बाड़े के अंदर फर्श के ऊपर सूखा चारा डालके जला देना चाहिये जिससे बाड़े के भीतर और बाहर पूर्ण विसंक्रमण हो जाता है जिससे परजीवी की सभी अवस्था नष्ट हो जाती है।
4. प्रति चार माह के अंतराल में बाड़े की मिट्टी को लगभग 6 इंच तक खोदके निकाल देना चाहियेऔर दूसरी मिटटी डालना चाहिये जिससे संक्रमण की सम्भावना काफी हद तक कम हो जाती है।
5. बीमार जानवर को स्वस्थ जानवर से अलग रखकर उसका अच्छी तरह से उपचार करना चाहिये।
6. नए खरीदे गए जानवरो को कुछ दिन लगभग 21 दिन तक अलग रखना चाहिये उसके बाद ही उसको झुंड में शामिल करना चाहिये।

बकरियों को कहाँ व कैसे बेचें

बकरियों का मुल्ये निर्धारण उसके वजन के आधार पर करे । बकरियों को सही ग्राहकों को उचित मूल्य में बेचें। जब बकरी पालक अपनी बकरी बेचते वक्त ग्राहकों को बकरियों की नस्ल, वेवहार, आकार और उम्र के बारे मे पूर्ण जानकारी प्रदान करें जिससे ग्राहकों को बकरी की दिनचर्या एव उसके आचरण को समझने में आसानी होगी । बकरी विशेष कर उनके मांस, खाल, दूध, ऊन और खाद के लिए पाली जाती है। इनको ज्यादातर व्यापारी खरीदते हैं या बकरीपालक खुद कसाई को बेच सकते हैं और किसान सीधा जाकर बाजार और कसाई खाने में भी बेच सकते हैं। अगर किसान सीधा जाकर कसाई खाने में जाकर बेचता है तो उसको अधिक मूल्य प्राप्त होगा। कही बार व्यापारी इन्हें कम मूल्य में खरीद इन्हें बाजार में ज्यादा रेट मे बेचते हैं तो अगर बकरी पालक इन्हें सीधा बाजार मे बेंचे तो आपके लिए ज्यादा फायदेमंद होगा।

दुधारू पशुओं में लम्पी स्कीन डिसीज व महत्वपूर्ण टीकाकरण

डॉ. जयप्रकाश1 , डॉ. पी. के. गुप्ता2
1वैज्ञानिक (पशुपालन), 2परियोजना समन्वयक
कृषि विज्ञान केन्द्र, उजवा दिल्ली

ढेलेदार त्वचा रोग (लम्पीस्कीनडिसीज – एलएसडी) गौवंशीय में होने वाला विषाणु जनित संक्रामक रोग है । जो कि पोक्स फेमिली केवायरस जिससे अन्य पशुओं में पॉक्स (माता) रोग होता है। वातावरण में गर्मी एवं नमी केबढ़ने केकारण देश केविभिन्न प्रदेशों में जैसे मध्यप्रदेश, उड़िसा, उत्तरप्रदेश, महाराष्ट्र, पश्चिम बंगाल केसाथ–साथ हमार क्षेत्र दिल्ली व्हरियाणा के कुछ इलाको में भी पाया जा रहा है ।

संक्रमण कैसे फैलता है :–

स्वस्थ पशुओं को यह बिमारी एल एस डी संक्रमित पशुओं के सम्पर्क में आने से व वाहक मच्छर/टिक्स (चमोकन) से होता है । एल एस डी की वजह से दुधारू पशुओं में दुध उत्पादन एवं अन्य पशुओं की कार्य क्षमता कम हो जाती है ।

लक्षण :

एक या दो दिन तेज बुखार, शरीर एवं पांव में सुजन, शरीर में गठानवचकते, गठान का झड़ कर गिरना एवं घावक निर्माण

बचाव :

संक्रमित पशुओं को स्वस्थ पशुओं से अलग रखे, पशुओं एवं पशु घर में टिक्समारक दवा का उपयोग करें ।

उपचार :

चूँकि एल एस डी विषाणु जनित रोग है तथा टीका एवं रोग विशेष औषधी न होने के कारण पशु चिकित्सक के परामर्श से लक्षणात्मक उपचार किया जा सकता है । बुखार की स्थिति में पैरासिटामाल, सुजन एवं चर्म रोग की स्थिति में एन्टी हिस्टामिनिक एवं एन्टीइंफलामेट्री दवाई या तथा द्वितीयक जीवाणु संक्रमण को रोकने हेतु 3–5 दिनों तक एन्टीवायोटिक दवाईयों का प्रयोग किया जा सकता है ।

ढेलेदार त्वचा रोग का आर्थिक प्रभाव :

एलएसडी उच्च रुग्णता लेकिन कम मृत्यु दर के साथ जुड़ा हुआ है। आपके झुंड के 40% तक संक्रमित हो सकते हैं और मृत्यु दर 10% तक जा सकती है।इस रोग से दुग्ध उत्पादन में कमी, स्थायी या अस्थायी हानि हो सकती है। प्रजनन झुंड में प्रजनन क्षमता का कम या पूर्ण नुकसान । गर्भपात के साथ–साथ त्वचा को स्थायी नुकसान ।

अपील :

इस रोग में पशु मृत्यु दर नगण्य है। पशुपालकों से आग्रह किया गया है कि एलएसडी से भयभीत न होकर बताये जा रहे तरीकों से पशुओं का बचाव उपचार करावें । विशेष परिस्थितियों में निकटम पशु चिकित्सक से तत्काल सम्पर्क करें । कुल मिलाकर यह मुख्य रूप से पशु के आर्थिक मूल्य को प्रभावित करता है ।

पशुओं में वर्षा ऋतु (जुलाई से सितम्बर) अक्टूबर तक महत्वपूर्ण टीकाकरण :

खुर पका मुंह पका

	4 माह से अधिक	**प्रत्येक 6 माह के अंतराल पर**
गलगोटू	6 माह से अधिक	वर्ष में एक बार
लंगड़ाबुखार	6 माह से अधिक	जीवन में एक बार
ब्रूसीलोसिस	4–8 माह से अधिक	1–2 बारसा लाना
थैलेरिओसिस	3 माह से अधिक	1–2 बारसा लाना

टीकाकरण के दौरान गाभिन पशुओं में सावधानियां व उनकी देखभाल :

1. ऐसे पशुओं को अंतिम गर्भ काल अवस्था में सबसे अलग सूखे व स्वच्छ स्थान पर रखें ।
2. ऐसे पशुओं से 60–90 दिन पहले दूध लेना बंद कर देना चाहिए ।

   दो–तीन दिन में 1 बार दूध निकाले ।

   2 दिन में एक बार दूध निकाले ।

   3 दिन में एक बार दूध निकाले ।
3. मादा पशु में शिशु का विकास छह–सात महीनों में बहुत धीमी गति से होता है ।
4. गर्भकाल के अंतिम 3 महीनों में अधिक तेजी से होता है अतः उस समय उचित पौष्टिक आहार अनिवार्य है । अतः स्वस्थ व बीमारी मुक्त पशुपालन के लिए उपरोक्त सभी निर्देशों के अनुपालन करें ।

भेड़ व बकरियों में पी. पी. आर. रोग

डॉ. विनय कुमार एवं डॉ. सुशील कुमार मीणा
पशु विज्ञान केंद्र रतन गढ़ (चूरू)
राजस्थान पशु चिकित्सा और पशु विज्ञान विश्वविद्यालय, बीकानेर

भेड़ व बकरियां ज्यादा तर समाज के कमजोर एवं गरीब वर्ग द्वारा पाली जाती है इसलिए यह बीमारी मुख्यतः छोटे व मध्यम वर्गीय पशुपालकों को ज्यादा प्रभावित करती है, जिसका आजीविका का मुख्य स्रोत भेड़ व बकरी पालन है । यह रोग एक विषाणु (मोर बिलि विषाणु) जनित रोग है । इस रोग में मृत्यु दर बहुत अधिक होती है।यह रोग भेड़ व बकरियों में फैलता है । भेड़ की तुलना में बकरी में यह रोग अधिक होता है। यह रोग सभी उम्र व लिंग की भेड़ बकरियों को प्रभावित करता है लेकिन मेमनों में मृत्युदर बहुत अधिक होती है । यह रोग पशुओं में बहुत तेजी से फैलता है और इस रोग से पशु की मृत्यु बहुत तेजी सेहोतीहै, इसलिए इसे प्लेग के नाम से भी जानते हैं । इस रोग में अधिक मृत्यु दर होने की वजह से यह बीमारी पशुपालकों को आर्थिक दृष्टि से बहुत हानि पहुंचाती है और पशुपालक आर्थिक रूप से बहुत कमजोर हो जाता है ।

रोग के लक्षण –

- इस रोग में पशु को तेज बुखार आता है, जो चार से पांच दिनों तक रहता है ।
- पशु खाना – पीना व चलना – फिर नाबंद कर देता है ।
- त्वचा रूखी हो जाती है ।
- रोगी पशु के मुंह, होंठ व जीभ पर छाले हो जाते हैं जिसकी वजह से पशु के मुंह से लार गिरती है ।
- रोगी पशु के मुंह व होंठ में सूजन आ जाती है जिससे पशु को सांस लेने में तकलीफ होती है ।
- इस रोग में पशु के मुंह में छाले हो जाते हैं ।
- आंखों से पानी आता है तथा लगातार दस्त लगते हैं, जिससे पशु के शरीर में पानी की कमी हो जाती है ।
- पशु की नाक से लगातार स्राव होता है जो शुरू में पानी जैसा होता है तथा बाद में गाढ़ा हो जाता है ।
- ग्याभिन पशु को गर्भपात भी हो सकता है ।
- दस्त एवं निमोनिया के लक्षण उत्पन्न हो जाते हैं ।
- उचित ईलाज न करवाने पर पशु की एक सप्ताह के भीतर मृत्यु हो सकती है ।

रोग से बचाव के उपाय –

- इस रोग से बचाव के लिए अपने पशुओं को स्वच्छ वातावरण में रखें व उचित पोषण दें एवं सही देखभाल करें ।
- इस रोग से बचाव के लिए टी के अवश्य लगवाने चाहिए ।
- दो माह की उम्र के पश्चात यह टीके लगवाएं जा सकते हैं । फिर बूस्टर डोज दो सप्ताह बाद अवश्य लगवायें । एक बार इस रोग काटी का लगवाने के बाद तीन साल तक इस रोग से बचाव होता है यानी तीन साल बाद ही टीके की आवश्यकता होती है ।
- इस रोग में बीमार पशु को तुरन्त स्वस्थ पशु से अलग कर देना चाहिए । यह रोग बीमार से स्वस्थ पशु में फैलता है ।
- पशु की साफ – सफाई का पूरा ध्यान रखना चाहिए ताकि विषाणु का फैला व स्वस्थ पशु में ना हो सके ।
- बाड़े में रोगी पशु के दस्त को अच्छी तरह से साफ करना चाहिए ।
- नजदीकी पशु चिकित्सक से परामर्श लेकर रोगी पशु को उचित औषधी देनी चाहिए ।

पशुओं में कीटोसिस और उसका सुधार

रंजीत आइच, श्वेता राजोरिया, आम्रपाली भीमटे, अर्चना जैन एवं ज्योत्सना शकर पुड़े
पशु शरीर क्रिया एवं जैव रसायन विभाग, पशु चिकित्सा विज्ञान एवं पशुपालन महाविद्यालय,महू

कीटोसिस एक चयापचय विकार है जो जानवरों में तब होता है जब ऊर्जा की मांग ऊर्जा की मात्रा से अधिक हो जाती है और इसके परिणामस्वरूप नकारात्मक ऊर्जा संतुलन होता है ।उच्च उपज देने वाली डेयरी गायों का कीटोसिस वैश्विक डेयरी फार्मिंग में सबसे महत्वपूर्ण स्वास्थ्य मुद्दों में से एक है, जिसके कारण कम दूध उत्पादन, कम गर्भाधान दर, उपचार लागत आदि से होने वाले आर्थिक नुकसान होते हैं । किटोसिस का एटिय लॉजिकल आधार इस तथ्य से संबंधित है कि गर्भावस्था के दौरान गायों का चयापचय विकासशील भ्रूण के अनुकूल होता है, जब कि प्रारंभिक स्तनपान के दौरान स्तन ग्रंथि उच्च चयापचय प्राथमिकता की होती है क्योंकि अधिकांश पोषक तत्व इसमें पुनर्निर्देशित होते हैं, जिसमें ग्लूकोज भी शामिल है – लैक्टोजेनेसिस के लिए एक मुख्य और आवश्यक तत्व ।

कीटोसिस के प्रकार :

केटोसिस को प्राथमिक और माध्यमिक के रूप में वर्गीकृत किया गया है, जो भोजन के सेवन और एक माध्यमिक बीमारी की उपस्थिति जैसे कि बनाए रखा प्लेसेंटा, मेट्राइटिस, मास्टिटिस और अन्य विकारों की उपस्थिति पर निर्भर करता है । कीटोसिस की विशेषताय कृत में ग्लाइकोजन की कमी और कम ग्लूकोनोजेनेसिस गति विधि, हाइपोग्लाइकेमिया, केटोनेमिया, केटोनुरिया, केटोलैक्टिया, एसीटोन–सुगंधित सांस और यकृत लिपिडोसिस के विकास से होती है ।

कीटोनबॉडी का संश्लेषण :

कीटोनबॉडी लीवर द्वारा निर्मित होती है और ग्लूकोज उपलब्ध नहीं होने पर ऊर्जा स्रोत के रूप में उपयोग की जाती है । कीटोनयाकीटोन बॉडी, जोएसिटोएसेटिक एसिड, 3–हाइड्रॉक्सी ब्यूट्रिक एसिड (जिसे ्–हाइड्रॉक्सी ब्यूट्रिक एसिड के रूप में भी जाना जाता है) औरएसीटोनसेबनाहै, पक्षियों और स्तन धारियों के चयापचय में महत्वपूर्ण यौगिक हैं और इनकी टोनबॉडी के बीच अंतर रूपांतरण हो सकता है । एक चौथा यौगिक, आइसोप्रोपेनॉल जुगाली करने वालों के लिए शामिल है ।

किटोसिस के लिए संवेदनशीलता :

किटोसिस के लिए संवेदन शीलता जानवरों की प्रजातियों के साथ–साथ उम्र और लिंग के साथ व्यापक रूप से भिन्न होती है । प्रजातियों के साथ संवेदन शीलता का घटता क्रम इस प्रकार है :

इंसान और बंदर बकरियां खरगोश और चूहे कुत्ते

कुत्तों को भुखमरी केटोसिस के लिए अत्यधिक प्रतिरोधी पाया गया है । पुरुषों की तुलना में महिलाएं भुखमरी केटोसिस का सामना करने में बहुत कम सक्षम हैं ।

केटोनिमिया का पैथोफिज़ियोलॉजी :

एसीटोएसेटेट और 3–हाइड्रॉक्सी ब्यूटाइरेट वाष्प शील फैटी एसिड की तुलना में अधिक शक्तिशाली एसिड होते हैं, और एसीटोएसेटेट के मामले में, वेलैक्टिक एसिड की तुलना में अधिक शक्तिशाली होते हैं । प्लाज्मा में कीटोन्स की एक उच्च सांद्रता के परिणामस्वरूप मेटाबॉलिक एसिडोसिस होता है जिसे कीटो एसिडोसिस कहा जाता है । घरेलू पशुओं में आमतौर

पर पाए जानेवाले सबसे महत्वपूर्ण कीटो एसिडोसिस मधुमेह और अंडाशय गर्भावस्था विषाक्त ता में हैं । इन सिंड्रोमों में सामने आनेवाले कीटो एसिडोसिस के कारण प्लाज्मा बाइकार्बोनेट 10 से नीचे हो सकता है और मृत्युदर में मुख्य योगदान कर्ता है । कुत्तों और बिल्लियों के मधुमेह में कीटो एसिडोसिस रक्त पीएच %.2 या उससे कम होने के साथ गंभीर हो सकता है ।

किटोसिस के लक्षण :

डेयरी मवेशियों में होने वाले कीटोसिस के दो प्रमुख रूप हैं बर्बादी और तंत्रिका रूप । बर्बाद करने का रूप बहुत अधिक सामान्य है ।

(1) कीटोसिस का व्यर्थ रूप :

शुरुआत में दो से पांच दिनों में भूख में धीरे–धीरे गिरावट आ सकती है। गायों द्वारा गंदगी और पत्थरों सहित किसी भी वस्तु को खाने से भूख कम लग सकती है । इस स्तर तक प्रभावित जानवर स्पष्ट रूप से बीमार है और हिलने–डुलने के लिए अनिच्छुक है, अपने पैरों पर डगमगा सकता है या अस्थिर हो सकता है, और सिर को अक्सर जमीन पर नीचे ले जाया जाता है । गाय का तापमान, नाड़ी और श्वसन दर काफी सामान्य रहती है । कोट दिखने में वुडी है, संभवतः त्वचा के नीचे वसा के भंडार के नुकसान के कारण । इस बीमारी में गाय द्वारा उत्पादित कीटोन्स में एक विशिष्ट मीठी बीमार गंध होती है, जो गाय की सांस पर और दूध के नमूनों में कम पाई जा सकती है ।

(2) किटोसिस का तंत्रिका रूप :

किटोसिस का यह रूप कम आम है । प्रभावित गाय कई तरह के लक्षण दिखा सकती हैं जिनमें स्पष्ट अंधापन, लक्ष्यहीन भटकना और जीभ की अजीब हरकतें शामिल हैं, जिससे त्वचा लगातार चाटती है । प्रभावित गाय भी बिना किसी स्पष्ट कारण के चक्कर लगा सकती हैं और जोर–जोर से चिल्ला सकती हैं ।

कीटोसिस का उपचार :

(ए) ग्लूकोज प्रतिस्थापन

डेक्सट्रोज समाधान का अंतः शिरा प्रशासन अल्पावधि में प्रभावी होता है, लेकिन अनुवर्ती उपचार आवश्यक है । प्रोपलीन ग्लाइकोल या ग्लिसरीन से भीगने से दीर्घकालिक प्रभाव पड़ता है । दो से चार दिनों तक उपचार जारी रखना चाहिए ।

(बी) हार्मोनल थेरेपी

लंबे समय तक काम करने वाले कई कॉर्टिको स्टेरॉइड्स का किटोसिस में लाभकारी प्रभाव पड़ता है । कॉर्टिको स्टेरॉइड्स में ग्लूकोज का उत्पादन करने के लिए मांसपेशियों में प्रोटीन को तोड़ने की क्षमता होती है, जो उदास रक्त शर्करा केस्तर को तुरंत भर देता है । कॉर्टिको स्टेरॉइड्स का उपयोग करते समय, मांस पेशियों के प्रोटीन के अत्यधिक टूटने को रोकने के लिए या तो उच्च कार्बोहाइड्रेट आहार और/या प्रोपलीन ग्लाइकोलड्रेंच के रूप में पर्याप्त मात्रा में ग्लूकोज की आपूर्ति करना महत्वपूर्ण है ।

कीटोसिस का नियंत्रण :

केटोसिस को होने से रोकने के लिए महत्वपूर्ण है, बजाय इसके कि मामलों को प्रकट होने पर इलाज किया जाए ।

रोकथाम पर्याप्त भोजन और प्रबंधन प्रथाओं पर निर्भर करता है ।

सूखे या अन्य कारणों से फ़ीड की कमी के समय, पर्याप्त मात्रा में कार्बोहाइड्रेट के साथ पूरक आहार का प्रावधान आवश्यक है । सबसे अच्छा चारा अच्छी गुणवत्ता वाली घास, साइलेज या अनाज के दाने होते हैं ।

ब्याने के समय डेयरी गाय के शरीर की स्थिति महत्वपूर्ण होती है । अच्छी स्थिति में बछड़े के उद्देश्य से गायों को पोषण के बढ़ते स्तर पर होना चाहिए ।

कभी–कभी, बहुत अधिक उत्पादन करने वाली गायों को हर साल कीटोसिस होने की आशंका रहती है । इन मामलों में ब्याने के तुरंत बाद प्रोपली नग्लाइकोल का एक निवारक ड्रेंचिंग कार्यक्रम व्यक्तिगत समस्या गायों में कीटोसिस को रोक सकता है ।

बाघ संरक्षण प्राकृतिक संतुलन एवं मानव विकास का समन्वय

डॉ. माधवी धैर्यकर, डॉ. अमोल रोकड़े
एस. डब्ल्यू. एफ. एच., नानाजी देशमुख पशु चिकित्सा विज्ञान विश्वविद्यालय, जबलपुर (म.प्र.)

भारत में बाघ एवं वन्य प्राणी संरक्षण एक प्राचीन परंपरा रही है, जो कि हमारी आस्था के साथ साथ पौराणिक एवं सांस्कृतिक महत्व भी रखता है। भारत में दुनिया की लगभग 17–18 जनसंख्या निवास करती है, जबकि उसके पास विष्व का 2.61 क्षेत्रफल है एवं इसमें भी 60ः से अधिक भारतीय हाथी, 75 : से अधिक बाघ, 100ः एषियाई षेर, 85ः से अधिक 1 सींग वाला गेडा एवं अन्य वन्यप्राणी अपने अस्तित्व के लिये संघर्ष कर रहे है। जुलाई 2019 सभी भारत वासियो के लिए गौरवषाली रहा, क्योकि भारत ने ग्लोबल टाईगर फोरम 2010 में सेंट पीटर्सबर्ग टाइगर समिट में बाघों की गिनती दोगुनी करने का जो लक्ष्य 2022 तक रखा था, भारत ने वह आयाम निर्धारित समय के पहले ही पूर्ण कर लिया है। अब लगभग दुनिया के 75 : से अधिक बाघ भारत के वनो में स्वछंद विचरण कर रहे है। इसी के साथ ही मध्यप्रदेष ने टाइगर स्टेट होने का दर्जा पुनः प्राप्त कर लिया है जो कि कर्नाटक से लगभग निकटतम है पारिस्थितिक तंत्र को सुचारू रूप से गतिमान बनाये रहने के लिये बाघ एवं वन्य प्राणी संरक्षण कितना जरूरी है ये बात किसी से छिपी नहीं है प्राकृतिक संतुलन बनाये रखने के लिए प्रत्येक जीव का अपना महत्व है परन्तु मनुष्यो द्वारा अंधाधुन्ध विकास इस संतुलन को बिगाड़ रहा है दुनिया से लगभग 3 प्रकार के बाघ पहले ही विलुप्त हो चुके है भारत में वन्य प्राणियों के सांस्कृतिक महत्व होने के बावजूद उन पर अत्याचार कम नही हुए है यवतमाल के अवनि बाघ को जिस प्रकार मारा गया और उस घटना ने पूरे विष्व को झकझोर के रख दिया था। मीडिया ने भी इस घटना को प्रमुखता दी थी, पर अवनि का बचाने के प्रयास नाकाफी साबित हुए। दि वाइल्ड लाइफ ट्रेड मानिटरिंग नेटवर्क ट्रेफिक एक अंतर्राष्ट्रीय संस्था है, जो कि विष्व में वाइल्डलाईफ ट्रेड इष्यू और जैव विविधता पर पड़ रहे मानवीय प्रभावों और दबावो पर अपना अनुसंधान करती है इसके अनुसार कोरोना के कारण देषव्यापी लोकडाउन में प्रतिवंधित वन्य क्षेत्रों में वन्य प्राणियों के अपराध में दुगनी से अधिक की वृद्धि हुई है केरल में गर्भवती हथनी को फल में विस्फोटक मिला कर मार देना अत्यंत दुखदायक रहा। वहीं पीलीभीत के पास एक निरीह बाघ की लाठियों से पीट पीटकर निर्मम हत्या ने मानवता को षर्मषार किया है, परंतु पिछले दषक में पन्ना एवं सरिस्का टाइगर रिजर्व में बाघो को पुनः स्थापित करना गौरवान्वित करता है। वर्ल्ड इकोनॉमी फोरम के अनुसार पिछले 50 वर्षो में दुनिया के 60 प्रतिषत जंगली जीव खत्म हुये है। मनुष्यों द्वारा जंगल में अत्यधिक हस्तक्षेप एवं वन्यप्राणियों के करीब आने से महामारीयों में भी कुछ दषको में अत्यधिक बढ़ोत्तरी हुई है एवं इस समय की वैष्विक समस्या बवअपक.19 इसी की उपज माना जा रहा है। इसके साथा ही इबोला, एड्स, सार्स जैसे वायरस इंसानें के लिए घातक सावित हुये है।

मध्यप्रदेष से उड़ीसा के सतकोसिया टाइगर रिजर्व में बाघों की पुर्नस्थापना करने का प्रयास विगत वर्ष में किये गए, परन्तु वह असफल रहा, पर हमें ऐसे प्रयास जारी रखने होंगे। हमारे पास लगभग 73,000 वर्ग किमी के क्षेत्र के साथ 50 टाइगर रिजर्व है। हालिया अखिल भारतीय बाघ जनगणना आँकलन 2019 के अनुसार देष में बाघो की आबादी में 2967 है जिसकी न्यूनतम एवं अधिकतम सीमा प्रवृत्ति क्रमषः 2603 और 3346 है। भारत ने अपना पहला राष्ट्रीय सर्वेक्षण 2006 में किया था एवं तब 1,411 बाघ थे जो बढ़कर 2011 में 1706, 2015 में 2226 हो गये थे। बाघों की निगरानी, टाइगर रिजर्व के अच्छे प्रबंधन और बाघ संरक्षण पर जागरूकता और षिक्षा ने बाघों की संख्या दुगुनी करने में महत्वपूर्ण कार्य किया है। परन्तु कुछ सरफिरों द्वारा बाघों का करंट लगाकर एवं जहरखुरानी करके मारना आज भी आम बात है। वन, पर्यावरण और जलवायु परिवर्तन मंत्रालय के आँकड़ों के अनुसार, 2019 में भारत में 95 बाघो की मौत हुई थी जिसमें से अवैध षिकार

की 22 घटनाएं हुई। पिछले कुछ वर्षो में बाघों को जहर देकर मारने के मामले भी पाए गए है। राष्ट्रीय बाघ प्राधिकरण ने बाघो के अवैध षिकार की घटनाओं के लिए इलेक्ट्रोक्यूषन को प्रमुख कारण माना है। पिछली सदी में लगभग 40000 के आस पास बाघ संपूर्ण भारत में स्वछंद विचरण कर रहे थे परन्तु आज वह लगभग 1: हिस्से में सिमट कर रह गये हैं। बाघ पारिस्थतिक खाद्य पिरामिड में सर्वोच्च उपभोक्ता है, और उनके संरक्षण के परिणामस्वरूप एक पारिस्थितिक तंत्र में सभी ट्रॉफिक स्तरों का संरक्षण होता है। आज हमारी पृथ्वी जलवायु परिवर्तन जैसी गंभीर समस्या से जूझ रही है। बाघ संरक्षण जलवायु परिवर्तन के विनाषकारी प्रभाव से बचने के लिए भी अत्यंत आवष्यक है। इसलिए बाघ बचाने से पारिस्थितिक रूप से पूरे जंगल और वन पारिस्थितिकीय तंत्र के अन्य सभी घटक बचे रहते है। हमारे संरक्षित क्षेत्रों से सैकड़ों नदियों का उदगम होता है, साथ ही हमारे जीवन के लिए ऑक्सीजन का मुख्य स्त्रोत हमारे वन ही हैं।

ग्लोबल टाइगर फोरम एक मात्र अंत:–सरकारी अंतर्राष्ट्रीय निकाय है, जो बाघ संरक्षण के लिए वैष्विक अभियान पर सदस्य देषों के साथ समन्वय स्थापित करता है। ग्लोबल टाईगर फोरम 2010 में सेंट पीटर्सबर्ग टाइगर समिट के लक्ष्य के अनुसार, भारत, बांग्लादेष, भूटान, कंबोडिया, चीन, इंडोनेषिया, लाओस, मलेषिया, म्यांमार, नेपाल, रूस, थाईलैंड और वियतनाम अपने बाघों की आबादी को 2022 तक दोगुना करने के प्रयासों के लिए सहमत हुए थे। नवीनतम बाघ जनगणना वृद्धि देष के वन्यजीव संरक्षण प्रयासों के लिए एक महत्वपूर्ण उपलब्धि है। भारत के साथ पड़ोसी देष नेपाल ने भी अपनी बाघों की संख्या को भी दुगना कर लिया है। भारत के 25–35 : बाघ अब भी टाईगर रिजर्व संरक्षित क्षेत्र के बाहर रहते हैं जिनकी सुरक्षा एवं जीवन यापन के बेहतर मौके उपलब्ध करना भी अत्यंत आवष्यक है। विषेषज्ञों के अनुसार बाघ सबसे अधिक असुरक्षित टाईगर रिजर्व के बाहर होते है क्योंकि वे सतत् निगरानी में नहीं होते हैं एवं ऐसे बाघ स्वछंद विचरण के लिए अधिक दूरी तय करते है, जिससे कि वह मानव आवादी के पास, कृषि क्षेत्र, राजमार्ग के पास विचरण करते रहते है एवं पषुधन पर निर्भर होते है। अंधाधुंध विकास, जनसंख्या वृद्धि, कृषि एवं पषुपालन क्षेत्र के विस्तार का दबाव हमारे संरक्षित वन क्षेत्रों पर है इन कारणों से वन सिकुडते जा रहे है एवं वन्यप्राणी क्षेत्रों में व्यवधान उत्पन्न हो रहे है। जिसके कारण बाघ एवं वन्यप्राणियों का मानव के साथ प्रतिस्पर्धा बढती जा रही है जिसके कारण मनुष्य एवं बाघों की मृत्यु की घटनाएँ सामने आ रही हैं। घटते हुए वन, अवैध षिकार, मानव–पषु संघर्ष की पारंपरिक चुनौतियों के साथ– साथ टाईगर कॉरिडोर को विकसित करने की चुनौतियाँ भी हैं। अब हम सब भारतीयां को साथ आकर ना सिर्फ बाघ संरक्षण बल्कि प्रत्येक वन्यप्राणी की सुरक्षा में आगे आना पडेगा बढ़ते हुए बाघों के लिए कोर एरिया से गॉवों के विस्थापन के साथ हमें नए टाईगर रिजर्व बनाने होंगे। वन्यप्राणियों को हमें पहले रास्ता देना होगा क्योंकि यह उनका अधिकार है। बाघों की आबादी में वृद्धि भारत के साथ पूरी दुनिया के लिए अच्छी खबर है, परन्तु बाघ अभी भी मानव जनसंख्या वृद्धि, षहरीकरण, मानव–वन्यजीव संघर्ष, घटते हुये प्राकृतिक आवास, षिकार, पर्यावरण प्रदूषण, अधिक सडको का निर्माण, संक्रामक बीमारियाँ षाकाहारी वन्यप्राणियों के आखेट एवं कई पारंपरिक चुनौतियो से संघर्ष कर रहा है। बाघ राष्ट्रीय पषु होने के साथ ऊर्जा, षक्ति, वन समृद्धि, बुद्धिमत्ता एवं धीरज का प्रतीक माना जाता है। भारतीय संस्कृति में हम बाघों को हजारों वर्षों से पूजते आ रहे है। प्रधानमंत्री श्री नरेंद्र मोदी ने अपने संबोधन में कहा था कि हमें स्थिरता और विकास के बीच एक स्वस्थ संतुलन बनाना होगा। अधिक सड़कों और स्वच्छ नदियों तथ नागरिकों के लिए अधिक घर और एक ही समय में प्राणियों के लिए गुणवत्ता वाले प्राकृतिक आवास एक मजबूत, समावेषी भारत के लिए आवष्यक हैं। अत: समय आ गया है कि भारत के राष्ट्रीय पषु को स्वछंद विचरण के सर्वश्रेष्ठ मौके उपलब्ध कराने होगे ताकि यह हमारे पर्यावरण संरक्षण के लिये वरदान साबित हो और यह हम सबके जीवन के लिये भी लाभकारी होगा।

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बार बार गाभिन कराने पर भी गर्भ न रुकना

डा0 के0 पी0 सिंह1 और डा0 प्रणीता सिंह'2
1. पशु चिकित्साधिकारी, राजकीय पशु चिकित्सालय, देवरनियाँ बरेली उ0प्र0
2. सहायक प्राध्यापक, पशुधन उत्पाद, प्रौद्योगिकी विभाग पशु चिकित्सा एवं पशु विज्ञान महाविद्यालय, गो0 ब0 पन्त कृषि एवं प्रौद्योगिक विश्वविद्यालय, पन्तनगर, ऊधम सिंह नगर, उत्तराखण्ड

भारत एक कृषि प्रधान देश है। जिसने कृषि के साथ–साथ पशुपालन को एक संलग्न व्यवसाय के रूप में अपना रखा है। निरन्तर जनसंख्या बढने के कारण मानव जाति जंगलों को काटकर तथा कृषि योग्य भूमि मे घर बनाकर रहना शुरु कर दिया है। इसके फलस्वरुप खेती योग्य भूमि की निरन्तर कमी होती जा रही है। पशुपालकों के अथक प्रयास से भारत देश लगभग 199 मिलियन टन दुग्ध उत्पादन कर विश्व में प्रथम स्थान पर विराजमान है और लगातार सर्वाधिक दुग्ध उत्पादन कर रहा है। उन्नत पशुपालन व्यवसाय के लिए यह आवश्यक है कि हमारे दुधारू पशु सही समय पर गर्मी में आए एवं गाभिन हो। यदि पशु गर्मी में आने पर गाभिन कराने के पश्चात 21 दिनों में दुबारा गर्मी में आ जाए तो यह पशुपालकों के लिए चिंता का विषय है। यह स्थिति न सिर्फ दुग्ध उत्पादन को कम करती है, पशुओं से प्राप्त होने वाले बछड़ों/बछिया की संख्या को घटाती है अपितु अतिरिक्त चारे एवं पशु आहार से पशुपालक को आर्थिक हानि पहुँचाती है।

मादा पशुओं को बार–बार गाभिन कराने के बावजूद भी गर्भ न रुकना एक बहुत बड़ी समस्या है। रिपीट ब्रीडिंग की प्रभाव सीमा भैंसों में 20–25 प्रतिशत तक देखी गई है। बार–बार कृत्रिम सेंचित कराने पर भी गर्भ न रुकने की समस्या भी मुख्यतः दो कारणों से हो सकती है।

1. नवजात भ्रूण की मृत्यु
2. समय पर निषेचन न हो पाना

यह समस्या मादा के जननांगों की संरचना, जन्मजात विकार, शुक्राणु, अण्डाणु एवं भ्रूण में विकार, जननांगों में किसी प्रकार की चोट व रोग, हार्मोन का असंतुलन, संक्रामक कारक, पोषक तत्वों की कमी, प्रबन्ध सम्बन्धित कारक आदि में से किसी भी वजह से उत्पन्न हो सकती है।

जननांगों की संरचना

- अंडाशय का छोटा होना।
- जननग्रंथियों की अनुपस्थिति।
- जननलिका का अवरुद्ध होना।
- योनि के रास्ते में किसी भित्तीय झिल्ली का पाया जाना।
- बच्चेदानी मे इन्डोमेट्रियल ग्रंन्थि का न होना।
- ग्रीवा (सरविक्स) का अनुपस्थित होना।
- ग्रीवा मे दो मुख का होना।
- अंड़ाशय तथा अंडवाहिनी में घाव।
- बच्चेदानी का किसी अन्य भाग से जुड जाना।

- बच्चा देते समय जनन रास्ते मे चोट लग जाना।
- गुदा एवं भग के बीच के भाग का फट जाना।
- व्याने के समय भग का छिल जाना।
- ग्रीवा का मोटा हो जाना।
- योनि का मोटा हो जाना।
- मादा जनन अंगों में कैंसर हो जाना।

हार्मोन का असंतुलनः ऋतु चक्र विशेष हार्मोन्स के प्रभाव से संचालित होता है। इन हार्मान्स के स्राव से किसी भी प्रकार के गर्भाधान से पशु के ऋतु चक्र में असमानता व जनन में अयोग्यता पायी जाती है।

संक्रामक कारकः प्रसव के तुरन्त पश्चात तथा पशु के गर्मी का समय इस प्रकार के संक्रमण का उपयुक्त समय है क्योकि इसी समय पशु की जनन नलिका खुली होती है। कृत्रिम गर्भाधान के दौरान उपयोग मे लाये जाने वाले सामानो की सफाई ठीक से न होने पर तथा प्रसव के उपरान्त साफ सफाई न रखने पर विभिन्न प्रकार के जीवों का संक्रमण बच्चेदानी में हो जाता है। जिससे ब्रुसेलोसिस, विब्रियोसिस, ट्राइकोमोनिएसिस, इन्डोमेट्राइटिस, पायोमेट्रा आदि रोग उत्पन्न हो जाता है ।

पोषक तत्वों की कमीः प्रोटीन, कार्बोहाइड्रेट, विटामिन तथा मिनरल की कमी से पशु व्याने के बाद गर्मी में देर से आता है तथा गर्भधारण दर घट जाती है। विटामिन ए की कमी से गर्भपात, कमजोर या मृत बछड़ों का जन्म और जेर रुकने की समस्या हो जाती है। विटामिन बी की कमी से एनीमिया हो जाता है जो पशुओं में बॉझपन उत्पन्न करता है। फास्फोंरस, कैल्सियम तथा मैग्नीशियम की कमी से पशु यौवन में देर से आता है तथा मरे हुए बच्चे पैदा होते है। कापर तथा आयरन की कमी से पशु देर से यौवन मे आता है। तथा आयोडीन की कमी से गर्भपात, मृत बछडों का जन्म आदि की समस्या रहती है। सीलिनियम की कमी से जेर का रुकना, बच्चेदानी में शोथ तथा ओवरी पर गॉठ बनने की समस्या हो जाती है।

प्रबन्धकीय कारकःगर्मी का पता ठीक से न लग पाना तथा कृत्रिम गर्भाधान का समय पर न होना रिपीट ब्रीडिंग का कारण बनता है।

उपचार :

जननांगों की जॉच तथा पशु के स्राव की जॉच पशु चिकित्सक से करवाना अति आवश्यक है जिससे उचित इलाज किया जा सकता है। जननांगों में संक्रमण की अवस्था में उसके स्राव का एंटीबायोटिक सुग्राही परीक्षण करवाकर उपयुक्त एंटीबायोटिक को गर्भाशय में डालना चाहिए। आजकल के वर्षों में निम्न स्तर के गर्भाशय पेशी शोथ की चिकित्सा के लिए कुछ प्रतिरोधक क्षमतावर्धक दवाओं जैसे– लाइपोपोलीसेकराइड्स तथा लेवामीसोल का प्रयोग प्रभावी ढंग से किया जा रहा है। यदि पशुओं में रिपीट ब्रीडिग निम्नस्तरीय गर्भाशय पेशीशोथ के कारण है तो इन दवाओं का प्रयोग लाभदायक सिद्ध हो सकता है। यदि देर से डिम्बक्षरण की वजह से मादा पशु बार–बार गर्मी पर आती है तो ऐसी स्थिति में कोरुलान (1500–3000 आई0यू0) का इंजेक्शन समय से डिम्बक्षरण कराने में असरदार पाया गया है। अच्छी प्रबंध व्यवस्था से रिपीट ब्रीडिग की समस्या को काफी हद तक कम किया जा सकता है। पशु को संतुलित आहार देना चाहिए, समय पर कृमिनाशक दवापान कराना बीमारी से बचाव के लिए टीका लगाना तथा दिन में दो बार सुबह–शाम पशुओं का गर्मी के लक्षणों के लिए ध्यान देना तथा उपयुक्त समय पर उच्च गुणवत्ता वाले वीर्य से गर्भाधान कराने पर इस समस्या की प्रभाव सीमा को काफी कम कर सकते हैं।

भारत में डेयरी फार्मिंग की आवश्यकता एवं उसका भविष्य

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भारत को दुनिया में सबसे बड़े दूध उत्पादक के रूप में जाना जाता है। भारतीय बाजारों में गाय और भेंस के दूध के अलावा बकरी और ऊँट का दूध भी उपलब्ध है। पिछले पाँच वर्षो के दौरान भारत में दूध का उत्पादन 6.4 फीसदी बढ़ा है। जुलाई 2020 की रिपोर्ट के अनुसार वर्तमान में 188 मिलियन टन दूध उत्पादन किया जा रहा है और 2024 तक दूध उत्पादन बढ़कर 330 मिलियन टन तक होने की संभावना है। अभी केवल 20–25 फीसदी दूध प्रसंस्करण क्षेत्र के अंर्तगत आता है, और सरकार की कोशिश इसे 40 फीसदी तक ले जाने की है। देश में दूध उत्पादन बढ़ाने के लिए मत्स्यपालन पशुपालन और डेयरी मंत्रालय की ओर कई योजनाएँ भी चलाई जा रही है। परंतु इन्ही सभी कार्यक्रमों के बीच कोविड–19 महामारी ने दुग्ध उत्पादको की स्थिति को बदतर कर दिया है। महामारी के दौरान शहरी शहरी और ग्रामीण दोनों क्षेत्रों में परिवारों द्वारा दूध की घर–घर बिक्री स्वतः बंद हो गई थी जिससे किसानों को डेयरी उत्पादन नजदीक के डेयरी सहकारी समितियों को बहुत कम कीमत पर बेचने के लिये मजबूर होना पड़ रहा है। इसके अलावा, दुकानों के बंद होने से दूध और दूध उत्पादों की मांग में कमी आई है, जबकि पशुओं के चारे की भारी कमी ने लागत को बढ़ा दिया है। साथ ही, कोविड–19 के कारण निजी पशु चिकित्सा सेवाएँ लगभग बंद हो गई हैं, जिससे दुधारू पशुओं की मौत हो रही है। भारत में दूध के उत्पादन और बिक्री की प्रकृति को देखते हुए दुग्ध उत्पादकों को मामूली झटके भी लग सकते हैं क्योंकि दूध और दुग्ध उत्पादों की मांग उपभोक्ताओं के रोज़गार और आय में बदलाव के प्रति संवेदनशील है। इसलिये भारतीय अर्थव्यवस्था के इस महत्त्वपूर्ण क्षेत्र को बचाने के लिये बहुत कुछ करने की जरूरत है।

पिछले 10 वर्षों में, भारत में पशुपालको का डेयरी फार्मिंग में अप्रत्याशित रुझान देखा गया है। अत्याधुनिक उपकरण और उन्नत पशुओं की नस्ल के हजारों नए डेयरी फार्म खोले गए हैं। हालांकि, लंबे समय से इनमें से आधे से भी कम डेयरी फार्म टिकाऊ साबित हुए हैं। इस लेख का उद्देश्य है कि इतनी संख्या में डेयरी फार्मा का विफल होना, विफलता के कारणों का विश्लेषण करना तथा भविष्य में एक आधुनिक डेयरी फार्म को कैसे ठीक किया जा सकता है, यही इस लेख का मुख्य उद्देश्य है।

डेयरी फार्मिंग की जानकारी

डेयरी फार्मिंग की वर्तमान प्रवृत्ति को अपनाने के लिए लोगों का चुनाव करने के लिये उन्हें मोटे तौर पर चार समूहों में विभाजित किया जा सकता है। सबसे पहले, कुछ स्थानीय लोग नए डेयरी फार्म शुरू करने के लिए वित्तीय साधनों का प्रबंधन करते हैं। दूसरे, ऐसे एनआरआई (छत्प्) हैं जो अपनी अधिशेष आय का चयन कृषि क्षेत्र में निवेश करने में करते हैं। तीसरे समूह में युवा शहरी पेशेवर शामिल हैं जो अपनी दैनिक नौकरी के साथ असंतोष बढ़ने के कारण डेयरी फार्मिंग की ओर वापस लौटना चाहते हैं। अंत में, चौथा समूह बेरोजगार, लेकिन उच्च–मध्यम वर्गीय परिवारों के शिक्षित युवाओं से बना है, जो एक वैकल्पिक पेशा चाहते हैं। इनमें से किसी भी समूह को पहले कभी भी डेयरी फार्मिंग का अनुभव नहीं था और आधुनिक तकनीक और

उपकरणों का ज्ञान तब तक नहीं होता जब आपको मवेशियों की आवश्यक समझ नहीं होती।

डेयरी फार्मिंग की उन्नत कृषि में आवश्यकता

अधिकांश अन्य प्रकार की खेती की तरह डेयरी फार्मिंग एक व्यवसाय नहीं है बल्कि एक आजीविका है। डेयरी फार्मिंग के लिए ज्ञान, धैर्य और बहुत हद तक जुनून की आवश्यकता होती है। नए डेयरी किसान विशेष रूप से यह समझने में विफल रहते हैं कि वे मशीनों से नहीं बल्कि जीवित पशुओं के साथ काम कर रहे हैं। बड़े परिणाम के लिए छोटे पैमाने पर कई उच्च तकनीक व आधुनिक डेयरी फार्म वाले शुरुआत में विशाल पैमाने पर डेयरी फार्म शुरू करने की गलती करते हैं। वे बड़े पैमाने पर शेड का निर्माण करते हैं और शुरुआत में ही बड़ी संख्या में पशुओं को खरीदते हैं। जब आप डेयरी फार्मिंग के लिए नए हैं तो अधिक संख्या में पशओ का प्रबंधन करना बहुत मुश्किल है। एक बार में अधिक संख्या में पशुओ को खरीदने के बजाय, आपको नियमित मासिक दूध की उपलब्धतता बनाए रखने के लिए अपने मवेशियों की खरीद को कम करना चाहिए।

पशु की जैविक क्रियाओं का ज्ञान

कई नए किसान अपने मवेशियों के जीव विज्ञान को समझने के बजाय पूरी तरह से दूध देने और प्रसंस्करण की प्रक्रिया पर ध्यान केंद्रित करते हैं। उनमें से ज्यादातर को पशु के ताव में आने, या कि पशु को 4 या 5 वें महीने में गर्भधारण करना चाहिए, का पता ही नहीं लगता हैं। ऐसे मामले भी सामने आए हैं जिनमें बड़ी संख्या में दुधारू पशुओं के फार्म में एक भी बैल नहीं था और वे कृत्रिम गर्भाधान के लिए स्थानीय सरकारी पशु चिकित्सकों पर निर्भर थे परिणामस्वरूप लंबे समय तक पशु के ताव में आने का पता नहीं लगने के कारण कुछ ही पशु दूध देने लायक रहते हैं। बड़ी संख्या में गैर–दूध देने वाली गायों को खिलाने के लिए लंबी अवधि में भारी नुकसान हो सकता है।

पशु की देखभाल

कई आधुनिक डेयरी फार्म बछड़ों की उचित देखभाल के अभाव में विफल हो गए हैं। प्राय 100 से अधिक दुधारू पशुओं के फार्म में केवल 20–30 बछड़े ही वयस्कता तक जीवित रहने में कामयाब रहे हैं। बछड़ों की देखभाल करना डेयरी फार्म के दीर्घकालिक कल्याण के लिए बेहद महत्वपूर्ण है। मादा बछड़े विशेष रूप से डेयरी फार्म के लिए मूल्यवान हैं, क्योंकि वे 3–4 साल के भीतर दूध देना शुरू कर देते हैं।

उचित चारे की व्यवस्था

कई किसानों ने दुग्ध उत्पादन के प्रारंभिक चरण के दौरान अच्छा चारा प्रदान किया। हालाँकि, जब 5 या 6 महीने के बाद दूध की पैदावार कम होने लगी, तो किसानों को जो चारा और चारा उपलब्ध कराया गया था, उसे कम करने की कोशिश की गई कभी–कभी तो इतनी भारी मात्रा में कि पशु का आकार भी आधा हो गया। जबकि आवश्यक फीड की मात्रा पशु के दूध की उपज के साथ– साथ शरीर के वजन पर भी निर्भर है और किसी भी कारण से इसमें कभी भी कटौती नहीं की जानी चाहिए। किसी भी पोषण संबंधी असंतुलन से दीर्घकालिक में गंभीर स्वास्थ्य और प्रजनन संबंधी समस्याएं हो सकती हैं।

संतुलन की आवश्यकता

अधिकांश नए फार्म मालिक अपने डेयरी फार्म को पूरी तरह से स्वचालित करना चाहते हैं। दूध देने वाली मशीनरी के लिए

हाथ से दूध देने वाले मवेशियों को पालना एक परीक्षण–दर–त्रुटि प्रक्रिया है जिसमें समय और धैर्य की आवश्यकता होती है। जब यह तुरंत काम नहीं करता है, तो किसान अक्सर अपनी दूध देने वाली मशीनों को छोड़ देते हैं जो कि पैसे की भारी बर्बादी है। यह उन्हें पूरी तरह से श्रमिकों की दया पर रखता है जो बिना किसी सूचना के छोड़ सकते हैं। डेयरी फार्म की दीर्घकालिक सफलता के लिए स्वचालन और श्रम के बीच संतुलन बनाना बेहद जरूरी है।

प्रबंधन की उचित व्यवस्था

कई मालिक डेयरी फार्म की देखभाल करने के लिए दूसरों पर निर्भर रहते हैं, जिन्हें स्वयं डेयरी फार्मिंग का अधिक ज्ञान नहीं होता है। डेयरी फार्मिंग के लिए मालिक का ध्यान 24 घंटे, सप्ताह में 7 दिन और वर्ष के 365 दिन मालिक के ध्यान की आवश्यकता होती है। दूसरे आपके लिए ऐसा नहीं कर पाएंगे। यदि आप अपने खेत पर समय नहीं बिता सकते हैं (कम से कम जब तक डेयरी फार्मिंग संचालन स्थिर नहीं हो जाता है), कृपया डेयरी फार्मिंग में न जाएं।

डेयरी फार्म की दीर्घकालिक प्रतिबद्धता

कई नए आधुनिक डेयरी फार्म उन लोगों द्वारा शुरू किए गए हैं जिनके पास अधिशेष नकदी है जिसे वे खो सकते हैं, और पूर्णकालिक व्यवसायों के लिए वे अपनी मुख्य आय के लिए भरोसा कर सकते हैं। जब चीजें अच्छी तरह से नहीं चलती हैं जो कि अक्सर डेयरी फार्मिंग के शुरुआती चरणों के दौरान होती हैं तो वे फार्म को बंद कर देते हैं और पशुओं को वध के लिए भेज देते हैं। डेयरी फार्म के लिए दीर्घकालिक रूप से सफल होने के लिए, शुरुआती असफलताओं के माध्यम से धक्का देना और चीजों को काम करने के लिए प्रतिबद्ध करना महत्वपूर्ण है। एक आसान निकास, या एक पूर्णकालिक नौकरी, जो आपका सबसे अधिक ध्यान देने की मांग करती है, एक प्रोत्साहन है लेकिन फार्म को अपनी आजीविका या प्राथमिक जुनून के स्रोत के रूप में मानने से आपको इसे लंबे समय में काम करने के लिए प्रेरित करने में मदद मिल सकती है।

लाभ

साल 2015–16 के दौरान किए गए एक आर्थिक सर्वेक्षण के मुताबिक दूध उत्पादन में भारत पहले स्थान पर है. भारत विश्व में होने वाले दूध उत्पादन का 18.5: हिस्सा उत्पाद करता है. जिसका मतलब ये है कि इस व्यापार की मांग हमारे देश में काफी है. वहीं दूध एक ऐसा उत्पाद है जिसका निर्यात करके भी आप पैसे कमा सकते हैं. वहीं अभी हाल ही में भारत सरकार द्वारा पेश की गई एक रिपोर्ट के मुताबिक साल 2014 से लेकर साल 2017 तक डेयरी किसानों की आय में 23.77: की बढ़ोत्तरी दर्ज की गई है. इतना ही नहीं साल 2013–14 की तुलना में साल 2016–17 में देश के दूध के उत्पादन में 20.12: की बढ़त हुई है. इस बात से अनुमान लगाया जा सकता है कि इस व्यापार से ना केवल दूध की बल्कि इससे जुड़े किसानों की भी आय में अच्छी खासी वृद्धि हुई है। कच्चे दूध के अलावा भी एक बहुत बड़ा मार्केट है मिल्क प्रोडक्ट्स का जैसे की मिल्क पाउडर, घी, चीज़ इत्यादि। यहाँ तक की डेयरी फार्म का वेस्ट तक बहुत उपयोगी है और इसका मार्केट में डिमांड भी अच्छी है। गोबर या काऊ डंग आर्गेनिक कम्पोस्ट या वर्मीकम्पोस्ट में उपयोग होने वाला पदार्थ है। अगर आप अपने गौशाला में देसी गाय या इंडियन ब्रीड है तो गाय का यूरिन (गौमूत्र) भी एक उपयोगी प्रोडक्ट है। इसका इस्तेमाल पंचगव्य बनाने के लिए होता है जो की आर्गेनिक फार्मिंग मे नेचुरल कीटनाशक के रूप में प्रयोग होता है। इस बिज़नेस में कम से कम 40: का प्रॉफिट मार्जिन है जो की आपकी मेहनत के साथ बढ़ता रहता है।

आधुनिक तकनीक की आवश्यकता

करनाल में नई बछड़े की ब्रीड विकसित की गई है। जो अधिक दुग्ध उत्पादन में सहायक है। खेत पर निर्भर आबादी में वैसे किसान और खेतिहर मज़दूर भी शामिल हैं जो डेयरी और पशुधन पर निर्भर हैं। इनकी संख्या लगभग 70 मिलियन है। इसके अलावा मवेशी और भैंस पालन में कुल कार्यबल 7.7 मिलियन में 69 प्रतिशत महिला श्रमिक हैं। कृषि से सकल मूल्य वर्धित (जीवीए) में पशुधन क्षेत्र का योगदान 2019–20 में 28 प्रतिशत था। दुग्ध उत्पादन में प्रति वर्ष 6 प्रतिशत की वृद्धि दर से किसानों को सूखे और बाढ़ के दौरान एक बड़ा आर्थिक सहारा प्राप्त होता है। प्राकृतिक आपदाओं के कारण फसल खराब होने पर दूध का उत्पादन बढ़ जाता है क्योंकि किसान तब पशुपालन पर अधिक निर्भर होते हैं।

चुनौतियाँ

* किसान के लिये पाँच में से दो दुधारू पशु आजीविका के लिये रखते हैं। ऐसे में परिवार के उपयोग हेतु दुग्ध उत्पादन के लिये आवश्यक श्रम परिवार की अवैतनिक या औपचारिक रूप से बेरोज़गार महिलाओं के हिस्से आता।
* उनमें से भूमिहीन और सीमांत किसानों के पास दूध के लिये खरीदारों की कमी होने पर आजीविका का कोई विकल्प नहीं है।
* डेयरी क्षेत्र की असंगठित प्राकृतिक गन्ना, गेहूं और चावल उत्पादक किसानों के विपरीत पशुपालक असंगठित हैं और उनके पास अपने अधिकारों की वकालत करने के लिये राजनीतिक ताकत नहीं है।
* हालाँकि उत्पादित दूध का मूल्य भारत में गेहूं और चावल के उत्पादन के संयुक्त मूल्य से अधिक है लेकिन उत्पादन की लागत और दूध के लिये न्यूनतम समर्थन मूल्य का कोई आधिकारिक प्रावधान नहीं है।
* भले ही डेयरी सहकारी समितियाँ देश में दूध के कुल विपणन योग्य अधिशेष में लगभग 40 प्रतिशत का योगदान करती हैं, लेकिन वे भूमिहीन या छोटे किसानों का पसंदीदा विकल्प नहीं हैं। ऐसा इसलिये है क्योंकि डेयरी सहकारी समितियों द्वारा खरीदा गया 75 प्रतिशत से अधिक दूध अपने न्यूनतम मूल्य पर है।
* अगस्त 2020 में विभाग ने भारत में 2.02 लाख कृत्रिम गर्भाधान (।तजपपिबपंस पदेमउपदंजपवद ।प्) तकनीशियनों की आवश्यकता की सूचना दी, जबकि उपलब्धता केवल 1.16 लाख है।
* किसान क्रेडिट कार्ड कार्यक्रम में डेयरी किसानों को शामिल किया गया है। भारत में 230 दुग्ध संघों के कुल 1.5 करोड़ किसानों में से अक्टूबर 2020 तक डेयरी किसानों के ऋण आवेदनों का एक–चौथाई भी बैंकों को नहीं भेजा गया था।
* किसानों को कोविड–19 के कारण आय के नुकसान की भरपाई के लिये डेयरी को मनरेगा के तहत लाया गया था। हालाँकि 2021–22 के लिये बजटीय आवंटन में 34.5 प्रतिशत की कटौती की गई थी।

डेयरी फार्मिंग का भविष्य

* पशुओं की उत्पादकता बढ़ाने, बेहतर स्वास्थ्य देखभाल और प्रजनन सुविधाओं और डेयरी पशुओं के प्रबंधन की आवश्यकता है। इससे दूध उत्पादन की लागत कम हो सकती है।
* साथ ही पशु चिकित्सा सेवाओं, कृत्रिम गर्भाधान (।तजपपिबपंस पदेमउपदंजपवद ।प्), चारा और किसान शिक्षा की

उपलब्धता सुनिश्चित करके दूध उत्पादन और उत्पादकता को बढ़ाया जा सकता है। सरकार और डेयरी उद्योग इस दिशा में अहम भूमिका निभा सकते हैं।

* यदि भारत को डेयरी निर्यातक देश के रूप में उभरना है, तो उचित उत्पादन, प्रसंस्करण और विपणन बुनियादी ढाँचे को विकसित करना अनिवार्य है, जो अंतर्राष्ट्रीय गुणवत्ता आवश्यकताओं को पूरा करने में सक्षम है।
* इस प्रकार गुणवत्ता और सुरक्षित डेयरी उत्पादों के उत्पादन के लिये एक व्यापक रणनीति की आवश्यकता है। इसके लिये उपयुक्त कानूनी ढाँचा भी बनाना चाहिये।
* इसके अलावा ग्रामीण क्षेत्रों में बुनियादी ढाँचे की कमी को दूर करने और बिजली की कमी को दूर करने के लिये, सौर ऊर्जा संचालित डेयरी प्रसंस्करण इकाइयों में निवेश करने की आवश्यकता है।
* साथ ही डेयरी सहकारिता को मजबूत करने की जरूरत है। इस प्रयास में, सरकार को किसान उत्पादक संगठनों को बढ़ावा देना चाहिये।

निष्कर्ष

पिछले कुछ दशकों में डेयरी क्षेत्र भारत में ग्रामीण अर्थव्यवस्था की जीवन रेखा के रूप में उभरा है। हालाँकि दूध और दुग्ध उत्पादों की उच्च कीमत में अस्थिरता को देखते हुए डेयरी क्षेत्र ग्रामीण अर्थव्यवस्था के सबसे कमजोर क्षेत्रों में से एक बन गया है। इसलिये किसानों और उपभोक्ताओं दोनों के लिये डेयरी क्षेत्रों के महत्त्व को देखते हुए इस संकट को दूर करने और क्षेत्र के समग्र विकास हेतु एक समग्र ढाँचा स्थापित करने के लिये विभिन्न स्तरों पर कार्य करने की आवश्यकता है।

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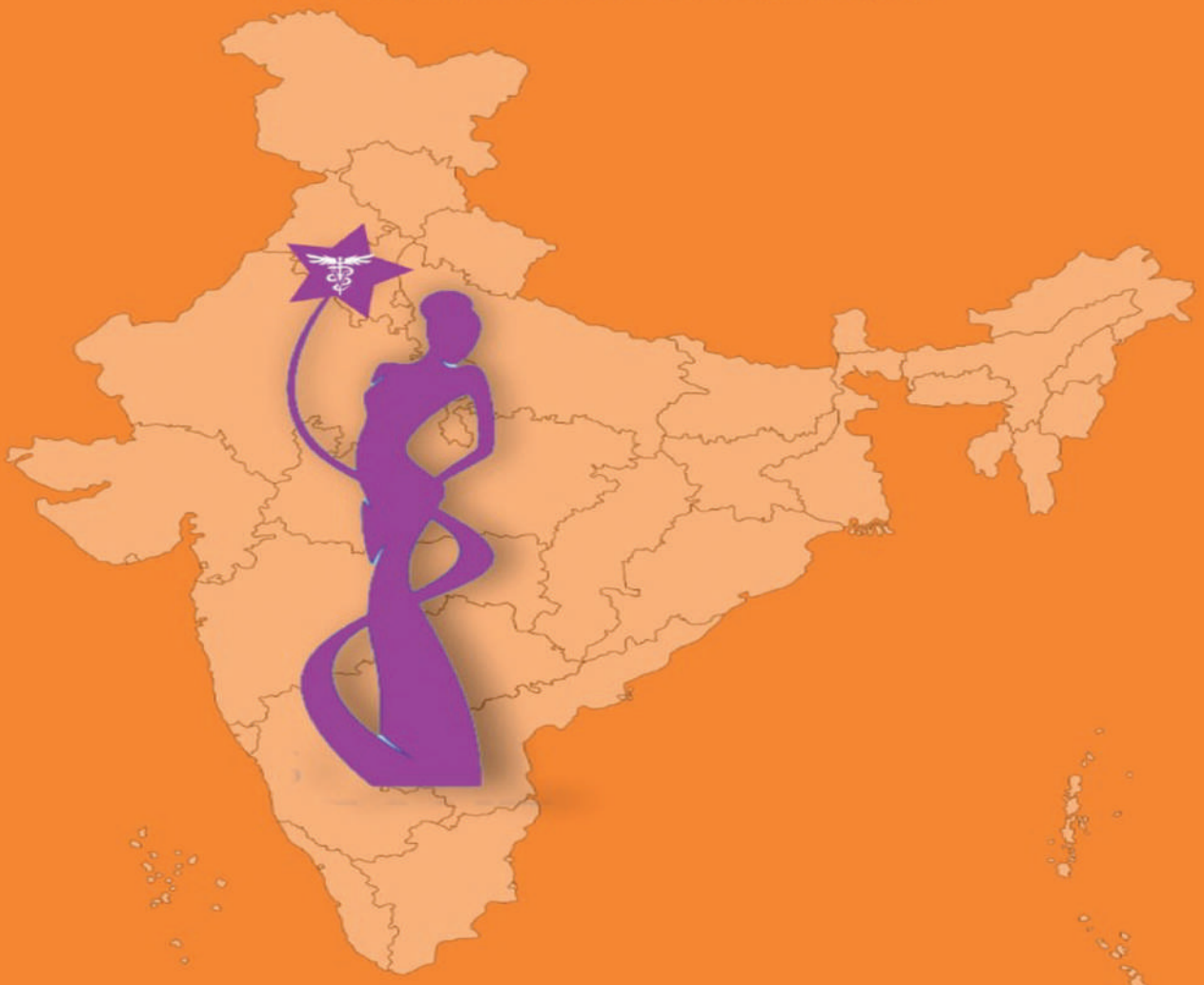

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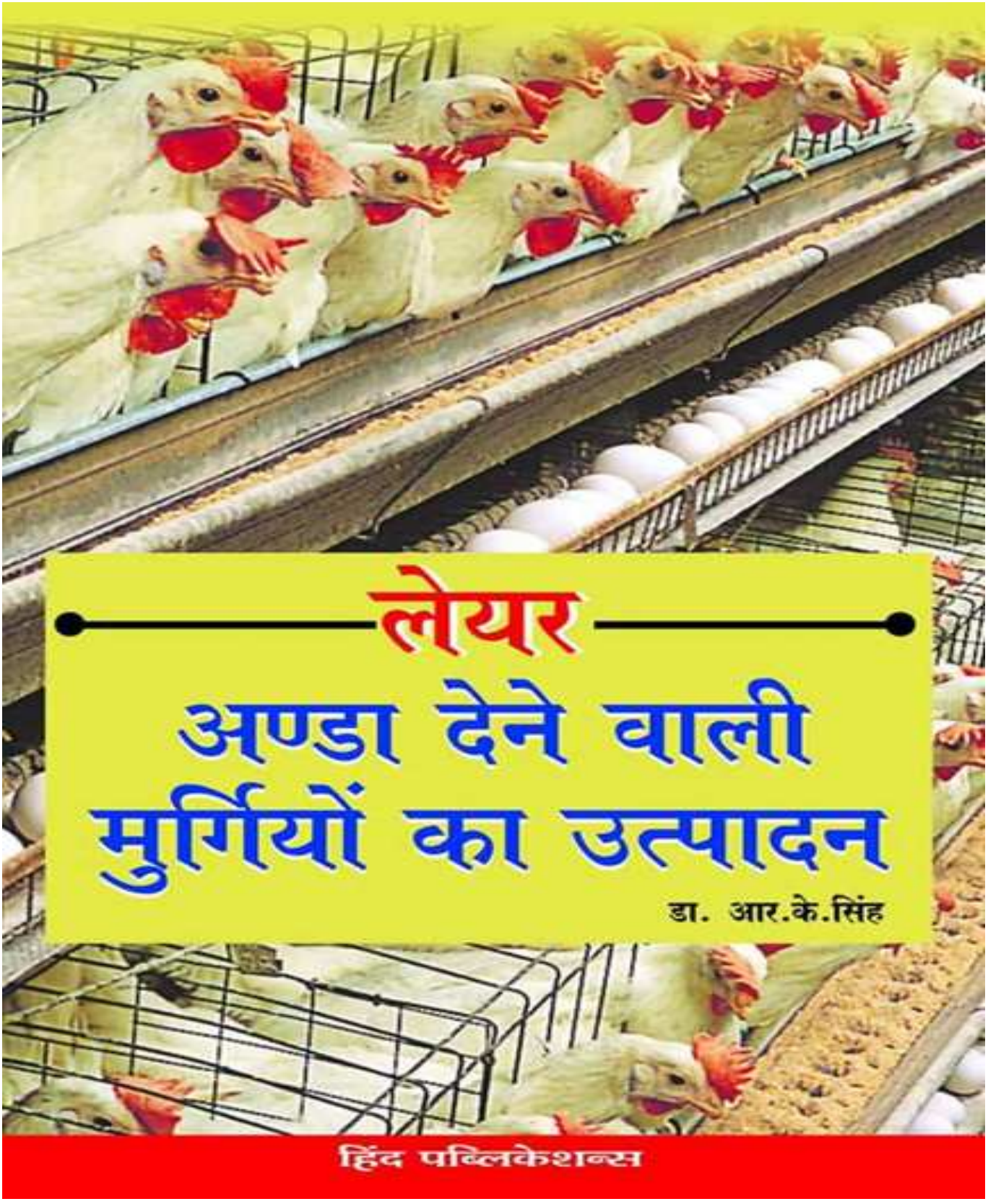
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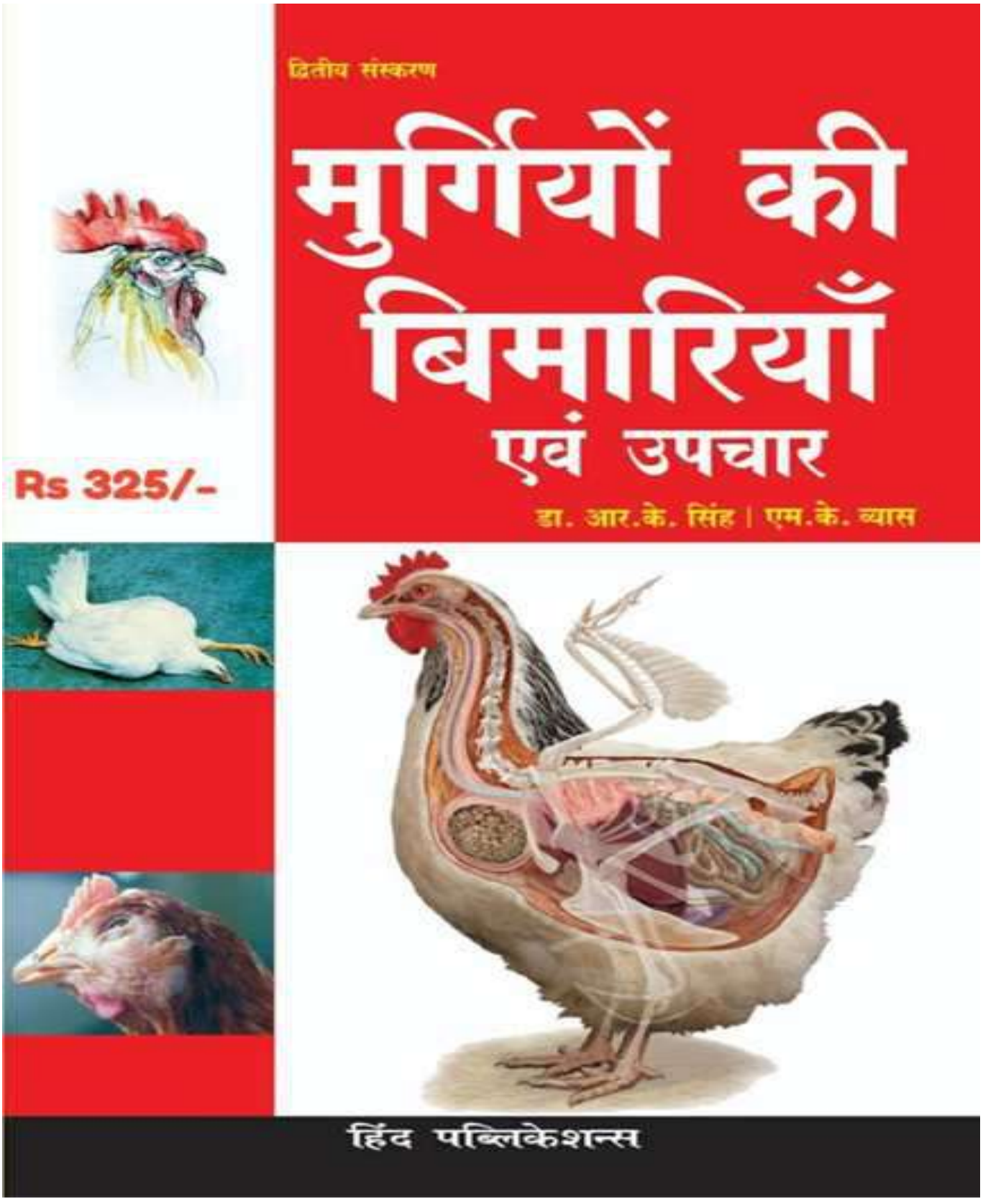
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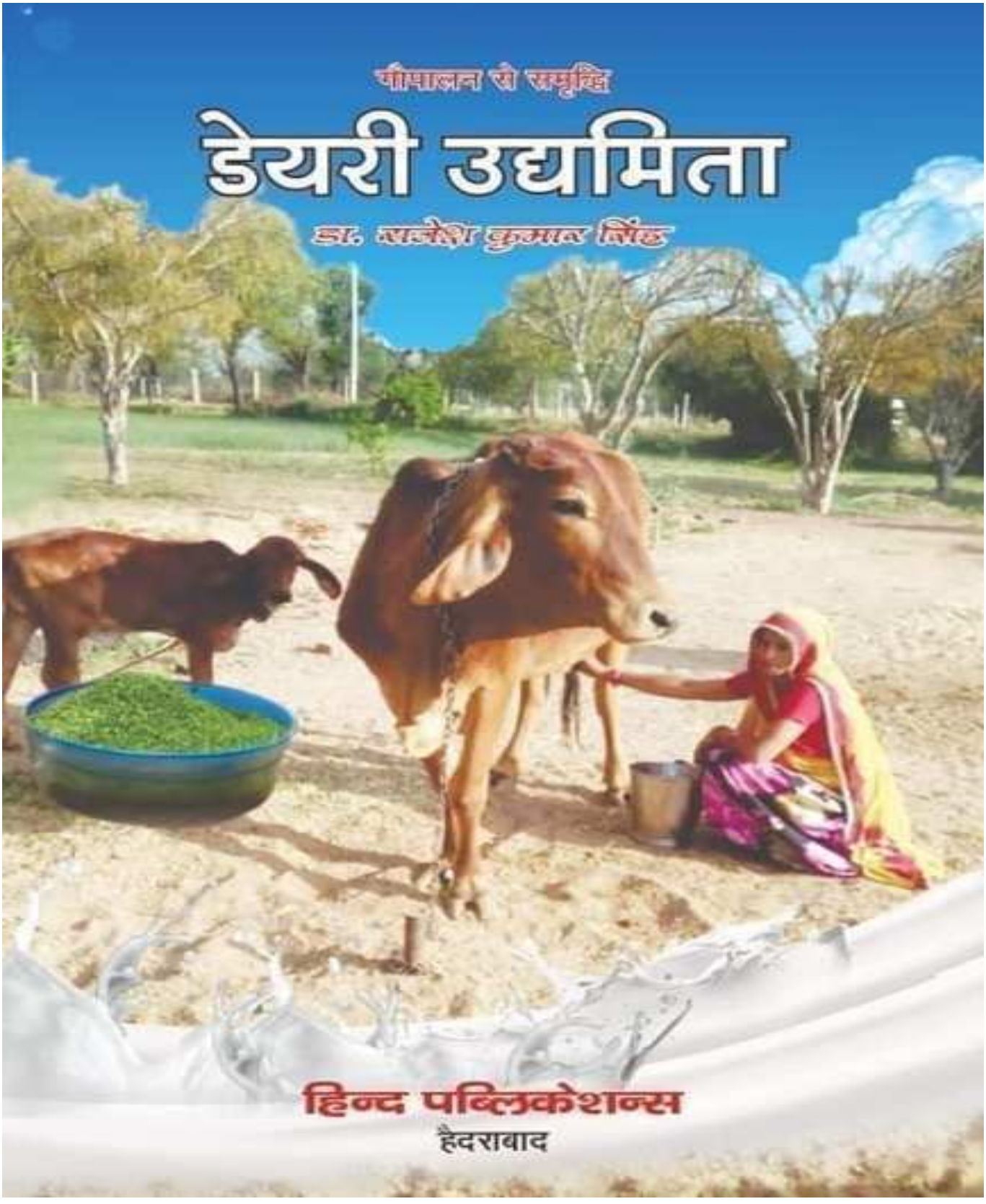
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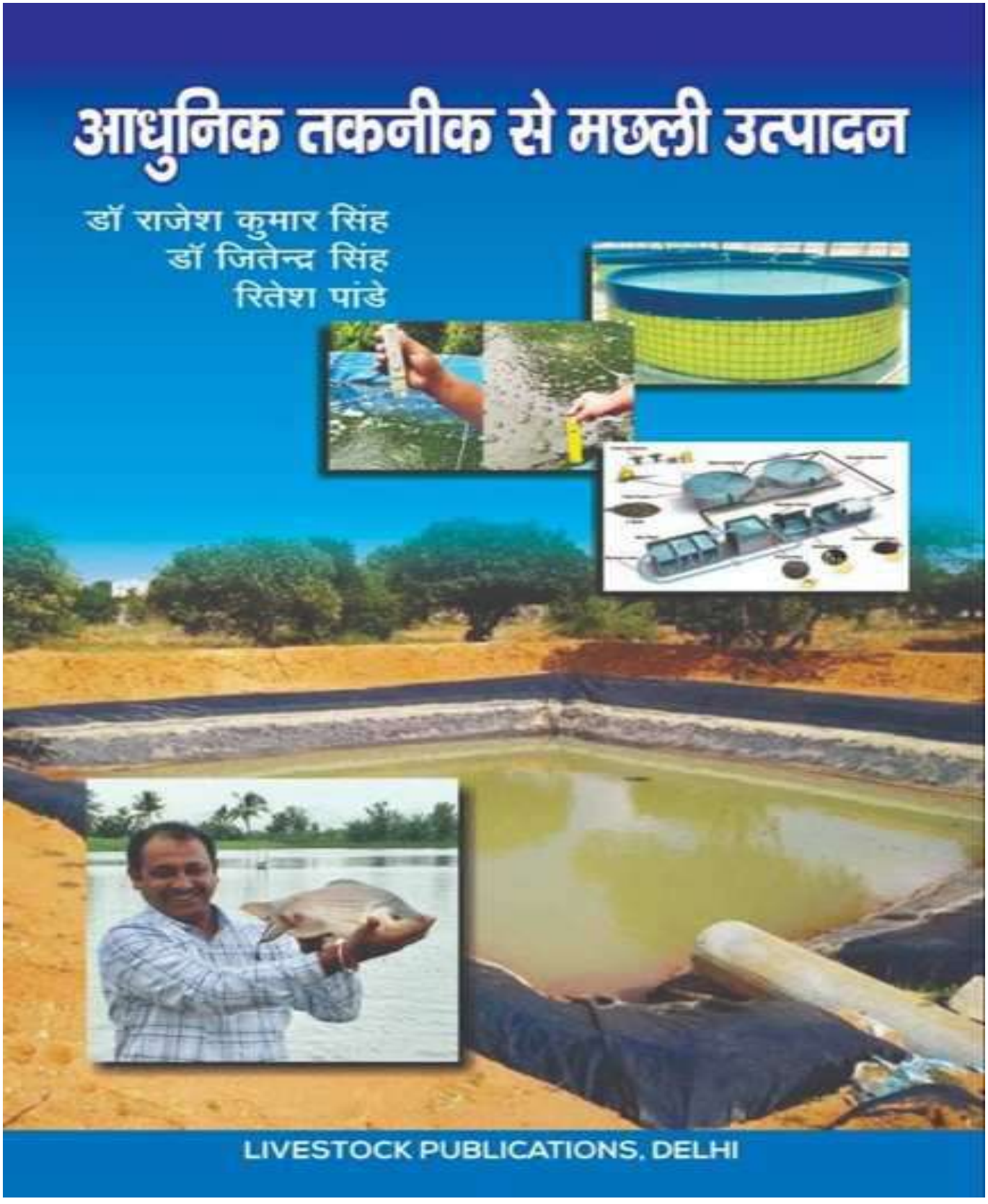
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