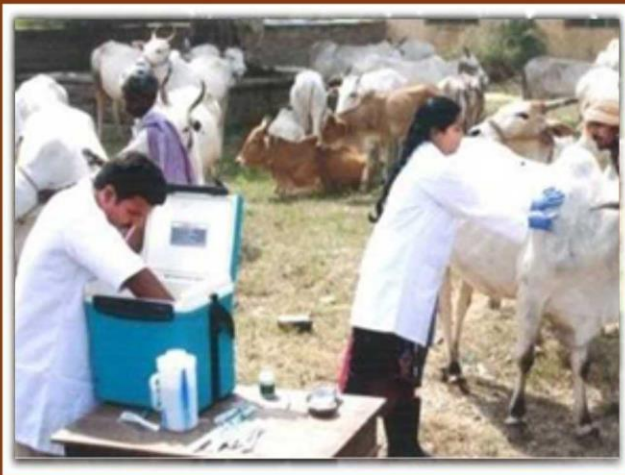


SINDH AGRICULTURAL GROWTH PROJECT



Training Facilitator Guide on Animal Health Management

E. Kang'the, S.A. Khan, M.N.M. Ibrahim and J. Githinji

(Sindhi & Urdu versions of this manual was Translated by: Deepesh Bhuptani, Barkat Ali, Ubaid Qureshi and Shahzad Iqbal)

June 2020

better lives through livestock

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ISBN: 978-969-7564-10-1

Citation: E. Kang'the, S.A. Khan, M.N.M. Ibrahim and J.Githinji, 2020. Training Facilitator guide on Animal Health Management. Published by ILRI under the Sindh Agricultural Growth Project - Livestock Component (SAGP-L) assisted by World Bank pp.79.

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PREFACE AND ACKNOWLEDGEMENTS

It is well known that dairy production is influenced to a large extent by the efficiency of feeding practices, animal health management, reproduction, and breeding management. All these practices have a direct impact on productivity, health status, and herd improvement in dairy animals. As such proper dairy management practices are key to sustain productivity and hence the profitability. Under the Sindh Agricultural Growth Project (livestock component) these aspects of dairy cattle and buffalo management were identified as constraints for enhancing milk production. Also, the lack of knowledge of all stakeholders involved in the dairy value chain (DVC) on modern dairy management practices further hindered the productivity of dairy animals.

In order to rectify these gaps in knowledge, the International Livestock Research Institute (ILRI) was recruited under a consultancy agreement in July 2017 with the mandate to capacity build all stakeholders involved in the DVC. ILRI with its knowledge in executing other livestock projects in Pakistan, designed capacity building and training interventions for various stakeholders at Provincial, District, Field level staff, and dairy farmer producer groups. Training materials were prepared by the ILRI team from ILRI publications listed at the end of this manual and finalized after several rounds of discussions with Sindh Livestock Department staff, SAGP-L staff, and Plan International - Pakistan staff. Using these training materials (English/Sindhi/Urdu), over the past 3 years ILRI conducted more than 12000 training programs/activities on various aspects of dairy production to provincial staff, district staff (VOs, Para-vets, LA), and to the 153 MPG members and non-members in the 11 project districts.

The final output of these training is the publication of three Facilitation training guides; namely **Feeds and Feeding, Animal Health Management, and Reproduction and Breeding**. These training manuals are prepared in English, Sindhi, and Urdu languages.

We are indebted to the Department of Livestock & Fisheries, Government of Sindh, and SAGP-L for their continued support provided during the planning and execution of workshops. We are grateful to participants of the workshops (DFMs, LLS, Deputy Directors of Districts, ILRI Pakistan staff, and Plan Int. staff) for their valuable inputs during discussions in finalizing the Training materials/manuals. We gratefully acknowledge the support provided by Phillip Sambati (Instructional Designer/ILRI Nairobi) for initiating the preparation of the Facilitator Manual template, and Dr. Okeyo Mwai (Senior Scientist, ILRI Nairobi) for conducting the Animal Reproduction and Breeding training, and to ILRI Pakistan Training Associates (Drs. Deepesh, Barkat, Ubaid, and Shahzad) for assisting in preparing the training materials and also with the translations of these manuals into Sindhi and Urdu.

Finally, The World Bank funding through the SAGP-L project for publishing these manuals is gratefully acknowledged.

Prof. Dr. M.N.M. Ibrahim

ILRI Scientist & DG Representative for ILRI in Pakistan

Islamabad, Pakistan

ABBREVIATIONS

ILRI	International Livestock Research Institute
SAGP-L	Sindh Agricultural Growth Project-Livestock Component
GoS	Government of Sindh
DVC	Dairy Value Chain
DFM	District Field Manager
LLS	Lady Livestock Supervisor
VO	Veterinary Officer
SA	Stock Assistant
LA	Livesock Assistant
BW	Body weight
IM	Intramuscular
IV	Intravenous
SC	Subcutaneous
Inj	Injection
IU	<i>International Unit</i>
FMD	<i>Foot and Mouth Disease</i>
FMDV	<i>Foot and Mouth Disease Vaccine</i>
HS	<i>Hemorrhagic Septicaemia</i>
HSV	<i>Hemorrhagic Septicaemia Vaccine</i>
BQ	<i>Black Quarter</i>
BQV	<i>Black Quarter Vaccine</i>

TABLE OF CONTENTS

PREFACE AND ACKNOWLEDGEMENTS	I
ABBREVIATIONS	II
CHAPTER ONE	2
COURSE INTRODUCTION	2
CURRICULUM	3
CHAPTER TWO	5
ANIMAL HEALTH AND BIOSECURITY	5
SESSION 1. Animal Health Management	6
SESSION 2. Biosecurity	8
SESSION 3. Introduction to Disease Prevention & Control.....	10
SESSION 4. Foot & Mouth Disease (FMD)	11
SESSION 5. Hemorrhagic Septicemia.....	13
SESSION 6. Brucellosis	15
SESSION 8. Mastitis.....	19
SESSION 9. Fascioliasis	21
SESSION 10. Lungworm (Parasitic Bronchitis)	24
SESSION 11. Anaplasmosis	26
SESSION 12. Babesiosis	28
SESSION 13. Theileriosis	30
SESSION 14. Zoo-Sanitary Measures	32
TRAINING MATERIALS	34
Annex 1: Trainer PowerPoint presentation - VOs and District Staff	35
Annex 2: Handout for VOs and District Staff on Economically important Diseases	46
Annex 3: Hand out for MPG farmer Training	56
List of ILRI PublicationS in Pakistan	75

CHAPTER ONE

COURSE INTRODUCTION



CURRICULUM

This course focuses on Animal Health Management of Cattle and Buffalo cows.

Delivery of this course will take one day with all factors held constant. This includes practical exercises.

The curriculum summary

The following is a summary of sessions and the duration each session will take.

Session	Time taken
Animal health management	01h00
Biosecurity	00h30
Introduction to disease prevention and control	00h30
Foot and Mouth Disease	00h45
Haemorrhagic Septicemia	00h45
Brucellosis	01h00
Black Leg/ Black Quarter	00h30
Mastitis	00h30
Fascioliasis	00h30
Lungworm (Parasitic Bronchitis)	00h30
Anaplasmosis	00h30
Babesiosis	00h30
Theileriosis	00h20
Zoo-Sanitary Measures	01h00

SESSION 1. Introduction to SAGP-L Training



1h00

Session Objectives	<p>Introduce the training to the participants including contextualizing the project:</p> <ul style="list-style-type: none">• To ensure that participants are clear how their work embeds with the overall objectives of the program• To ensure workshop objectives are clear• To identify needs and concerns of participants through sharing expectations• To introduce participants to each other• To establish trust and respect through agreeing on ground rules
Session Topics	<ul style="list-style-type: none">• Introductions• Project brief• Training objectives• Setting ground rules
Resources required	<ul style="list-style-type: none">• Flip chart to write ground rules• Sticky notes for participants to suggest ground rules

ACTIVITY I: Introductions and establishing training ground rules

THE NAME GAME & GROUND RULES

- What is your name
- Which one animal do you admire and why
- On a sticky note, suggest two ground rules you'd like all participants to follow in this workshop

ACTIVITY II: Introduce the conversation and scenario approach of this training

OFFICER ISMAIL AND FARMER DAWUD

- Dawud is a small holder dairy farmer who wants to improve his animal's nutrition and health
- Ismail is a government vet who will advise



Dawood has been a small holder dairy farmer for years and is interested in improving his production and profits from his small farm



Ismail has a government veterinary officer, he has worked with the community for a long time and understands the difference good animal management can make.

Explain to participants that the training approach will often be in the form of a conversation between a farmer and his extension officer.

CHAPTER TWO

ANIMAL HEALTH AND BIOSECURITY



SESSION 1. Animal Health Management



1h00

Session Objectives	By the end of the workshop, the participants will be able to explain what is animal health management and why is it important for the farmer
Resources required	Printed out and labeled image of a healthy cow Sticky notes for learners to write down answers

ACTIVITY I: ANIMAL HEALTH MANAGEMENT

ANIMAL HEALTH MANAGEMENT

Why is animal health management important?

Why should the farmer care about animal health management?



What is animal health management and how does it affect or help me as farmer?



The farmer has asked a very good question, animal health management minimizes negative effects of animal diseases on the farmer is categorized into the following:

- Appropriate husbandry
- Good hygiene
- Proper feed and
- Good management

6 out of every 10 human infectious diseases are likely shared with animals

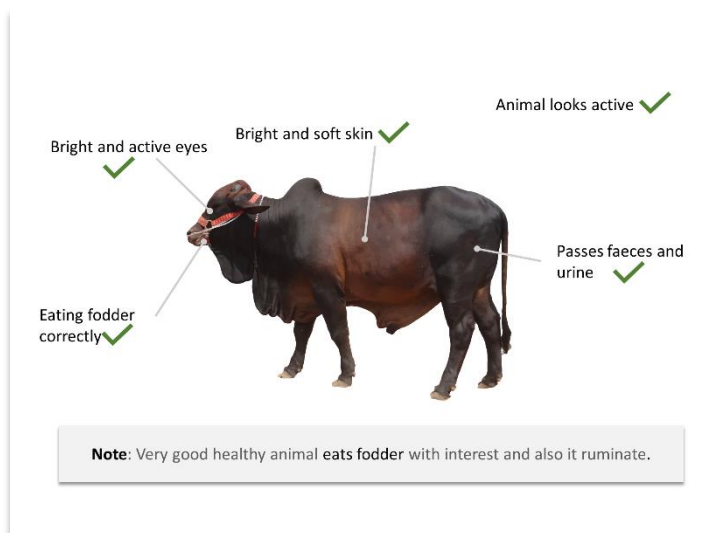


Discussion: *In the plenary, ask participants to give the characteristics of a healthy cattle*

Minutes: 10 minutes

KEY MESSAGES

- Animal Looks active.
- Bright and soft skin
- Bright and active eyes
- Eating fodder correctly
- Passes faeces and urine
- Eats fodder with interest and also it ruminates.



SESSION 2. Biosecurity



1h00

Session Objectives	By the end of the session, the participants will be able to explain the most important biosecurity measures for a small holder farmer to understand and implement
Resources required	Printed out images of biosecurity measures as indicated in the session below

ACTIVITY I: BIOSECURITY

➤ **Note: Use Annex 1 (ppt presentation) for VOs and District Staff**

BIOSECURITY IN CATTLE

What is biosecurity measures in cattle?

Why is biosecurity measures important to the farmer?



Information:

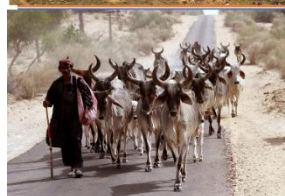
When animals are in contact with other animals there is often no way to know if they carry disease, this is why it is important to take precautions.

Biosecurity is the steps taken to prevent infectious diseases affecting animals and the people who care for them, examples include:

- Quarantine unsold animal from the market for 15 days
- Quarantine newly arrival animals for 15 days
- Do not mix animals with nomadic flock /herd without disease verification
- Do not send animals for grazing without disease verification with other flocks/herds



Do not send animals for grazing without disease verification with other flock/herd.



Isolate animals from nomadic flock /herd without disease verification



Buy and Sell



Quarantine newly arrival animals for 15 days.

15 days



Quarantine unsold animal from market for 15 days

15 days



Animal Health Management Training: SAGP-Livestock-ILRI/Shahid Ali Khan



Animal Health Management Training: SAGP-Livestock-ILRI/Shahid Ali Khan

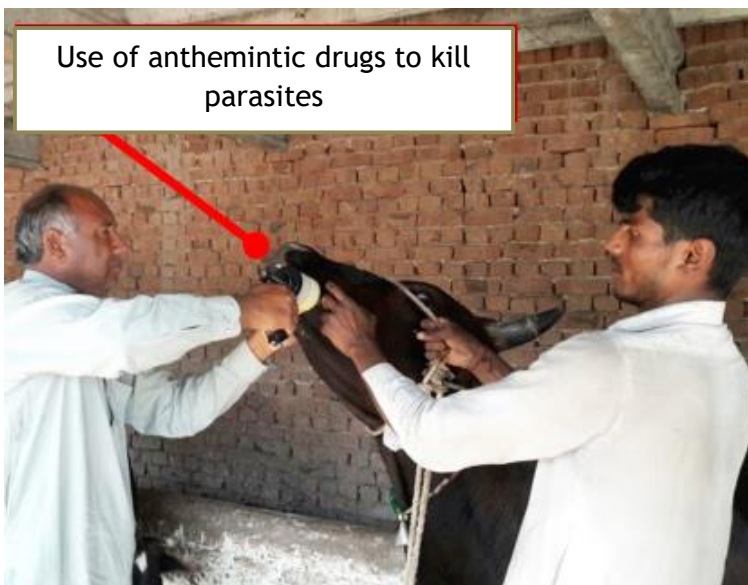
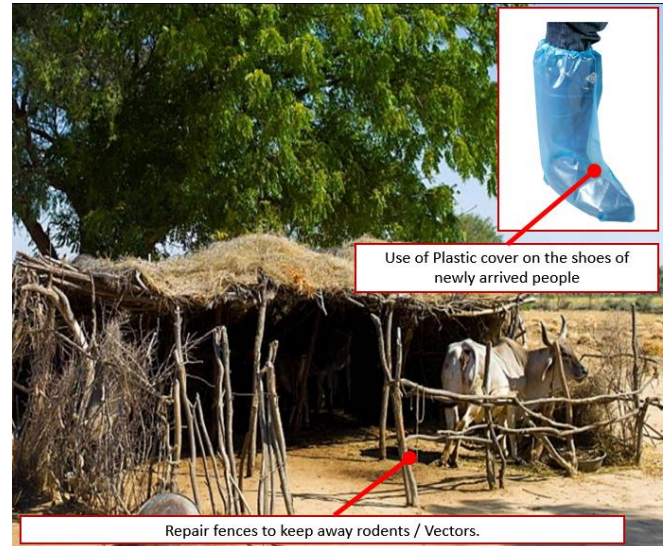


Discussion: In a plenary *discuss biosecurity measures that can be applied by a small holder farmer in Pakistan*

Minutes: 15 minutes

KEY MESSAGES

- Cleaning of instruments and floor with water spray
- Hygiene and Sanitation
- Repair fences to keep away rodents / Vectors
- Use of Plastic cover on the shoes of newly arrived people
- Use of anthelmintic drugs to kill parasites
- Use of Insecticide spray on the farm regularly



SESSION 3. Introduction to Disease Prevention & Control

➤ **Note:** For SESSIONS 3 to 14, Use Annex 1 (ppt presentation) for VO's and District Staff training and provide Annex 2 as a Handout



0h30

Session Objectives	By the end of the session, the participants will be able to explain to a farmer why disease prevention and control is in their best interest
Resources required	Animal health cards for learners to reference during the lesson

ACTIVITY I: BIOSECURITY

BIOSECURITY IN CATTLE

What is the farmers 'role in disease prevention?

What is your role as an officer in disease prevention?



Information:

Prophylactic Measures

- What is Vaccine?
- Types of Vaccine
- Storage of Vaccine
- Transportation vaccine
- Preparation of vaccine
- Inoculation of vaccine



Discussion: Provide the participants with an animal health card and take them through the contents.

Minutes: 30 minutes

ANIMAL HEALTH CARD FRONT & BACK

ANIMAL HEALTH CARD INSIDE

SESSION 4. Foot & Mouth Disease (FMD)



0h45

Session Objectives	By the end of the workshop, the participants will be able to explain to a farmer what FMD disease is, how to identify it and measure the farmer can take to prevent, control and or treat the disease
Resources required	Handout print outs or display of FMD disease in cattle

Prevention

Symptoms

Treatment

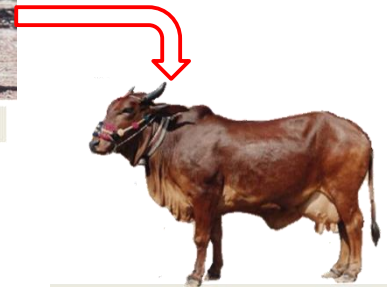
Foot and mouth disease (FMD) is the most highly contagious viral disease of cloven-footed animals (cattle, buffalo, sheep, and goats). The causative agent of FMD is **Aphthovirus**.

Transmission

- Animals become infected through
- Direct/ or indirect contact
- Inhalation
- Contaminated materials (fodder, drinking water, semen, faeces, urine, equipment, clothes, and skin of animal handlers, vehicles, etc.



Sheds 400 million virus particles per day



Only take 10-12 particles to infect one cow

Prevention

Symptoms

Treatment

Clinical Signs

- Fever
- Drop in milk production
- Weight Loss
- Loss of Appetite
- Quivering lips and frothing of the mouth
- Cows may develop blisters on the teats.
- Lameness



Prevention

Symptoms

Treatment

- There is no specific treatment for FMD but supportive care may be allowed.
- Antipyretics or Antibiotics are sheet anchors of the FMD treatments.
- Use boro glycerine for a lesion in the mouth.
- Copper sulphate (2-5%) washing feet and then dress it with fly repellent wound dressing. Phenolphthalein + oil can also be used.
- 15 ml of Lugol iodine in divided doses can be given daily.
- Vitamin AD3E (15 - 20ml per day for 3 days) can speed up the recovery.
- Administer 500ml oil, 0.5kg yogurt, and 3 grams of zinc sulphate daily for 5 days.
- Ring vaccination should be performed to restrict FMD to other villages/herds/areas

Field use of FMD Vaccine

- FMD vaccine is temperature-sensitive, so cold conditions (4-8°C) during storage and transport are important (from source to hospital, hospital to the field, and vaccine vials being used in the field).
- For first-timers (calves and adults), always ensure booster vaccination after 3 to 4 weeks of primary dose.
- Calves can be vaccinated at 3 to 4 months of age.
- Never freeze the FMD vaccine.
- For each herd use a separate needle.

SESSION 5. Hemorrhagic Septicemia



1h00

Session Objectives	By the end of the workshop, the participants will be able to explain to a farmer what Hemorrhagic Septicemia disease is, how to identify it and measures the farmer can take to prevent, control and or treat the disease
Resources required	Print out images of Hemorrhagic Septicemia disease in cattle

Prevention

Symptoms

Treatment

Hemorrhagic Septicaemia is an acute, fatal, and a bacterial disease of Buffaloes and cattle caused by *Pasteurella multocida*.

Transmission:

- Nasal secretions: Organisms are also not consistently present in sick animals.
- Principally a disease of animals under stress (poor food supply, close herding, and wet conditions contribute to the spread of the disease)
- Direct contact with infected animals and on fomites
- Ingestion or Inhalation

Prevention

Symptoms

Treatment

- High fever 104-106 °F
- Depression, restlessness and reluctance to move
- Congested mucous membranes
- Respiratory distress
- Salivation and nasal discharge
- Painful, mucopurulent, subcutaneous swelling in the pharyngeal region that extends to the ventral neck and brisket (and sometimes the forelegs)
- Calves may have a hemorrhagic gastroenteritis
- Death can occur within 6-24 hours after the first sign develops and, buffaloes are generally more susceptible to HS than cattle.





Prevention

Symptoms

Treatment

- Treatment is useful against H.S if administered very early disease period because of the majority cases with death occurring from 6-24 hours.
- Animal with fever must be treated with IV antimicrobials as soon as possible to quickly obtain systemic bactericidal antimicrobial concentrations.
 - a) Specific Treatment:
 - Inj: Excenel RTU @ 1mg/kg by IM or SC, once every 24 hours for a period of 3 consecutive days.
 - Inj: Enrofloxacin Sulphonamide @150 mg/kg BW IV daily for 3 days.
 - Inj: Oxytetracycline @5-10 mg/kg BW IV or IM daily for 3 days.
 - Inj: Sulphonamide @ 150 mg/kg BW IV daily for 3 days
 - b) Supportive Therapy:
 - Inj: Predef 2X @ 10-20mg (5-10mi) IM, Repeat after 12-24 hours if required
 - Inj: loxin @1ml/ 45kg IM. (Anti-pyretic)
 - Inj: Meloxicam Plus @ (Anti-pyretic)

Vaccination protocols

Inactivated vaccines: Vaccination is routinely practiced in endemic areas. The following three preparations are used:

1. Dense bacterins combined with either alum adjuvant or oil adjuvant.
2. Formalin-inactivated bacterins; the oil adjuvant bacterin is thought to protect for up to one year.
3. Alum bacterin for 4-6 months.

Please note that maternal antibody interferes with vaccine efficacy in calves.

SESSION 6. Brucellosis



1h00

Session Objectives	By the end of the workshop, the participants will be able to explain to a farmer what brucellosis disease is, how to identify it and measures the farmer can take to prevent, control and or treat the disease
Resources required	Printed out images of Brucellosis disease in cattle

Prevention

Symptoms

Treatment

Brucellosis is a highly contagious bacterial disease and bangs disease, causing late term-abortion and infertility in cattle. The causative agent of this disease is *Brucella abortus*. The disease is also a serious zoonosis, causing undulant fever in humans.

Transmission

- Ingestion of contaminated feed or water
- Licking an infected placenta, foetus or genitalia of another cow, after it has aborted
- Infected bulls excrete the organism in their semen
- Congenital transmission may occur through in utero infection



Prevention

Symptoms

Treatment

Clinical Signs:

- Abortion
- Weak calf born
- Retention of fetal membrane
- Swollen and infected testicles in bulls
- Sign of Infection in membranes
- Stillbirth that is that within 24 hours after calving



Prevention

Symptoms

Treatment



Prevention

Symptoms

Treatment

Treatment:

There is no treatment of Brucellosis in animals. It can be controlled by vaccination and the entire herd testing with the slaughter of reactors. Quarantine should be imposed by Government authorities until the herd is proven free of disease.

Zoo-sanitary measures against Brucellosis

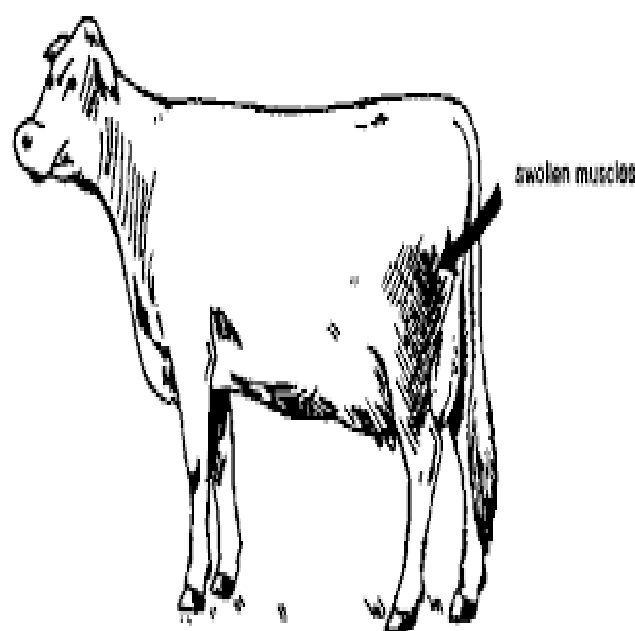
1. Hygienic measures considered during calving.
2. Clear and disinfect the contaminated premises.
3. Hygienic disposal of the uterine discharges, fetus, fetal membrane.
4. Eradication by the test-and-slaughter method.
5. Human brucellosis is best prevented by controlling the infection in animals.
6. Pasteurization of milk from infected animals was an important way to reduce infection in humans.
7. A combination of vaccination, surveillance, and abattoir traceback also undertaken to eradicate brucellosis.

SESSION 7. Black Leg/ Black Quarter



1h00

Session Objectives	By the end of the workshop, the participants will be able to explain to a farmer what Black Leg/ Black Quarter disease is, how to identify it and measures the farmer can take to prevent, control and or treat the disease
Resources required	Printed out images of Blackleg disease in cattle



Prevention

Symptoms

Treatment

Blackleg is a generally fatal bacterial disease of young cattle or sheep of any age manifested by severe inflammation of the muscle and mortality is very high in this disease. It is caused by *Clostridium chauvoei* (spore-forming, rod-shaped, and gas-producing bacteria).

Transmission

- Ingestion of contaminated feed and water
- Contamination of wounds

Prevention

Symptoms

Treatment

- Lameness High fever 104-105 °F
- Contamination of wounds
- Rapid breathing
- Discoloured, dry, or cracked skin.
- Swelling is small, hot and, painful
- Stiff gait and, reluctance to move
- Crepitating swelling often on the hips and, shoulder.

- Head lesions associated with edema and nose bleeding
- The animal usually dies in 12-48 hours,

Prevention

Symptoms

Treatment



Treatment is generally unsuccessful.

Specific antitoxin and antibiotics are rarely effective in the treatment of this disease.

- Inj: Procaine Penicillin G @ 22,000 IU/kg IM/SC 24 hrs for 3-5 days
- Inj: Oxytetracycline sprays 5% at the side of the wound.

Zoo-sanitary measures:

1. Diseased cattle should be isolated.
2. Don't allow animals for grazing in the affected area.
3. Burn any contaminated materials, including faeces.
4. Proper disinfection of surgical instruments before the operation.
5. Disinfect any contaminated areas
6. Do not conduct a necropsy or any biopsy on the animal.

Vaccination: Vaccination is a better way for the prevention of the disease.

For previously unvaccinated cattle and sheep, the primary course consists of 2 doses ideally given 4-6 weeks apart in cattle and 4 weeks apart in sheep. This should be followed by a booster dose of 3-4 weeks.

What are the correct dose rates?

- Alum precipitated B.Q. Vaccine 5 ml subcutaneous each year before the rainy season.
- Do not save unused parts of bottles or containers of vaccines for future use, as they can become contaminated with undesirable organisms and/or lose their potency. Destroy any vaccine not used within 24 hours of opening.

SESSION 8. Mastitis



1h00

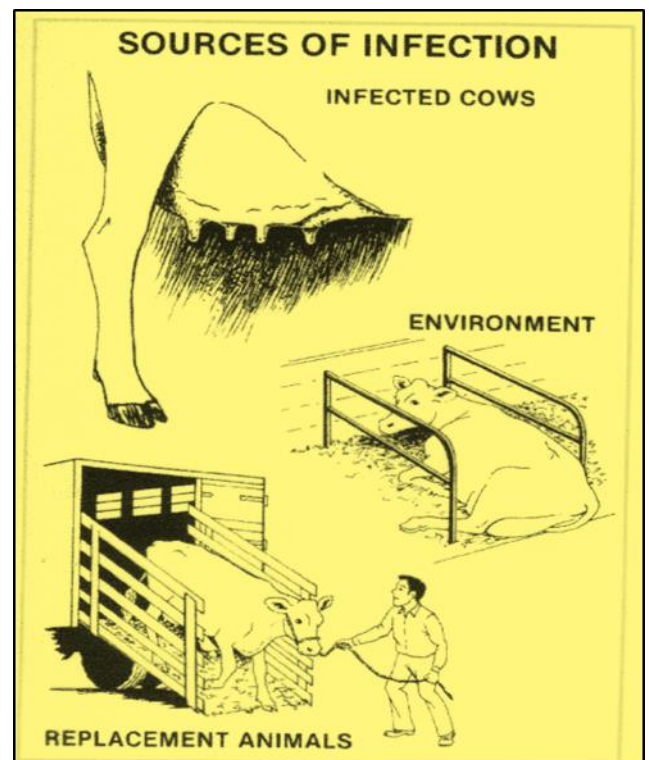
Session Objectives	By the end of the workshop, the participants will be able to explain to a farmer what Mastitis disease is, how to identify it and measures the farmer can take to prevent, control and or treat the disease
Resources required	Printed out images of Mastitis disease in cattle

Prevention	Symptoms	Treatment
------------	----------	-----------

Mastitis is Primarily a management problem that causes inflammation of one or more quarters of the udder. (Mamma = breast and itis = Latin suffix for inflammation). Causative agents are Bacteria (~70%) most common *Staphylococcus aureus* & *Streptococcus*. Yeasts and molds (~2%) and Unknown (physical, trauma and weather extremes; ~ 28%)

Transmission

- Damaged teat skin (colonize damaged skin and teat lesions).
- Environment (uninfected quarters by teat cup liners, milkers' hands, washcloths, bedding, soil, water, and manure)
- Replacement animals
- Wrong milking procedures. (Injury with inverted thumbs).
- Very dirty and unhygienic milking places, sheds, etc. The animals consistently sit in dirty places.



Prevention	Symptoms	Treatment
------------	----------	-----------

- The udder such as swelling, heat, hardness, redness, or pain; and
- The milk such as a watery appearance, flakes, clots, or pus.



Prevention

Symptoms

Treatment

Mastitis can be treated by:

- ❖ In clinical mastitis strip quarter, every 2 hours
- ❖ Both heat (15-30 minutes to loosen blockage) and cold (15-30 minutes to bring swelling down) application can be applied for the mastitis treatment.
- ❖ Infusion of an antibiotic preparation into the teat canal partially (3-4mm) introduction can give much better treatment results is the normal treatment. (Before infusion, clean, dry and disinfect the teat).
- ❖ In acute cases, systemic treatment (antibiotics) may be necessary.

Note: Penicillin is the traditional antibiotic used, but *Staphylococcus* bacteria especially are resistant.

It can be prevented and controlled by important general hygiene measures:

- Have a good milking system (prepare cows properly for milking)
- Optimize hygiene, starting directly after birth and insect control.
- Reduce bacteria in the environment (clean housing and bedding).
- Remove 'sucklers' from groups of young stock.
- Quarantine replacement heifers.

Reduce or eliminate associated risk factors:

- Reduce stress on the animals.
- Optimize nutrition, ventilation, and housing.

SESSION 9. Fascioliasis



1h00

Session Objectives	By the end of the workshop the participants will be able to explain to a farmer what Fascioliasis disease is, how to identify it and measures the farmer can take to prevent, control and or treat the disease
Resources required	Printed out images of Fascioliasis

Prevention

Symptoms

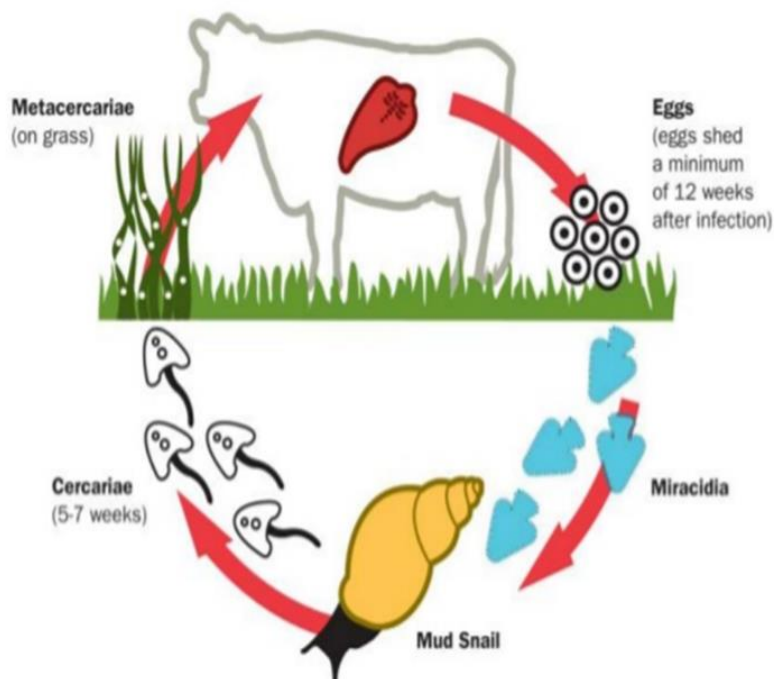
Treatment

Fascioliasis belongs to a group of foodborne trematode infections. Causative agent: Two species of trematodes that cause fascioliasis: *Fasciola hepatica* (ruminant) and *F. gigantica* are leaf-shaped worms, large enough to be visible to the naked eye.



Transmission

- By drinking larvae-infected water.
- Through snails and flies
- Ingestion of larvae-contaminated pastures with faeces
- Rural areas are more likely to become infected after failure to observe basic hygiene measures.
- Very dirty and unhygienic milking places, sheds, etc. The animals consistently sit in dirty places.



Prevention

Symptoms

Treatment

- Fever: usually the first symptom of the disease; 40-42 °C (104-107 °F)
- Abdominal pain.
- Gastrointestinal disturbances: loss of appetite, flatulence, nausea, diarrhea.
- Urticaria.
- Respiratory symptoms (very rare): cough, dyspnoea, chest pain, hemoptysis.
- Hepatomegaly and splenomegaly



Prevention

Symptoms

Treatment

- Fluke treatment and the age of fluke from which they are effective:

Active	Age of fluke killed
Triclabendazole	All stages
Albendazole	From 12 weeks
Closantal	From 8 weeks
Closantal plus Oxfendazole	From 6 weeks
Closantal plus Albendazole	From 8 weeks
Oxyclozanide plus levamisol	From 12 weeks

- Recovery of the infected animal is slow and must be feed nutritious feed to restore body condition and production.

Preventive Measures

- No vaccine is available to protect people against *Fasciola* infection.
- Prevention through pasture rotation is effective against fluke to protect from snail-infested pasture.
- Information, education, and communication, promoting the cultivation of vegetables/grasses in water free from faecal pollution.

- Environmental measures such as containment of the snail intermediate hosts and drainage of grazing lands.
- Vegetables grown in fields that might have been irrigated with polluted water should be thoroughly cooked before consumption.
- Visceral organs from potentially infected animals should be thoroughly cooked before consumption.

SESSION 10. Lungworm (Parasitic Bronchitis)



1h00

Session Objectives	By the end of the workshop, the participants will be able to explain to a farmer what Lungworm (Parasitic Bronchitis) disease is, how to identify it and measures the farmer can take to prevent, control and or treat the disease
Resources required	Printed out images of Lungworm disease in cattle

Prevention

Symptoms

Treatment

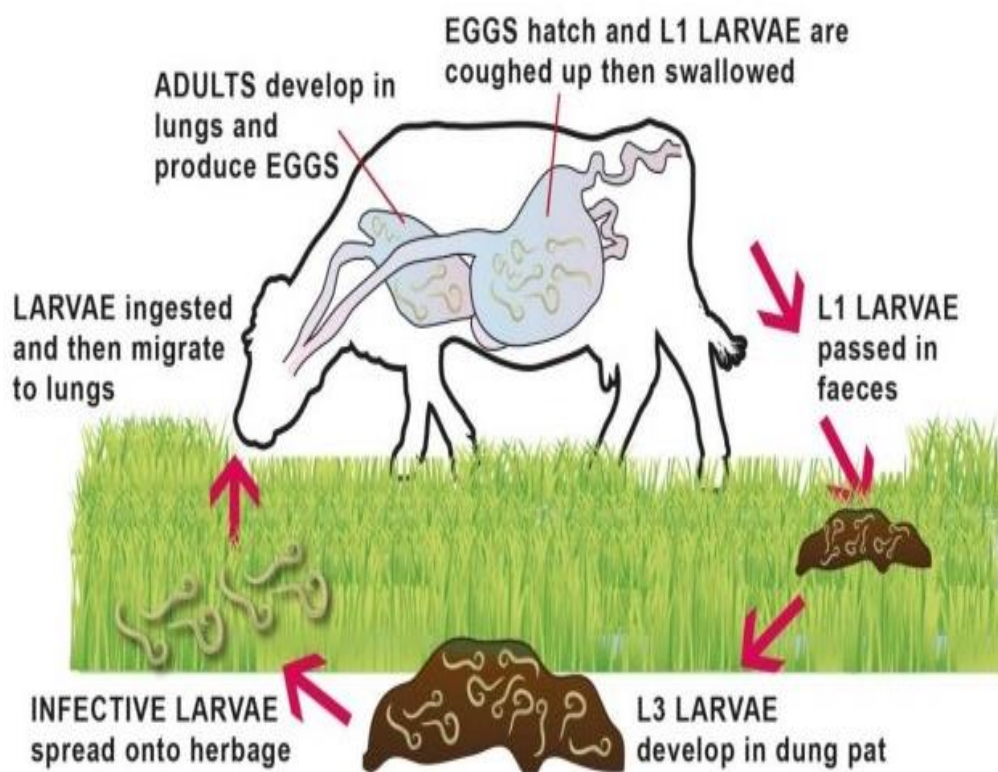
Parasitic bronchitis (husk) is an economically important parasite infection of the bovine respiratory tract. This disease is caused by the nematode, *Dictyocaulus viviparus* (Adult worms are slender and thread-like).

Transmission

- Ingestion of larvae-contaminated pastures with faeces.
- By drinking larvae-infected water (Larvae are resistant to the cold).
- People living in rural areas are typically more likely to become infected after failure to observe basic hygiene measures



LUNGWORM LIFE CYCLE



Prevention

Symptoms

Treatment

- Severe persistent coughing and respiratory distress and even failure
- Moderate coughing with slightly increased respiratory rates to



Prevention

Symptoms

Treatment

- Anthelmintic are highly effective against developing fourth-stage larvae and adult *D. viviparous*.
- An anti-inflammatory drug of corticosteroids may be given for a brief period (3 to 10 days) in severe cases.
- Prednisone is usually given (5-10 days) for tissue inflammation.

Good husbandry practices to manage internal parasites.

This include:

1. Clean grazing strategies.
2. A variety of combinations of pasture rotations.
3. Flexible stocking rates (Avoid overstocking).
4. Prophylactic anthelmintic regimens.
5. Treat with an effective anthelmintic drug.

SESSION 11. Anaplasmosis



1h00

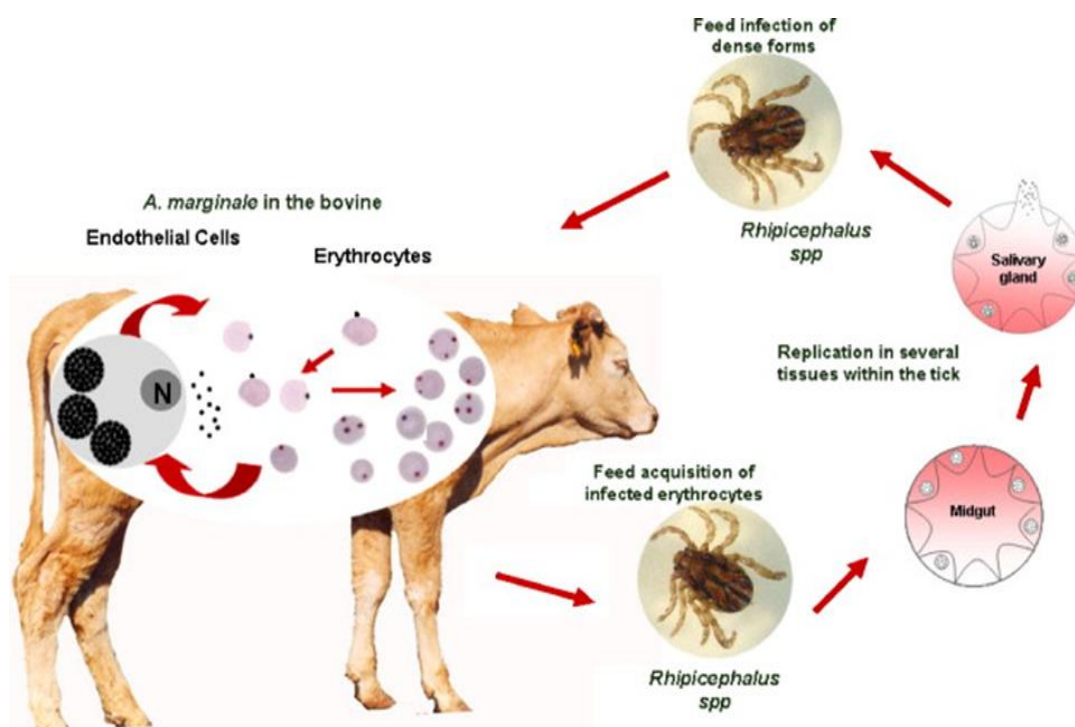
Session Objectives	By the end of the workshop, the participants will be able to explain to a farmer what Anaplasmosis disease is, how to identify it and measures the farmer can take to prevent, control and or treat the disease
Resources required	Printed out images of Anaplasmosis disease in cattle

Prevention	Symptoms	Treatment
------------	----------	-----------

Anaplasmosis is a blood-borne infectious and transmissible protozoan disease also called rickettsial disease. It is in the form of 'tick fever' in cattle. Caused usually by the *Anaplasma marginale*.

Transmission

- Mosquitoes, lice, and the horsefly are mechanical transmitters.
- Contaminated needles or dehorning or other surgical instruments.
- By drinking larvae-infected water and feed



Prevention

- Anaemia
- Fever
- Weight loss
- Breathlessness
- Jaundice
- Uncoordinated movements
- Abortion
- Death

Symptoms



Treatment



About

Symptoms

Treatment

- Inj: Oxytetracycline @ 20mg/kg Body weight I.M for 3-5 days.
- Inj: Imidocarb propionate @ 2.5mg/100kg Body weight I.M for 3-5 days
- Prednisolone, Vitamin B-complex & mineral mixture parentally as supportive therapy.

SESSION 12. Babesiosis



1h00

Session Objectives	By the end of the workshop, the participants will be able to explain to a farmer what Babesiosis disease is, how to identify it and measures the farmer can take to prevent, control and or treat the disease
Resources required	Printed out images of Babesiosis disease in cattle

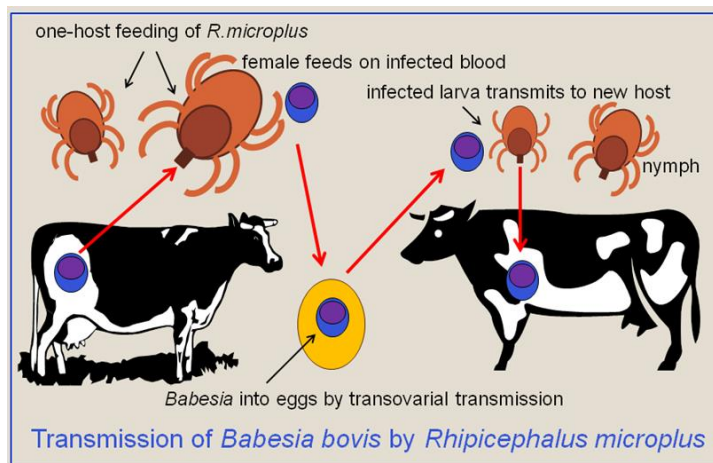
Prevention	Symptoms	Treatment
------------	----------	-----------

The disease is also called Texas fever, red water, piroplasmosis, or tick fever is a major tick-borne protozoan parasite disease of cattle. *Babesia .bovis* and *Babesia .bigemina* causes disease in cattle and buffalo (Mostly in buffalo).



Transmission

- Disease is transmitted by biting of ticks
- By drinking contaminated water and feed.
- Transfer of parasitaemic blood via veterinary equipment and biting flies.



Prevention	Symptoms	Treatment
------------	----------	-----------

- Acute babesiosis (Redwater)
- fever which persists through the acute phase, and is accompanied later by
- Anorexia
- Increased respiratory rate (particularly if animals are moved),
- Muscle tremors

- Anaemia
- Pipe-stem diarrhoea and
- Weight loss



About	Symptoms	Treatment
-------	----------	-----------

- Inj: Diamnazine @ 3-5mg/kg IM.
- Inj: Imidocarb dipropionate @ 1-3mg sub-cutaneously.
- To avoid allergic reaction steroid is injected 5-10 minutes after imidocarb.
- Vitamin B-complex @ 50ml and phenylbutazone (an anti-inflammatory drug) are administered parentally as supportive therapy.
- Cold therapy to lower the temperature (at high-temperature drugs don't work)

Preventive measures

- Effective control of tick, mosquitoes, and flies.
- Biological control by keeping pet birds to pick the ticks.
- The access of biting insects to contaminated fresh blood should be prevented.
- Avoid the use of contaminated instruments.

SESSION 13. Theileriosis



1h00

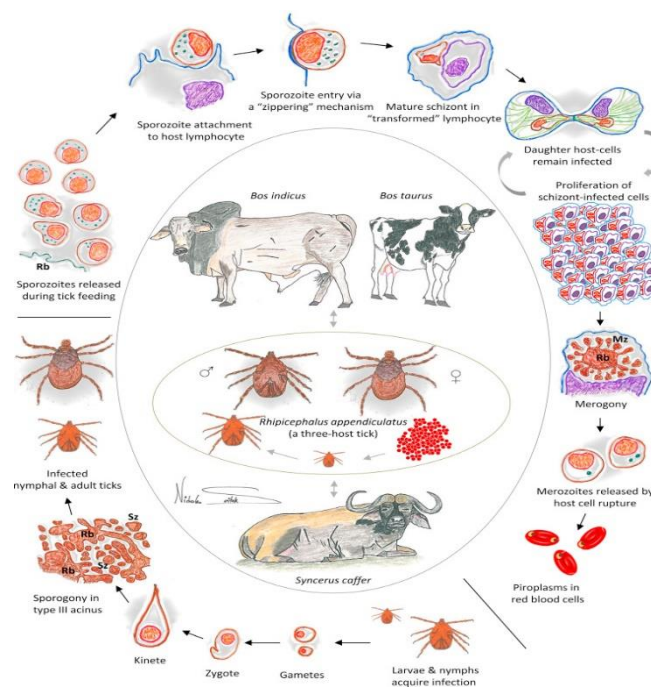
Session Objectives	By the end of the workshop, the participants will be able to explain to a farmer what Theileriosis disease is, how to identify it and measures the farmer can take to prevent, control and or treat the disease
Resources required	Printed out images of Theileriosis disease in cattle

Prevention	Symptoms	Treatment
------------	----------	-----------

It is a protozoan disease of young exotic and crossbred cattle in indo-Pak and not a contagious disease. Caused by species of *Theileria* spp belongs to the family: Theileriidae. 1. *Theileria parva*. 2. *Theileria annulata* and 3. *Theileria mutans*.

Transmission

- *Theileria parva* is transmitted by *Rhipicephalus appendiculatus*
- *Theileria annulata* transmitted by *Hyalomma* family Ticks



Prevention	Symptoms	Treatment
------------	----------	-----------

- A high temperature (41.2°C) is a common feature in acute cases.
- Diarrhoea with blood clots in a calf.
- Lymph node enlargement in six-months-old calves in an asymptomatic infestation.
- *Theileria-annulata*-piroplasms-cattle.



About

Symptoms

Treatment

Treatment is possible using naphthoquinones but is expensive. Other treatments are:

- Inj: Buparvaquone (Butalex) @ 1 ml / 20kg IM. Repeat after 2 days
- Inj: Oxytetracycline @ 10-20 mg / kg IM for 4-6 days

To avoid allergic reaction steroid is injected 5-10 minutes after imidocarb

In supportive therapy. Dextrose 5% given in severe jaundice

Prophylactic treatment if a tick is present (1ml at age of 7 days and repeat after 1 month)

Preventive measures

- Control of ticks
- Access of biting insects to contaminated fresh blood should be prevented
- Avoid the use of contaminated instruments

SESSION 14. Zoo-Sanitary Measures



1h00

Session Objectives	By the end of the workshop, the participants will be able to explain to a farmer the most important zoo-sanitary measures that a farmer can employ in the farm to prevent disease
Resources required	Printed out images of Zoo-Sanitary Measures for the farmer in the farm

- Keep healthy animals sheltered separately. ①
- Separate water and feeding for sick and healthy ②
- Separate suckling calves away from sick dams ③
- Discourage hospital visits from contagious animals ④
- Dead animal buried properly and death disinfected ⑤
- Visitor can spread diseases if not disinfected ⑥
- sick animal slaughtered than site must be disinfected ⑦
- Awareness programme for farmers on disease spread ⑧

ZOO-SANITARY MEASURE

1



Sick animals sheltered separately

healthy animals within farm or on another farm/shed.

ZOO-SANITARY MEASURE

2



Separate water and feeding mangers for sick and healthy animals. Burn left over feed and fodder.

ZOO-SANITARY MEASURE

3



Suckling calves should be separated from sick dams.

ZOO-SANITARY MEASURE

4



Hospital visit of contagious disease animals should be discouraged.

ZOO-SANITARY MEASURE

5

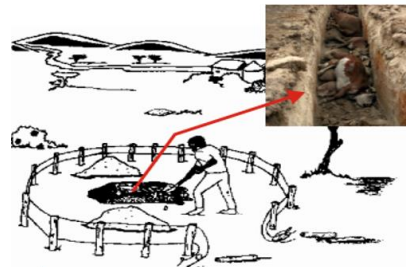


If sick animal slaughtered than site must be disinfected and blood/offals could be buried .

ZOO-SANITARY MEASURE

6

Dead animal should be buried properly and death area sprayed with disinfectant/limestone.



ZOO-SANITARY MEASURE

7



Veterinarian / Veterinary Assistants / Visitor can become the main source of spreading disease from one farm to another if not disinfected with clothes, body and shoes are not disinfected between visits.

ZOO-SANITARY MEASURE

8

Awareness programme for farmers to aware about the possible disease spread causes.



TRAINING MATERIALS

Annex 1: Trainer PowerPoint presentation - VOs and District Staff


ILRI CGAR

Sindh Agricultural Growth Project

Animal Health Management

Session 1: Animal Health and Biosecurity

Session 2: Contagious & Infectious Diseases and Economically Important Animal Diseases



1

Animal Health Management

SESSION 1

Animal Health and Biosecurity

ILRI CGAR

2


ANIMAL HEALTH MANAGEMENT

WHAT IS ANIMAL HEALTH MANAGEMENT?

The aim of managing animal health is to minimize negative effects of animal diseases on its, Production and welfare, Trade in livestock and livestock products and Human health.

STRATEGIES FOR ANIMAL HEALTH MANAGEMENT

- Appropriate husbandry
- Good hygiene
- Proper feed and
- Good management



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3

Signs Of Good Healthy Animal

1. Animal Looks active.
2. Bright an soft skin
3. Bright and active eyes
4. Eating fodder correctly
5. Passes faeces and urir



Note: Very good healthy animal eats fodder with interest and also it ruminate.

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4

بائيو سيڪيورٽي (BIOSECURITY) اسان جي هٿن ۾ آهي



The steps taken to prevent from infectious diseases affecting animals and the people who care for them.

ILRI CGAR

5

Bio-security Measures.....



Quarantine unsold animal from market for 15 days.

Quarantine newly arrival animals for 15 days.

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6

Bio-security Measures.....



Isolate animals from nomadic flock /herd without disease verification



Do not send animals for grazing without disease verification with other flock/herd.



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7

Bio-security Measures.....



Cleaning of instruments and floor with water spray



Hygiene and Sanitation.



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8

Bio-security Measures.....



Repair fences to keep away rodents / Vectors.



Use of Plastic cover on the shoes of newly arrived people



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9

Bio-security Measures.....



Use of anti-helmenthic drugs to kill protozoan



Use of Insecticide spray on farm regularly



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10

Your Role Prevention of the Disease

Prophylactic Measures

What is Vaccine?

Types of Vaccines:

Storage of Vaccine:

Transportation vaccine

Preparation of vaccine

Inoculation of vaccine



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11

ANIMAL HEALTH CARD FRONT & BACK

بچاء علاج کان بهتر آهي

ILRI
CGIAR

better lives through livestock

جانورن جو هيلٿ ڪارڊ

نمبر شمار: _____
 ايم پي جي جو نالو: _____
 مالوئڊ جو نالو: _____

جانورن جو قسم: _____
 ڊگيون - مينهن - ٽڪريون - ڏئون
 جانورن جي تعداد: _____
 گذريل ٽن سالن دوران مري ويل جانورن جو تعداد: _____
 ڊگيون - مينهن - ٽڪريون - ڏئون
 ايڊريس: _____
 موبائيل نمبر: _____

World Bank Assisted

وڃڻ واري بيمارين کان بچاءَ جي لاءِ ٽنهن هٿن جو طريقو

جانور	بیماری جو نالو	پهرين ٽيڪو	ٻيو ٽيڪو	ٽيون ٽيڪو
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جانورن جي لاءِ بين الاقوامي تحقيقي ادارو

ايم پي جي، 126، ڊاڪٽر هائوسنگ سوسائٽي فيز-1، حيدرآباد
 موبائيل: 022-2108411-2، اي ميل: m.ibrhim@cgiar.org




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12

ANIMAL HEALTH CARD INSIDE

15

FOOT AND MOUTH DISEASE (FMD)



<https://www.tasmanianregions.tas.gov.au/wp-content/uploads/2014/04/nepal-27.jpg>

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ILRI
International Livestock Research Institute

CGIAR
Consultative Group for International Agricultural Research

15

Animal Health Management

SESSION 2


Contagious & Infectious Diseases and Economically Important Animal Diseases

The bottom left corner of the slide features two logos. On the left is the ILRI logo, which includes the text 'ILRI' in a bold, serif font, with 'International Livestock Research Institute' written in smaller text below it. To the right of the ILRI logo is the CGIAR logo, which consists of a stylized green plant icon above the text 'CGIAR' in a bold, sans-serif font.

16

ETIOLOGY

- Foot and mouth disease (FMD) is most highly communicable viral disease of cloven-footed animals (cattle, buffalo, sheep and goats).
- **Causative Agent:** Aphthovirus a RNA virus which belongs to family: Picornaviridae.
- **Serotypes:** There are seven serotypes (**A, Asia1, O, C, SAT1, SAT2, SAT3**).
Sub serotypes: Over **100** serotypes. Vaccination against one serotype doesn't protect the animal against other serotypes.
- FMD serotypes and sub-serotypes prevailing in Pakistan, O-Pain Asia II, A-Turkey 06 & Asia I Sindh 08. (**Source: FAO Project GCP/PAK/123/USA**)
- **Morbidity Rate:** 80-100%
- **Mortality Rate :** Not usually fatal in Adults,
In young animal 20-30%.



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16

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FOOT AND MOUTH DISEASE (FMD) CONTINUE.....

Introduction and Etiology

- Foot and mouth disease (FMD) is most highly communicable viral disease of cloven-footed animals (cattle, buffalo, sheep and goats). Disease causative agent is **Apthovirus**.

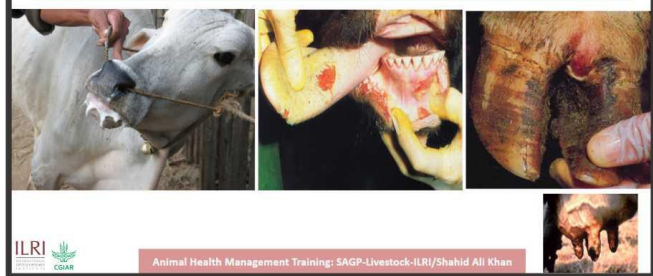
Clinical Sign



Introduction and Etiology

- Foot and mouth disease (FMD) is most highly communicable viral disease of cloven-footed animals (cattle, buffalo, sheep and goats). Disease causative agent is **Aphthovirus**.

Clinical Sign




17


Transmission


Animals become infected through:

- ✓ Direct/ or indirect contact.
- ✓ Inhalation.
- ✓ Animal products.
- ✓ Contaminated materials (fodder, drinking water, semen, faeces, urine, equipments, clothes and skin of animal handlers and vehicles etc).
- ✓ Artificial insemination or Natural




Sheds 400,000,000 virus particles per day






Only take 10-12 particles to infect one cow



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INTERNATIONAL
LIVESTOCK
RESEARCH
INSTITUTE



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FOOT AND MOUTH DISEASE (FMD) CONTINUE.....

Transmission

Animals become infected through:

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- ✓ Contaminated materials (fodder, drinking water, semen, faeces, urine, equipments, clothes and skin of animal handlers and vehicles etc).
- ✓ **Artificial insemination or Natural**



Sheds 400,000,000 virus particles per day



Sheds 400,000,000 virus particles per day

CLINICAL SIGN SUMMARY

Incubation Period :
2 – 10 Days

- Fever: 103-106°F.
- Dullness & Anorexia
- Salivate profusely and nasal Discharge
- Development of single or multiple vesicles (Blister) of 2mm to 10cm on: Tongue, hard palate, dental pad, lips, gums, muzzle, coronary band, inter digital cleft, and teats in lactating cows.
- Sudden drop in milk production.
- Feet vesicles can lead to chronic lameness.
- Abortion in pregnant animals
- More severe in exotic & cross breeds (Panting in summer) than indigenous breeds.
- In sheep and goats signs are mild.



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19

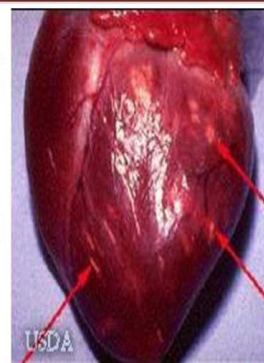
POST-MORTEM FINDINGS

In young animals:

Focal necrosis of cardiac muscle (Grey or yellow streaking on myocardium) "Tiger heart".

In adult animals:

Ulcerative lesions on tongue, palate, gums, pillars of the rumen and feet.



20

DIAGNOSIS

Samples of Choice in Case of FMD

1. Vesicular fluid (ideal but difficult to collect).
2. Epithelial tissue (excellent).
3. Ideally, about 1gm of epithelial tissue should be collected from an un-ruptured or recently ruptured vesicles.
4. Blood (only for sero diagnosis-NSP/SP serology).

Preservation of Samples

- A simple and suitable transport medium is buffer glycerol.
- Composition: (PBS; pH 7.2 with Glycerol in equal ratio V/V)

OIE Approved Laboratory Tests

1. Antigen detection: (ELISA, RT-PCR & Virus isolation)
2. Antibody detection: (ELISA & VNT)



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21

TREATMENT

- There is no specific treatment for FMD but supportive care may be allowed.
- Antipyretics or Antibiotics are sheet anchors of the FMD treatments.
- Use boroglycerine for lesion in mouth.
- Copper sulphate (2-5%) washing feet and then dress it with fly repellent wound dressing. Phenolphthalein + oil can also be used.
- 15 ml of lugol iodine in divided doses can be given daily.
- Vitamin AD₃E (15 - 20ml per day for 3 days) can speed up the recovery.
- Administer 500ml oil, 0.5kg yoghurt and 3 grams of zinc sulphate daily for 5 days.
- Ring vaccination should be performed to restrict FMD to other villages/herds/areas.



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22

FIELD USE OF FMD VACCINE

- FMD vaccine is temperature sensitive, so cold conditions (4-8°C) during storage and transport are important (from source to hospital, hospital to field, vaccine vials being used in field).
- For first timers (calves and adults), always ensure booster vaccination after 3 to 4 weeks of primary dose.
- Calves can be vaccinated at 3 to 4 months of age.
- Never freeze FMD vaccine.
- For each herd use a separate needle.



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23

HAEMORRHAGIC SEPTICEMIA (HS)

Hemorrhagic Septicaemia is an acute, fatal, and a bacterial disease of Buffaloes and cattle caused by *Pasteurella multocida*.



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24

CLINICAL SIGN SUMMARY

Incubation Period:
Varies from 3-5 Days

Most cases are acute or peracute. The following signs are seen:

- High fever 104 –106 °F (40 – 41.1°C)
- Depression & restlessness
- Congested mucous membranes
- Respiratory distress
- Salivation and nasal discharge
- Painful, mucopurulent, subcutaneous swelling in the pharyngeal region that extends to the ventral neck and brisket (and sometimes the forelegs).
- Calves may have a haemorrhagic gastro-enteritis
- Reluctance to move
- Death can occur within 8–24 hr after the first signs develop.
- Buffaloes are generally more susceptible to HS than cattle.



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25

CLINICAL SIGN



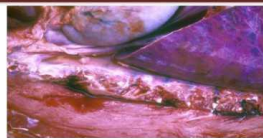
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26

POST-MORTEM FINDINGS



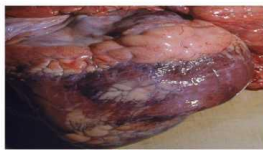
Bovine, head and neck.
Marked subcutaneous edema.



Blood-tinged fluid often accumulates in the body cavities



Bovine, submandibular region.
There is severe subcutaneous/fascial edema and multifocal hemorrhage. The parotid gland exhibits interlobular edema.



Bovine, heart.
There are numerous often coalescing petechiae on the epicardium.



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27

TRANSMISSION

Sources of the agent:

Blood: Septicaemia in HS occurs at the terminal stage of the disease, therefore, blood samples taken from sick animals before death may not always contain *P. multocida* organisms.

Nasal secretions: Organisms are also not consistently present in sick animals.

Animals become infected through:

- ✓ Principally a disease of animals under stress (poor food supply, close herding and wet conditions contribute to the spread of the disease).
- ✓ Direct contact with infected animals and on fomites.
- ✓ Ingestion or inhalation.
- ✓ In endemic areas, 5% of cattle and water buffalo may normally be carriers.
- ✓ Worst epidemics during rainy season, in animals in poor physical condition
- ✓ *P. multocida* can survive for hours and possibly days in damp soil or water; viable organisms are not found in the soil or pastures after 2–3 weeks.
- ✓ Biting arthropods do not seem to be significant vectors



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28

DIAGNOSIS

Samples of Choice in Case of HS

1. In freshly dead animals, a heparinized blood sample or swab should be collected from the heart (other visceral organs may also be sample) and a nasal swab within a few hours of death.
2. A long bone from animal that have been dead for a long time.
3. Blood can be taken from jugular vein and Spleen and bone marrow samples.
4. Tips of ears (from live animal only).

Preservation of Samples

- Blood samples should be placed in a standard transport medium and transported on ice packs.

OIE Approved Laboratory Tests

- Serotyping methods: Includes the Rapid slide agglutination test, Indirect haemagglutination test, Somatic antigen agglutination tests, Agar gel immunodiffusion and Counter immunoelectrophoresis.
- Isolation: From the blood or bone marrow (cultural and biological methods).
- Identification: Biochemical, Serological and Molecular methods.



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29

TREATMENT

- Treatment is useful against HS if administered very early disease period.
- Animal with fever must be treated with IV antimicrobials quickly to obtain systemic bactericidal antimicrobial concentrations.

a) Specific Treatment:

Inj: Excenel RTU @ 150mg/Kg by IM/SC, once every 24 hours for 3 consecutive days

Inj: Sulphonamide @150 mg/kg B.wt/IV daily for 3 days.

Inj: Oxytetracycline @5-10 mg/kg B.wt IV or IM daily for 3 days.

b) Supportive Therapy:

Inj: Predef 2X @ 10-20mg (-10ml) IM, Repeat after 12-24 hours if required

Inj: Iloxin @1ml/ 45kg IM. (Anti-pyretic)

Inj: Avil/ Cadistin @ 5 – 10 ml. I.M. (Anti-histamine)



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30

VACCINATION PROTOCOLS:

• Inactivated vaccines:

Vaccination is routinely practiced in endemic areas. Three preparations are used:

1. Dense bacterins combined with either alum adjuvant or oil adjuvant.
2. Formalin-inactivated bacterins; the oil adjuvant bacterin is thought to provide protection for up to one year.
3. Alum bacterin for 4–6 months.

• Maternal antibody interferes with vaccine efficacy in calves



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31

BRUCELLOSIS



https://www.researchgate.net/figure/280714925_fig1_Fig-1-Aborted-cow-fetus-due-to-brucellosis-with-edema-opaque-and-bleeding



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32

ETIOLOGY

- Brucellosis is a highly contagious bacterial disease and bangs disease, causing late term-abortion and infertility in cattle. The disease is also a serious zoonosis, causing undulant fever in humans.

Causative agent: Caused by genus: *Brucella* belongs to family: Brucellaceae which consist of 8 species according to antigenic variation & primary host.

Cattle by <i>Brucella.abortus</i>	Sheep & goats by <i>Brucella.melitensis</i> .
Sheep by <i>Brucella.ovis</i>	Wood rats by <i>Brucella. neotomae</i>
Dog by <i>Brucella.canis</i>	Marine mammals by <i>Brucella. cetacea</i> & <i>B. pinnipedialis</i>

- It is still an uncontrolled serious public health problem in many developing countries



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33

CLINICAL SIGNS



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34

CLINICAL SIGN SUMMARY

In Cattle:

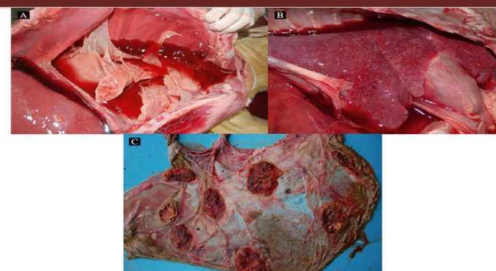
- **Abortion.** Usually occurs at about 5-7 months. Full-term calves may die soon after birth. Abortion rates in herds vary from 30% to 80%.
- **Retained placenta and secondary metritis** is common and may lead to permanent sterility.
- In bulls (orchitis, epididymitis, seminal vesiculitis and hygromas) in chronically affected herds.
- Localization of bacteria in the joints causing arthritis. particularly of the carpal joints, occur in some animals in chronically affected herds.



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POSTMORTEM FINDINGS



- Intense fibrin deposition on the pleural and pericardial surfaces, and purulent fluid in thoracic cavity.
- White spots in the lung parenchyma measuring between 0.1 mm and 0.5 mm in diameter, and purulent fluid in thoracic cavity.
- Placenta exhibiting red areas in intercotyledonary regions & well-defined yellowish-white round areas on the cotyledonary surface.



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TRANSMISSION



1. Ingestion of contaminated feed or water.
2. Spread by dogs, rats, flies, boots, vehicles, the milking machine and other equipment used in the barn.
3. Licking an infected placenta, foetus or genitalia of another cow, after it has aborted.
4. Infected bulls may excrete the organism in their semen.
5. Congenital transmission may occur through in utero infection.
6. Humans are infected through handling infected cows or their tissues (humans through cuts in the skin, or through mucous membranes).
7. Through consumption of unpasteurized milk.



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DIAGNOSIS

Sample of choice for Brucellosis:

Live animals :

- Milk samples, semen and arthritis or hygroma fluids.
Blood samples (for serum) from a number of cows in the herd, together with a pooled milk sample

At post-mortem:

- Samples of lymph nodes, spleen, mammary gland and uterine tissues from cows

Laboratorial Tests:

- Serology Tests: Serum agglutination test (SAT), complement fixation test (CFT), ELISA (CELISA), 2-mercaptoethanol test (2ME), Agar gel immunodiffusion test (AGID) and Fluorescence polarization assay (FPA) etc.
- Molecular Tests: PCR, Southern blot and Pulse-field gel electrophoresis.



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TREATMENT

Etiotropic Therapy:

Tetracycline 1.2 – 2.0 ml/day and Chlorthenphenicol 2.0 – 3.0 ml/day
(Combination of both these drugs for the period of average 2 weeks)



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ZOO-SANITARY MEASURES

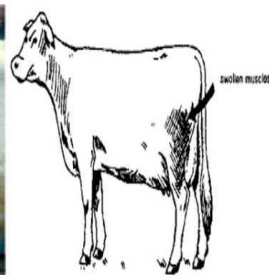
1. Hygienic measures considered during calving .
2. Clear and disinfect the contaminated premises.
3. Hygienic disposal of the uterine discharges, fetus, fetal membrane.
4. Eradication by test-and-slaughter method.
5. Human brucellosis is best prevented by controlling the infection in animals.
6. Pasteurization of milk from infected animals was an important way to reduce infection in humans.
7. Combination of vaccination, surveillance and abattoir trace back also undertaken to eradicate brucellosis.



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BLACK LEG/ BLACK QUARTER



<http://www.fao.org/docrep/003/x1703e/PPR5.jpg>



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41

ETIOLOGY:

- Blackleg is a generally fatal bacterial disease of young cattle or sheep of any age manifested by severe inflammation of the muscle.
- Found in cattle as young as 2 months old, most losses occur in cattle between 6 months and 2 years of age. Disease is sporadic in nature.
- Causative Agent: It is caused by *Clostridium chauvoei* (spore forming, rod shaped, gas producing bacteria) belongs to family: Clostridiaceae.
- Mortality is high.



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CLINICAL SIGNS:



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CLINICAL SIGNS SUMMARY

- High fever (41°C)
- Lameness
- Loss of appetite
- Rapid breathing
- Discoloured, dry or cracked skin.
- Swelling is small, hot and painful.
- Stiff gait and reluctance to move
- Crepitating swellings often on the hips and shoulder.
- Head lesions associated with edema and nose bleeding
- In sheep gaseous crepitation cannot be felt before death
- Animal usually die in 12 to 48 hours.



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44

POSTMORTEM FINDINGS



Upper left leg extensive areas of dark red muscle tissue and subcutaneous emphysema followed by massive myonecrosis of right hind leg

<http://www.rockandherd.net.au/cattle/reader/blackleg-calves.html>

Dark-red skeletal muscle of a heifer showing haemorrhage, necrosis, edema and emphysema



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45

TRANSMISSION

Animals become infected through

The disease is not transmitted directly from sick animals to healthy animals.

Disease spreads through:

- Ingestion of contaminated feed and
- Contamination of wounds.

In sheep wounding as a result of shearing, tail docking, castration, injury to ewes at lambing or infection of the navel soon after birth.



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46

DIAGNOSIS

Samples of Choice in Case of B.Q

- Tissues or fluid from the swelling should be taken as soon after death as possible.

Laboratorial Tests:

1. The fluorescent antibody test for *C chauvoei* is rapid and reliable.
2. PCR is available and very good for clinical samples.



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47

TREATMENT

Treatment is generally unsuccessful.

Specific antitoxin and antibiotics are rarely effective in the treatment of this disease.

Inj: Procaine Penicillin G @ 22,000 IU/kg IM/SC 24 hrs for 3-5 days.

Inj: Oxytetracycline spray 5% at the side of wound.



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48

ZOO-SANITARY MEASURES

General measures:

1. Diseased cattle should be isolated.
2. Don't allow grazing in affected area.
3. Burn any contaminated materials, including feces.
4. Proper disinfection of surgical instruments prior to operation.
5. Disinfect any contaminated areas
6. Do not conduct a necropsy or any biopsy on the animal.



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49

BQ VACCINES

Vaccination: Vaccination is a better way for the prevention of the disease.

For previously unvaccinated cattle and sheep, the primary course consists of 2 doses ideally given 4–6 weeks apart in cattle and 4 weeks apart in sheep. This should be followed by a booster dose 12 months later.

What are the correct dose rates?

- Alum precipitated B.Q. Vaccine 5 ml subcut each year before rainy season.
- Glanvac® 6 1mL for sheep
- Ultravac® 5in1 1mL for sheep/2mL for cattle
- Ultravac® 7in1 2.5ml for cattle
- Do not save unused parts of bottles or containers of vaccines for future use, as they can become contaminated with undesirable organisms and/or lose their potency. Destroy any vaccine not used within 24 hours of opening.



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MASTITIS



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ETIOLOGY

Mastitis is Primarily a management problem causes inflammation of one or more quarters of the udder. (Mamma = breast and itis = Latin suffix for inflammation).

Causative agent: Bacteria (~70%) most common *Staphylococcus aureus* & *Streptococcus*. Yeasts and molds (~2%) and Unknown (physical, trauma and weather extremes; ~28%)

- The most costly disease affecting dairy cattle throughout the world.
- **Intramammary infection:** 60% of all heifers, **First lactation:** 16% clinical mastitis & **After calving:** 30% occur within 14 days.

Animal health: Loss of functional quarter, lowered milk production

Human health: Poor quality milk and antibiotic residues in milk.



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CLINICAL SIGNS



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53

CLINICAL SUMMARY

There are two type of the Mastitis. 1. Sub-clinical & 2. Clinical Mastitis

Sub-clinical mastitis: Presence of an infection without apparent signs of local inflammation or systemic involvement.

- ~ 90 -95% of all mastitis cases, Udder and milk appears normal but lowered milk output (~ 10%)
- Elevated SCC (score 3-5) and for longer duration

Clinical mastitis:

- ~ 5 - 10% of all mastitis cases, inflamed red udder with pain, clumps and clots in milk. It is further Acute and Chronic type.

Acute type: Major type with bad milk (Purulent or bloody exudate from teats), Loss of appetite, depression and animal tends to lie down chronic type.

Chronic type: Cow appears healthy & Bad milk (watery pale fluid)



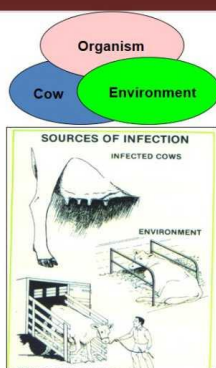
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54

TRANSMISSION:

Infection is transmitted by:

1. Damaged teat skin (colonize damaged skin and teat lesions).
2. Environment (uninfected quarters by teat cup liners, milkers' hands, washcloths, bedding, soil, water and manure)
3. Flies
4. 'Sucklers' (animals that suckle other animals) in a group of young stock.
5. Replacement animals
6. Wrong milking procedures. (Injury with inverted thumbs).
7. Very dirty and unhygienic milking places, sheds etc. The animals consistently sit in dirty places.



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55

DIAGNOSIS

Sample of choice for mastitis:

- Fresh, unrefrigerated milk can be tested for up to 12 hours and refrigerated milk can be tested for up to 36 hours.



Laboratorial Tests/ Methods:

- Visual method
- Direct method
- Indirect method
- CMT, SCC, Stir cup test, Surf filled mastitis test.
- Bromothymol Blue (BTB) test, Simplified Resazurin Rennet Test Modified Whiteside test, Wisconsin Mastitis test,
- Electrical Conductivity test and Culture method test.



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56

TREATMENT

Mastitis can be treated by:

- ❖ In clinical mastitis strip quarter every 2 hours

❖ Both heat (15-30 minutes to loosen blockage) and cold (15-30 minutes to bring swelling down) application can be applied for the mastitis treatment.

❖ Infusion of an antibiotic preparation into the teat canal partially (3-4mm) introduction can give much better treatment results than the normal treatment. (Before infusion, clean, dry and disinfect the teat).

❖ In acute cases, systemic treatment (antibiotics) may be necessary.

Note: Penicillin is the traditional antibiotic used, but *Staphylococcus* bacteria especially are resistant.



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57

ZOO-SANITARY MEASURES

- It can be prevented and controlled by important general hygiene measures:

- Have a good milking system (prepare cows properly for milking)
- Optimise hygiene, starting directly after birth and insect control.
- Reduce bacteria in environment (clean housing and bedding).
- Remove 'sucklers' from groups of young stock.
- Quarantine replacement heifers.

Reduce or eliminate associated risk factors:

- Reduce stress on the animals.
- Optimise nutrition, ventilation and housing.



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58

Annex 2: Handout for VOs and District Staff on Economically important Diseases

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Sindh Agricultural Growth Project

Animal Health Management
Economically Important Diseases

Shahid Ali Khan
SAGP-Livestock-ILRI

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ECONOMICALLY IMPORTANT DISEASES

1. FASCIOLIASIS
2. LUNGWORM (PARASITIC BRONCHITIS)
3. ANAPLASMOSIS
4. BABESIASIS
5. THILERIOSIS

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2

CONTENTS:

- 1 • ETIOLOGY
- 2 • CLINICAL SIGNS
- 3 • POST-MORTEM FINDINGS
- 4 • TRANSMISSION
- 5 • LIFE CYCLE OVERVIEW
- 6 • DIAGNOSIS
- 7 • TREATMENT
- 8 • PREVENTIVE MEASURES

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FASCIOLIASIS

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FASCIOLIASIS CONTINUE.....

ETIOLOGY

- Fascioliasis belongs to group of **food borne trematode** infections is a zoonotic common disease of liver flukes caused by two species of parasitic flatworms or trematodes that mainly affect the liver.
- **Causative agent:** Two species of trematodes that cause fascioliasis : ***Fasciola hepatica*** (ruminant) and ***F. gigantica*** are leaf-shaped worms, large enough to be visible to the naked eye.
- No continent is free from fascioliasis.

Fasciola hepatica is a parasitic fluke that lives in the liver. In addition to humans it infects cows and sheep. It is known as the common liver fluke and causes a disease called fascioliasis.

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FASCIOLIASIS CONTINUE.....

TRANSMISSION

- Fascioliasis is a global disease, and human cases have been reported from more than 75 countries worldwide.

1. Infection in the environment is usually perpetuated by animals.
2. Consuming larvae-contaminated uncooked vegetables.
3. By drinking larvae-infected water.
4. Rural areas are more likely to become infected after failure to observe basic hygiene measures.

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FASCIOLIASIS CONTINUE.....

CLINICAL SIGN



FASCIOLIASIS CONTINUE.....

Yellow staining of the conjunctiva

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FASCIOLIASIS CONTINUE.....

POST-MORTEM FINDINGS



Numerous flukes of *Fasciola hepatica* observed in the bile ducts and liver parenchyma of a cow.

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8

FASCIOLIASIS CONTINUE.....

DIAGNOSIS

Sample of Choice

- Diagnosis of fascioliasis may be suspected on the basis of the clinical picture. Confirmation relies on different types of diagnostic techniques.
- The most widely used diagnostic approach is direct detection of *Fasciola* eggs, by light-microscopic examination of faeces.

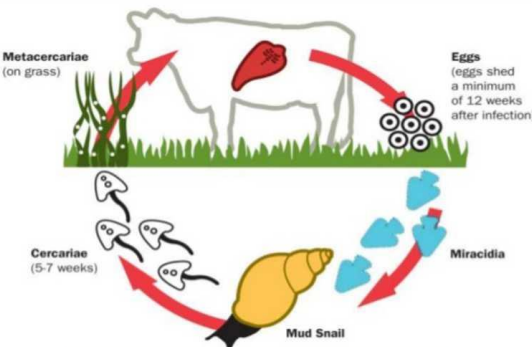
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9

FASCIOLIASIS CONTINUE.....

AN OVERVIEW OF LIFECYCLE



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FASCIOLIASIS CONTINUE.....

TREATMENT

- Fluke treatment and the age of fluke from which they are effective:

Active	Age of fluke killed
Triclabendazole	All stages
Albendazole	From 12 weeks
Closantal	From 8 weeks
Closantal plus Oxfendazole	From 6 weeks
Closantal plus Albendazole	From 8 weeks
Oxyclozanide plus levamisole	From 12 weeks

- Recovery of the infected animal is slow and must be feed nutritious feed to restore body condition and production.

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11

FASCIOLIASIS CONTINUE.....

PREVENTIVE MEASURE:

1. No vaccine is available to protect people against *Fasciola* infection.
2. Prevention through pasture rotation is effective against fluke to protect from snail-infested pasture.
3. Information, education and communication, promoting cultivation of vegetables/grasses in water free from faecal pollution.
4. Environmental measures such as containment of the snail intermediate hosts and drainage of grazing lands.
5. Vegetables grown in fields that might have been irrigated with polluted water should be thoroughly cooked before consumption.
6. Visceral organs from potentially infected animals should be thoroughly cooked before consumption.

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12

LUNGWORM (PARASITIC BRONCHITIS)



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13

LUNGWORM (PARASITIC BRONCHITIS) CONTINUE.....

ETIOLOGY

Parasitic bronchitis (husk) is an economically important parasite infection of the bovine respiratory tract. Mortality occurs in heavy infections.

Causative agent: This disease is caused by the nematode, *Dictyocaulus viviparus* (Adult worms are slender and thread-like) belongs to family: Dictyocaulidae.



Photo courtesy of Prof Mike Taylor

- Most commonly seen in first year grazing cattle in late summer and autumn.



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14

LUNGWORM (PARASITIC BRONCHITIS) CONTINUE.....

CLINICAL SIGN



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15

LUNGWORM (PARASITIC BRONCHITIS) CONTINUE.....

CLINICAL SIGN SUMMARY

- Elevated temperature (40 - 41 °C).
- Rapid shallow breathing which in later stages becomes laboured breathing.
- Coughing and nasal discharge.
- Weight loss.
- Cyanosis .
- Recumbency.



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16

LUNGWORM (PARASITIC BRONCHITIS) CONTINUE.....

POST-MORTEM FINDINGS

Enlarged lung lymph nodes



Lung edema and emphysema



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17

LUNGWORM (PARASITIC BRONCHITIS) CONTINUE.....

TRANSMISSION

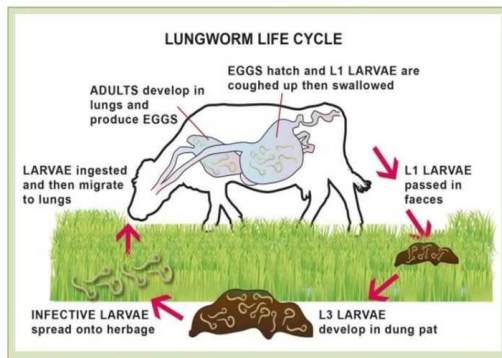
- Ingestion of larvae-contaminated pastures with faeces.
- By drinking larvae-infected water (Larvae are resistant to the cold).
- People living in rural areas are typically more likely to become infected after failure to observe basic hygiene measures.



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AN OVERVIEW OF LIFECYCLE



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19

DIAGNOSIS

Disease occurs in young calves. If an animal is suspected of lungworm infection, there are many ways to detect this parasitic infection such as performing one or more of the following techniques:

- Diagnosis is based on the clinical signs and grazing history.
- A complete medical history including lung auscultation (stethoscope examination).
- Fecal examination for detection of ova or larvae,
- Examination of respiratory secretions for ova or larvae.
- ELISA test can be used to detect antibodies to *D. viviparus*.



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20

TREATMENT

- Anthelmintic are highly effective against developing fourth-stage larvae and adult *D. viviparus*.
- An anti-inflammatory drug of corticosteroids may be given for a brief period (3 to 10 days) in severe cases.
- Prednisone is usually given (5–10 days) for tissue inflammation..



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21

PREVENTIVE MEASURE:

- Better husbandry practices to manage internal parasites.

This include:

1. Clean grazing strategies.
2. A variety of combinations of pasture rotations.
3. Flexible stocking rates (Avoid overstocking).
4. Prophylactic anthelmintic regimens.
5. Treat with an effective anthelmintic drugs.



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22

ANAPLASMOSIS



https://naturalunseenhazards.files.wordpress.com/2011/11/elk1_bwilliamsdwd.jpg?w=500



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23

ETIOLOGY

- Anaplasmosis is a blood borne infectious and transmissible protozoan disease also called rickettsial disease. It is in form of 'tick fever' in cattle.

Causative Agent: Caused usually by the *Anaplasma marginal* and sometimes by *Anaplasma centrale* obligate intracellular parasites belongs to family: Ehrlichiaaceae. *A phagocytophilum* has recently been reported to infect cattle.

- Bovine anaplasmosis is of economic significance in the cattle industry. Occurs in tropical and subtropical regions worldwide.
- In animals <1 yr old anaplasmosis is usually subclinical, in yearlings and 2-yr-olds it is moderately severe, and in older cattle it is severe and often fatal.



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24

CLINICAL SIGN



25

CLINICAL SIGN SUMMARY

1. High fever 106°F (41°C).
2. Anemia.
3. Weakness and respiratory distress after exercise.
4. Depression and anorexia.
5. Jaundice and frequently a marked loss of condition.
6. Frequent urination (Brown due presence of bile pigment) and constipation.
7. Decreased milk production.
8. Edematous swelling of the limbs
9. Abortion.
10. Severely affected animals may die.

26

POST-MORTEM FINDINGS



Lymph Nodes Appear Brown



Enlarged spleen (three times normal size)

27

TRANSMISSION

Biological Vector:

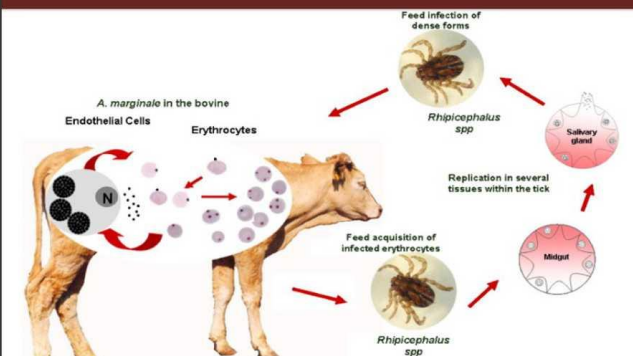
- Boophilus species of ticks (60%) transmit anaplasmosis.

Physical Vector:

- Mosquitoes, lice and the horsefly are mechanical transmitters.
- Contaminated needles or dehorning or other surgical instruments.

28

AN OVERVIEW OF LIFECYCLE



29

DIAGNOSIS

Samples of Choice

1. Blood from ear vein.

Laboratory Tests

- Microscopic examination of stained blood smears.
- Serological testing (Molecular amplification techniques of rickettsial DNA).
- PCR & ELISA

30

TREATMENT

- Inj: Ox tetracycline @ 20mg/kg Body weight I.M for 3-5 days.
- Inj: Imidocarb propionate @ 2.5mg/100kg B.w I.M for 3-5 days
- Prednisolone, Vitamin B-complex & mineral mixture paraentally as supportive therapy.



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31

BABESIASIS



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32

ETIOLOGY

The disease is also called Texas fever, red water, piroplasmosis, or tick fever is a major tick-borne protozoan parasites disease of cattle. Older animals are more acutely affected (clinical babesiosis is rare in cattle younger than six months).

Causative Agent: Caused by *Babesia* spp. belongs to family: Babesiidae.

- ✓ *Babesia .bovis* cause disease in cattle and buffalo.
- ✓ *Babesia .bigemina* cause disease in cattle and buffalo (Mostly in buffalo).

- The cattle tick, *Boophilus microplus*, is the vector for babesiosis.

- **Mortality** up to 50 % or over.



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CLINICAL SIGN



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CLINICAL SIGN SUMMARY

- High fever (41.5° C)
- Reddened and injected mucous membranes at the early stages and later, anaemic mucous membranes.
- Anorexia
- Depression
- Increased respiratory rate particularly following exertion
- Muscle tremor
- Reluctance to move.
- Hemoglobinuria (Dark reddish brown urine in the terminal stage)
- Sometimes signs of cerebral derangement (circling, head pressing, mania & convulsions).
- Mortality depending on age, breed etc....



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35

POST-MORTEM FINDINGS



Splenomegaly and jaundice

Red/coffee-colored urine in urinary bladder



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36

TRANSMISSION

Incubation period of disease is 7–10 days.

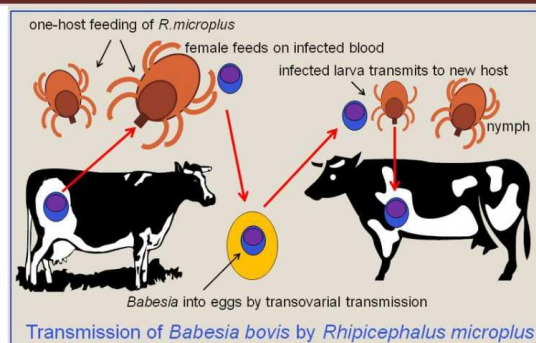
Babesia bovis is transmitted by larval stages of ticks (1% of total RBCs infected).

Babesia bigemina is transmitted by nymph stages of ticks (10% of total RBCs infected).

- Transfer of parasitaemic blood via veterinary equipment and biting flies.



AN OVERVIEW OF LIFECYCLE



DIAGNOSIS

Samples of Choice

1. Blood approximately 5 ml of blood sample from jugular.
2. Brain, liver, kidney and lungs biopsies also have been used in the diagnosis.

Laboratory Tests

- Microscopic examination of stained blood smears.
- Antibodies against *Babesia* sp. may appear in the blood of infected cattle within 1 to 3 weeks and are sought by complement fixation (CF) or indirect FA tests.
- PCR and ELISA

TREATMENT

- Inj: Diamnazine @ 3-5mg/kg IM.
- Inj: Imidocarb dipropionate @ 1-3mg sub-cutaneously.
- To avoid allergic reaction steroid is injected 5-10 minutes after imidocarb.
- Vitamin B-complex @ 50ml and phenylbutazone (anti-inflammatory drug) are administered parentally as supportive therapy.
- Cold therapy to lower the temperature (at high temperature drugs don't work)

PREVENTIVE MEASURE:

- Effective control of tick, mosquitoes and flies.
- Biological control by keeping pet birds to pick the ticks.
- The access of biting insects to contaminated fresh blood should be prevented.
- Avoid use of contaminated instruments.

THEILERIOSIS



<http://www.theileria.org/India/wp-content/uploads/2015/08/theileriosis.png>

CLINICAL SIGN

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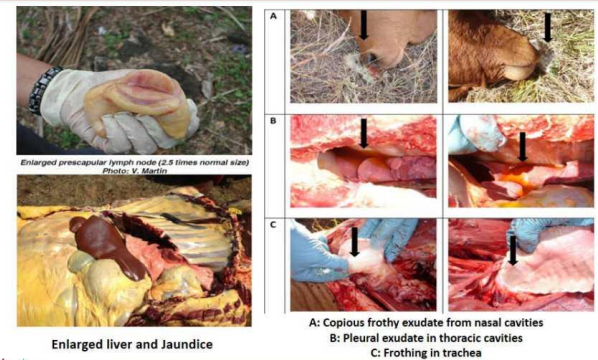
44

43



Incubation period :
1 to 3 weeks

- ## POST-MORTEM FINDINGS



Enlarged liver and Jaundice

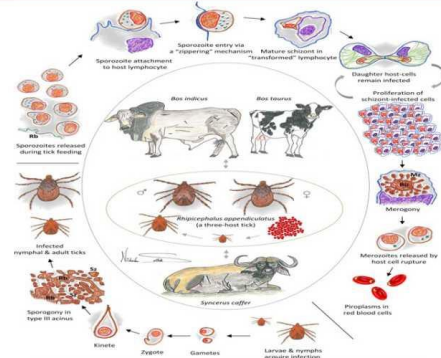
A: Copious frothy exudate from nasal cavities
B: Pleural exudate in thoracic cavities
C: Frothing in trachea

45

46

THILERIOSIS CONTINUE.....

- ## AN OVERVIEW OF LIFECYCLE



Animal Health Management Training: SAGP-Livestock-ILRI/Shahid Ali Khan

47

48

DIAGNOSIS

Samples of Choice

- Blood approximately 5 ml of blood sample from jugular vein conserved by EDTA.
- Biopsy material of lymph nodes or liver.

Laboratory Tests

- **Agent identification:** Microscopic examination of stained blood and PCR.
- **Detection of immune response:** Indirect fluorescent antibody test and ELISA.



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49

TREATMENT

- Treatment is possible using naphthoquinones but is expensive. Other treatments are:

Inj: Buparvaquone (Butalex) @ 1 ml / 20kg IM. Repeat after 2 days.

Inj: Oxytetracycline @ 10-20 mg / kg IM for 4-6 days.

- To avoid allergic reaction steroid is injected 5-10 minutes after imidocarb.
- In supportive therapy. Dextrose 5% given in severe jaundice.
- Prophylactic treatment if tick is present (1ml at age of 7 days and repeat after 1 month).



Animal Health Management Training: SAGP-Livestock-ILRI/Shahid Ali Khan

50

PREVENTIVE MEASURE:

- Control of ticks.
- Access of biting insects to contaminated fresh blood should be prevented.
- Avoid use of contaminated instruments.



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51

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52

Annex 3: Hand out for MPG farmer Training

Sindh Agriculture Growth Project

Animal Health & Management

Part 1: Animal Health & Biosecurity Measures

Part 2: Contagious & Infectious Diseases

Part 3: Economically Important Diseases



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Animal Health Management

The aim of managing animal health is to minimize the negative effects of animal diseases on its:

Production and welfare

Trade-in livestock and its products and Human health.



STRATEGIES FOR ANIMAL HEALTH AND GOOD MANAGEMENT:

- **Appropriate husbandry**
- **Good hygiene**
- **Proper feed and**
- **Good management**

SIGNS OF HEALTHY ANIMAL

1. Norm vital signs
2. Alertness
3. Shiny moist skin
4. Bright active eyes
5. Normal food intake
6. Normal feces and urine
7. Animals look free from all anxiety



Note: All healthy animals should eat eagerly when fed and ruminants should be seen chewing their cud.



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BIOSECURITY IS IN OUR HANDS .



The steps should be taken to prevent from infectious & contagious diseases that effecting animals & humans who care for them.



Quarantine unsold animals from the market for 15 days.



Quarantine newly arrival animals for 15 days.



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VACCINATION PROCEDURE



Properly vaccinate the animals with proper dose and in a proper way.



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ANIMAL HEALTH CARD

Prevention Is Better Than Cure



INTERNATIONAL
LIVESTOCK
RESEARCH
INSTITUTE



CGIAR





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ANIMAL HEALTH CARD

Serial no _____

Name of MPG _____

Farmer's Name _____

CNIC NO _____

Cell No _____

Address _____

Membership# _____

Types of Animals

Cow	Buffalo	Goat	Sheep
-----	---------	------	-------

Last three years No's of Death Animals

Cow	Buffalo	Goat	Sheep
-----	---------	------	-------



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جانور	بيماري جو نالو	پھريون ٽڪو	ٻيو ٽڪو	بيماري کان مستل بچاءَ لاءِ
ڳاڙهو ماھيو مال	ٽاٽ ايند ماڻهوءَ ملاڙ يا سا مالاڙ	ٽن مھينن کان پوءِ ڪڍڻن بد عمر ۾	ٽي کان چار ھفتن کان پوءِ	ٻن ٽڪن کان پوءِ ھر چھين مھيني کان پوءِ
	ماھيو روڪھ سڀنيھيا گھوڪھي يا گھنار	ٽن مھينن کان پوءِ ڪڍڻن بد عمر ۾	ٽي کان چار ھفتن کان پوءِ	ٻن ٽڪن کان پوءِ ھر چھين مھيني کان پوءِ
	اڀيسھ سھوار ٿي ڪٽري ٽنگ يا جيھي بيماري	ٽن مھينن کان پوءِ ڪڍڻن بد عمر ۾	ٽي کان چار ھفتن کان پوءِ	ٻن ٽڪن کان پوءِ ھر چھين مھيني کان پوءِ
	اڀير مھي ڪسي نڪان	ٽن مھينن کان پوءِ ڪڍڻن بد عمر ۾	ٽي کان چار ھفتن کان پوءِ	ٻن ٽڪن کان پوءِ ھر چھين مھيني کان پوءِ
	اڀير ٽوڪل ڪسيھيا رٿاوان دست	ٽن مھينن کان پوءِ ڪڍڻن بد عمر ۾	ٽي کان چار ھفتن کان پوءِ	ٻن ٽڪن کان پوءِ ھر چھين مھيني کان پوءِ
ريون ۽ پگريون	پھي ٻي آر / مڪاڻا ٻوسٽا پوچارو	ٽن مھينن کان پوءِ ڪڍڻن بد عمر ۾	ھڪ ٽڪو پوري زندگي جي لاءِ سڪائي آھي	
	شھيد (ڇوڪر يا ماھڻي) ماتا	ٻن کان ٽي مھينن کان پوءِ ڪڍڻن بد عمر ۾	ٽي کان چار ھفتن کان پوءِ	ٻن ٽڪن کان پوءِ ھر چھين مھيني کان پوءِ
	بلو وھوڻيا لفڙي	ٽن مھينن کان پوءِ ڪڍڻن بد عمر ۾	ٽي کان چار ھفتن کان پوءِ	ٻن ٽڪن کان پوءِ ھر چھين مھيني کان پوءِ
	اڀير مھي ڪسي نڪان	ٻن کان ٽي مھينن کان پوءِ ڪڍڻن بد عمر ۾	ٽي کان چار ھفتن کان پوءِ	ٻن ٽڪن کان پوءِ ھر چھين مھيني کان پوءِ

جانورن جي لاءِ بين الاقوامي تحقيقي ادارو

H#126, Defence Housing Society Phase-I, Hyderabad
 Email: m.ibrahim@cglar.org Phone No 022-2108431-2

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Foot & Mouth Disease

Introduction of Disease & Etiology:

Foot and mouth disease (FMD) is most highly communicable viral disease of cloven-footed animals (cattle, buffalo, sheep and goats).

Causative Agent: **Apthovirus**



Sign & Symptoms:



Transmission:

- ü **Direct/ or indirect contact.**
- ü **Inhalation.**
- ü **Animal products.**
- ü **Artificial insemination or Natural**
- ü **Contaminated materials (fodder, drinking water, semen, faeces, urine, equipments, clothes and skin of animal handlers and vehicles etc).**



HAEMORRHAGIC SEPTICEMIA (HS)

Introduction of Disease & Etiology:

Hemorrhagic Septicaemia is an acute, fatal, and a bacterial disease of Buffaloes and cattle caused by *Pasteurella multocida*.

Sign & Symptoms:



Transmission:

- 1 Breathing and air contact
- 2 Infects animal's through mucosal discharge



Brucellosis

Introduction of Disease & Etiology:

Other name of this disease is Abortion,
Contagious disease of the reproductive
system.

Caused by: *Brucella.abortus*

Sign & Symptoms:



Transmission:

1. Contaminated food & water.
2. The disease spread from affected cow & Bull during natural mating
3. Through air
4. Through affected animals secretion & excretion
5. Enter in the body through skin and wound.

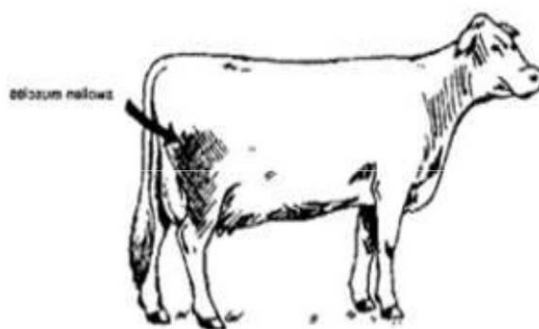


Black Quarter or Black Leg

Introduction of Disease & Etiology

Black quarter is the fatal disease in this occur in cow, buffalo, sheep & goats are affected.

Caused by: *Clostridium.chouvei*



Sign & Symptoms:



Transmission:

1. Contaminated feed.
2. Infected animal's wound



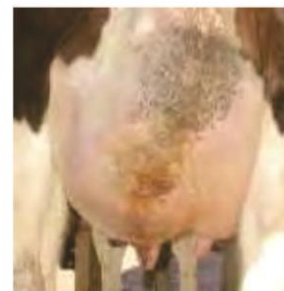
Mastitis

Introduction of Disease & Etiology:

Mastitis is commonly known as swelling of the udder. This disease known with different traditional names.

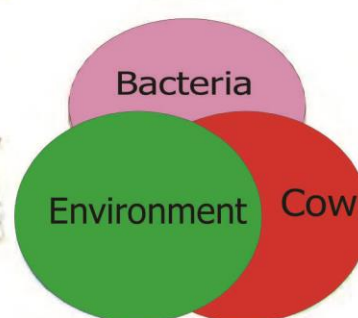
This disease is caused by different types of bacteria.

Sign & Symptoms:



Transmission:

1. Farm not properly cleaned.
2. Hands not properly washed before milking.
3. After milking udder's is not properly washed.
4. Different types of bacteria.
5. Transmission through teats.



FASCIOLIASIS

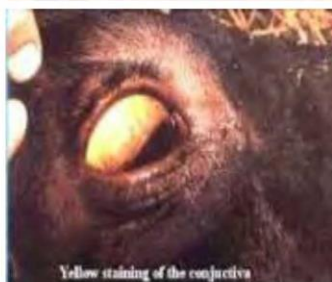
Introduction of Disease & Etiology:

It belongs to a group of foodborne trematode infections. It is a zoonotic common disease of liver flukes caused by two species of parasitic flatworms or trematodes that mainly affect the liver.

This disease caused by a specific type of *Fasciola hepatica*



Sign & Symptoms:

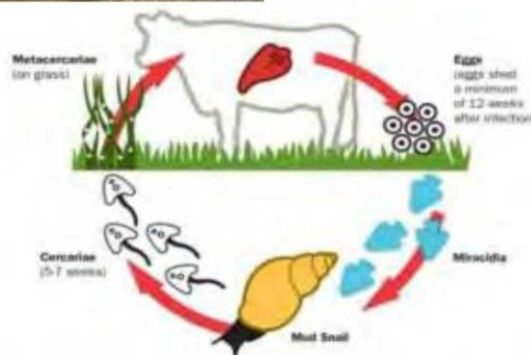


Yellow staining of the conjunctiva



Transmission:

1. Through snails, flies contact.
2. Contaminated food & water.
3. Rainy or pond water.
4. Grazing on contaminated land.
5. Unhygienic farm



LUNG WORM

Introduction of Disease & Etiology:

Parasitic bronchitis (husk) is an economically important parasitic infection of the bovine respiratory tract. Mortality occurs in heavy infections.

This disease is caused by the nematode, *Dictyocaulus viviparus*.

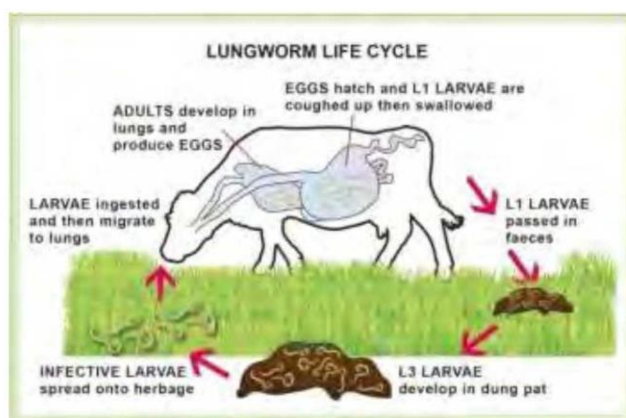


Sign & Symptoms:



Transmission:

1. Through contaminated feed
2. Grazing on contaminated land.
3. Grasses surrounding the lakes & pond.



TICK FEVER

Introduction of Disease & Etiology:

Anaplasmosis is a blood borne infection and transmissible protozoan disease also called rickettial disease. It is in form of 'tick fever' in cattle.

Disease in cows & buffaloes caused usually by *Anaplasma marginale*.



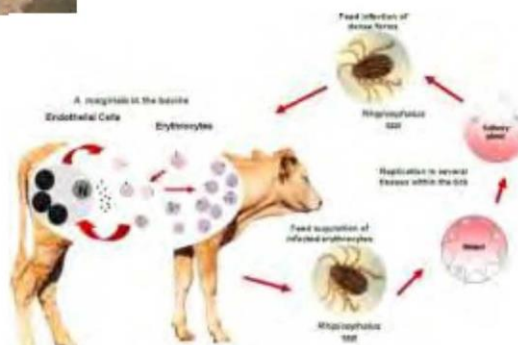
Rhipicephalus
spp

Sign & Symptoms:



Transmission:

1. Through tick bite.
2. Through flies.
3. Contaminated food & water



BABESIOSIS

Introduction of Disease & Etiology:

The disease is also called Texas fever, red water, piroplasmosis or tick fever.

A major tick-borne protozoan parasites disease of cattle. Older animals are more acutely affected. Clinical babesiosis is rare in cattle younger than six months.

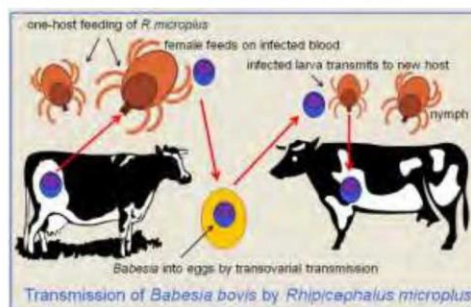
Caused by: *Babesia bovis*

Sign & Symptoms:



Transmission:

1. Incubation period: 7-10 days
2. Through tick infestation.
3. Contaminated food & water.
4. Unhygienic farm



THEILERIOSIS

Introduction of Disease & Etiology:

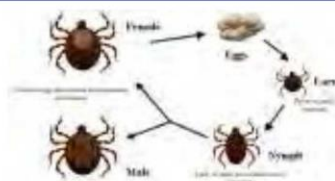
It is a protozoan disease of young exotic and crossbred cattle in Indo-Pak and not a contagious disease. Caused by species of

Theileria spp belongs to Family:

Theileridae.

Three most pathogenic and economically important species are:

1. *Theileria.annulata*
2. *Theileria.purva*
3. *Theileria.mutants*



Sign & Symptoms:



Transmission:

This disease caused by a specific tick i.e. *Hyloma*.



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ZOO-SANITARY



Separate water and feeding mangers for sick and healthy animals.



Isolate healthy animals within farm or on another farm/shed.



Hospital visit of sick animals should be discouraged.



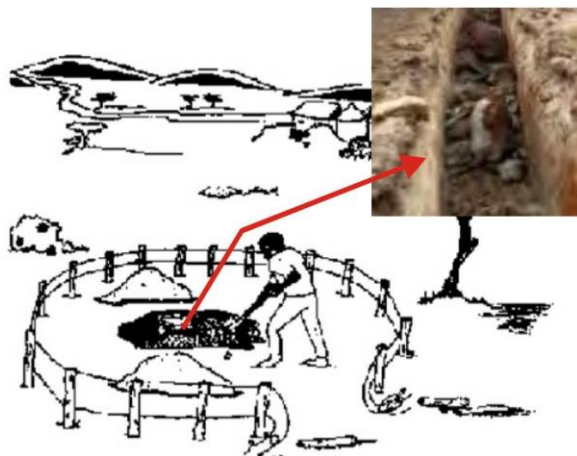
Neonatal/suckling calves should not be suckled or feed sick animal milk.



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ZOO-SANITARY



Dead animals should be buried properly and death areas sprayed with disinfectant/lime stone.



If sick animal slaughtered than site must be disinfected and blood/offals could be buried



Veterinarian / Veterinary Assistants can become the main source of spreading disease from one farm to another if not disinfected with clothes, body and shoes are not disinfected between visits.



Awareness programme for farmers to aware about the possible disease spread causes.



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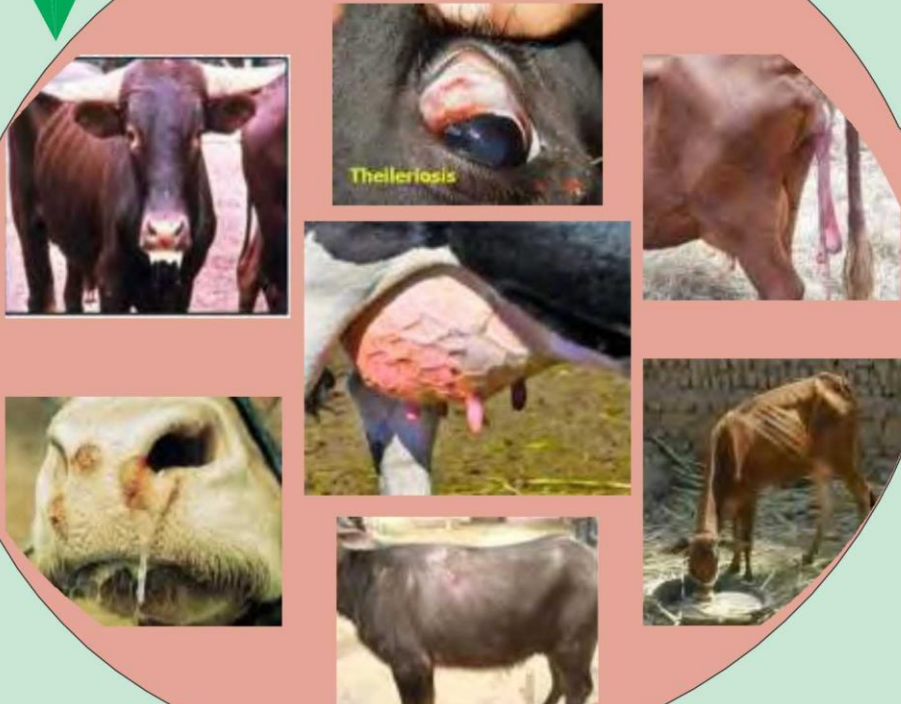
Healthy Animal



? Causes of Disease



Diseased Animal



? Economical Loss



LIST OF ILRI PUBLICATIONS IN PAKISTAN

Reports, Manuals/Books, Technical/Research publications, Software produced
by ILRI in Pakistan

➤ (Inquiries on these publications pl contact. Prof. M.N.M. Ibrahim: m.ibrahim@cgiar.org
or mnmi1946@gmail.com)



Reports

- 1 Dairy Value Chain Rapid Assessment: Tools for Participatory rural appraisal with Glossary - English & Urdu Terminologies (ILRI-AIP -Pub:001)
- 2 Dairy Value Chain Rapid Assessment in District of Punjab: Challenges and way Forward (ILRI-AIP -Pub:002)
- 3 Assessment and Evaluation of Constraints faced by Dairy Farmers and Khyber Pakhtunkhwa (ILRI-AIP -Pub:003)
- 4 Baseline Survey Report: Appraisal of Ruminant Livestock Sector in Punjab (ILRI-AIP -Pub:004)
- 5 Compendium of Economically Important Ruminant Diseases in Pakistan (ILRI-AIP -Pub:005)
- 6 Training manual on Modern Reproductive Technologies (ILRI-AIP -Pub:006)
- 7 Livestock Production in Mountainous Regions of Pakistan: A case study on district Bagh, Azad Jammu & Kashmir (ILRI-AIP -Pub:007)
- 8 Rapid Assessment of Small Ruminant Value Chain in Chakwal District, Pakistan (ILRI-AIP -Pub: 008a)
- 9 Small Ruminant Value Chain-Rapid Assessment: Village Level Case Studies from District Bahawalpur, Pakistan (ILRI-AIP -Pub: 008b)
- 10 Participatory Rural Appraisal with Female Livestock Farmers of District Swat, Khyber Pakhtunkhwa (ILRI-AIP - Pub: 009)
- 11 Livestock Farming Systems in Alpine Region of Pakistan: Gilgit- Baltistan and Azad Jammu & Kashmir (ILRI-AIP - Pub: 010)
- 12 Constraints for Long Term Development of Dairy Farming in Sindh and Balochistan: Livestock Management Perspective (ILRI-AIP -Pub: 011)
- 13 Livestock farming systems in Sindh: Challenges and way forward for formation of formal Milk Producer Groups (ILRI-AIP -Pub. 012)
- 14 Fodder Marketing Systems of Punjab: Impediments and Way forward (ILRI-AIP - Pub. 013)
- 15 Inception Workshop Report of the Sindh Agricultural Growth Project. (ILRI-SAGPL - Report 01)
- 16 Report on Training District Livestock Department Staff (DDL, ADL, VO'S, DFM'S, LLS & ILRI NATIONAL STAFF) on Dairy Production Technologies (ILRI-SAGPL - Report 02)
- 17 Report on Training District Field Extension Staff (AI Technicians, Livestock Inspectors, Stock Assistants, Livestock Assistants, LAB Technicians) on Dairy Production Technologies (ILRI-SAGPL - Report 03)
- 18 Report on Training of MPG (153) members on Animal Health Management and Feeds and Feeding (ILRI-SAGPL - Report 04)
- 19 Report on Training of MPG (153) members on Animal Reproduction and Breeding (ILRI-SAGPL - Report 05)
- 20 Report on Awareness Programs conducted in Model MPGs for members & non-members on "Farmer Centered Knowledge Sharing Program on Capacity Building Activities" (ILRI-SAGPL- Report 06).



Manuals/Books

- 1 Judging and Selection in Sahiwal Cattle (ILRI-AIP)
- 2 Judging and Selection in Beetal Goats (ILRI-AIP)
- 3 Nachi Goats: Judging and Selection Guide (ILRI-AIP)
- 4 A Training Manual on Artificial Insemination in Goats (English & Sindhi)
- 5 Feeding Dairy Cattle and Buffaloes: Training Manual for Extension Workers in Pakistan (English, Urdu & Sindhi) (ILRI-AIP/SAGPL)
- 6 Feeding Tables for Ruminants in Pakistan - English (ILRI-AIP)
- 7 Compendium for Forages and Feed Resources for Ruminants in Pakistan (English) - ILRI-SAGPL
- 8 Training Facilitator Guide on Animal Health Management (English, Urdu, Sindhi) - ILRI-SAGPL
- 9 Training Facilitator Guide on Feeds and Feeding (English, Urdu, Sindhi) - ILRI-SAGPL
- 10 Training Facilitator Guide on Reproduction & Breeding (English, Urdu, Sindhi) - ILRI-SAGPL



Technical Reports

- 1 Rhodes and Rye Grass Performance under various Agro-ecologies of Pakistan: Livestock Value Chain Perspective (ILRI-AIP - Technical Bulletin:01/2016)
- 2 Willingness to pay (WTP for Aflatoxin-Free Milk in Pakistan: Islamabad, Faisalabad and Lahore (ILRI-AIP - Technical Bulletin:02/2016)
- 3 Report on Farmer Participatory Trial on Free Access to Drinking Water and Feeding Roughages on Milk Production conducted at MPG Bhaloo Bhatti in District Mirpurkhas (ILRI-SAGPL-Technical Report)



Training Materials

- 1 Feeding Chart - Cattle (English, Urdu % Sindhi) - ILRI-AIP & SAGPL)
- 2 Feeding Chart - Buffaloes (English, Urdu % Sindhi) - ILRI-AIP & SAGPL)
- 3 Cow Calendar (English, Urdu % Sindhi) - ILRI-SAGPL.



Posters 4x3

- 1 ILRI Thematic areas
- 2 Artificial Insemination in Goat
- 3 Capacity Building: Way Forward to Change Mindset
- 3 Conventional and improved fodder production systems in Chakwal, Punjab
- 4 Herbal anthelmintic paves the way for economic control of internal parasites
- 5 Overview of Livestock sector in Sindh: Finding of snapshot and Forage surveys
- 6 Hydroponic: For Water and Land Scarce Areas?
- 7 Importance of free access to water and feed
- 8 Improved feeding management during reproductive stages of small ruminants leads to higher productivity.
- 9 Rangelands of Balochistan: current status, threats, opportunities for enhancing livelihood in the context of climate change.
- 10 Snapshot of the Dairy Sector in Balochistan
- 11 Snapshot Survey: An approach to identify best bets for interventions.
- 12 Status of Green Fodder Availability for Livestock in AJ&K: Constraints Solutions and Way Forward.
- 13 Vaccination calendar for small and large ruminants in Punjab.
- 14 Volunteer Farmer Training Models: Solution for Dilemma
- 15 Control of Peste Des petits Ruminants (PPR) in Pakistan
- 16 Investigating the Impact of Quality Protein Maize Grains.
- 17 Maize Silage Quality Assessment in Punjab
- 18 Guide to use the “feed chart” for Milking Cattle & Buffalo
- 19 Milk-in (Treble purpose) plastic can for milking, checking mastitis and transport.
- 20 Monitoring and Evaluation and Learning Plan



Fact sheets

- 1 Digestion in the rumen
- 2 Management of calves
- 3 Management of heifers
- 4 Oestrus cycle and heat detection
- 5 The in-calf cow
- 6 Fresh cow problems
- 7 Management of dry cows
- 8 Dry cow therapy - Mastitis control
- 9 Body condition scoring of dairy animals (cattle & Buffaloes)
- 10 The process of milking
- 11 Clean milk production
- 12 Water for dairy animals
- 13 Taking girth measurements & estimating Live Weight
- 14 Roughages for dairy cattle & buffaloes
- 15 Impact of free access to water & balanced feed on milk production
- 16 Feeding concentrates to dairy cattle and buffaloes
- 17 Minerals and dairy animals
- 18 Urea- Molasses-Mineral Lick Blocks

- 19 Pasture production
- 20 Mott grass: Cultivation and Nutritive Value for Ruminants
- 21 Rye grass: Cultivation and Nutritive Value for Ruminants
- 22 Rhodes grass: Cultivation and Nutritive Value for Ruminants
- 22(a) Rhodes grass (Tolghar): Cultivation and Nutritive Value for Ruminants
- 23 Alfalfa (Lucerne): Cultivation and Nutritive Value for Ruminants
- 24 Berseem: Cultivation and Nutritive Value for Ruminants
- 25 Sorghum: Cultivation and Nutritive Value for Ruminants
- 26 Para grass: Cultivation and Nutritive Value for Ruminants
- 27 Kallar grass: Cultivation and Nutritive Value for Ruminants
- 28 Oats: Cultivation and Nutritive Value for Ruminants
- 29 Jantar (Sesbania): Cultivation and Nutritive Value for Ruminants
- 30 Shaftal: Cultivation and Nutritive Value for Ruminants
- 31 Couch Grass: Cultivation and Nutritive Value for Ruminants



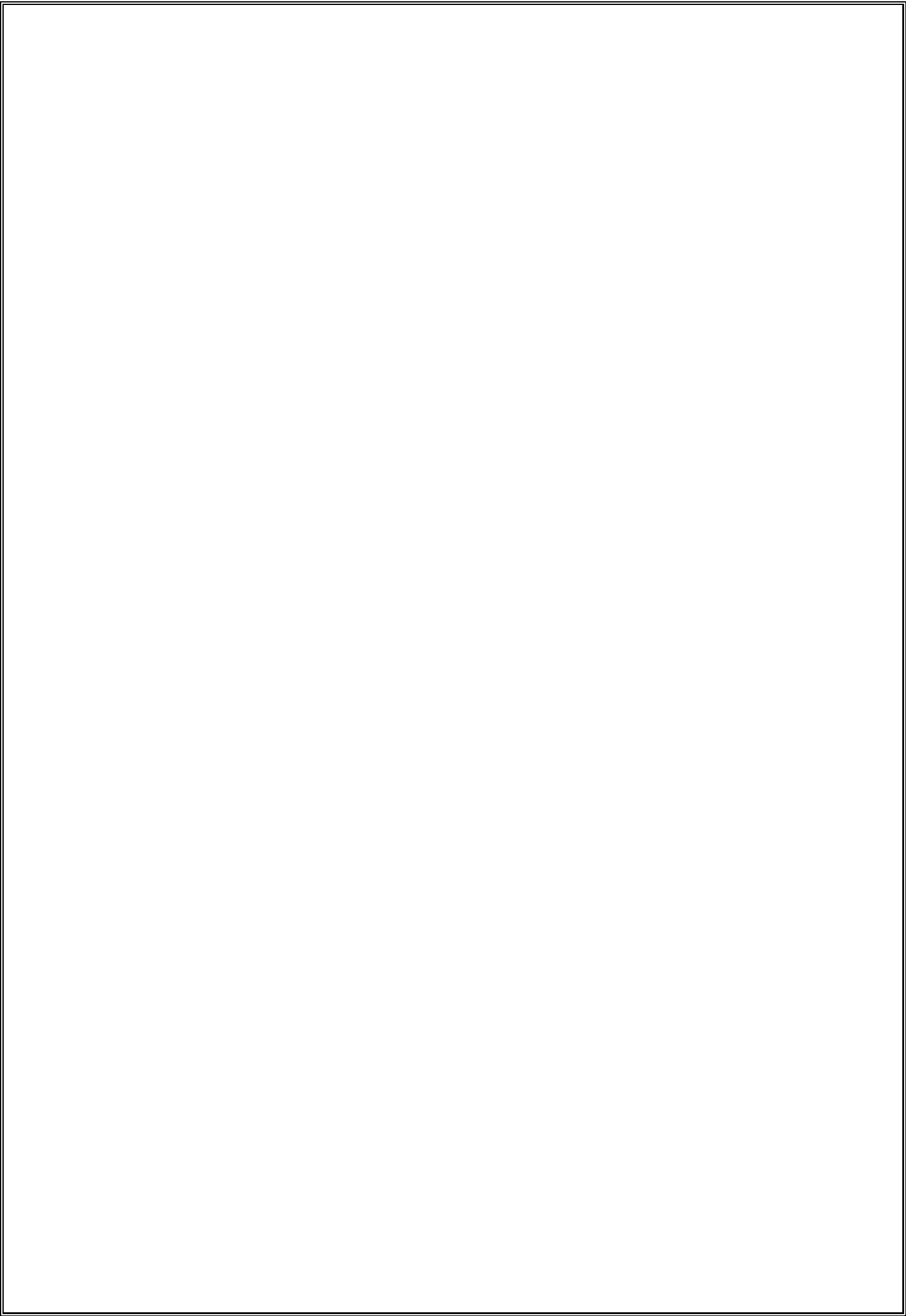
Diseases

- 1 Deworming (English & Urdu)
- 2 Vaccination (English & Urdu)
- 3 Tetanus (English & Urdu)
- 4 Pneumonia (English & Urdu)
- 5 Parasitic Injection (English & Urdu)
- 6 Mastitis (English & Urdu)
- 7 Foot and Mouth Disease-FMD (English & Urdu)
- 8 Esophageal Choke (English & Urdu)
- 9 Diarrhea (English & Urdu)
- 10 Bloat (English & Urdu)



Software

1. Ration Formulation for Cattle and Buffaloes using Pakistan Feeds for Animal Nutritionist and Veterinary Officers (Excel software) - ILRI-AIP
2. Ration Formulation for Cattle and Buffaloes using common feeds available in Pakistan for Extension staff and progressive farmers (Android and Web-based applications) - ILRI-SAGPL
3. Milk price calculator for MPG Milk Technicians (Android based)
4. Herd Management software for Farms and Progressive Farmers (Android and Web-based applications) - ILRI-SAGPL



Q & A on Animal Health Management

1. **What Step Do You Know for proper Animal Health Management?**
 - Appropriate husbandry
 - Good hygiene
 - Proper feed
 - Good management and
 - Proper Urination and Faeces discharge
2. **How you differentiate Healthy & Sick Animals?**
 - Rumination, Shiny Skin, Brighter Eyes, Look Active & Proper Urination & Defecation
3. **What do you know about Bio Security?**
 - The steps taken to prevent from infectious diseases affecting animals and the people who care for them.
4. **What are the Important Steps should be taken follow biosecurity plan?**
 - Quarantine newly arrival animals for 15 days.
 - Do not send animals for grazing with other flock/herd.
 - No dirt on boots
 - Quarantine unsold animal from the market.
 - Use of drench in order to kill the parasitic worms.
5. **What is role of farmer in Vaccination?**
 - Vaccine Knowledge. Dose, Route, Cold chain system,
 - Timing (early morning Late Evening)
 - Use of Proper syringes & Proper Needle, Proper Record Keeping in Health Card.
6. **Do you have any Knowledge about animal Disease?**
 - Yes we have the Knowledge of the Animal diseases such as:
 - F.M.D, H.S, Liver Fluke, Mastitis, Black Quarter and Brucellosis etc.
7. **Which animal disease do you know?**
 - Share Sign & symptoms
8. **What type of diseases effect on milk production?**
 - FMD, Mastitis, Liver Fluke etc etc
9. **What Important steps should be taken from farmer when animal get Disease?**
 - Isolate healthy animals within farm or on another farm/shed.
 - Separate water and feeding mangers for sick and healthy animals. Burn left over feed and fodder, disinfect these.
 - Hospital visit of sick animals should be discouraged.
 - Dead animal should be buried properly and death area sprayed with disinfectant/limestone.
 - Awareness programme for farmers to aware about the possible disease spread causes.

ISBN: 978-969-7564-10-1

Citation: E. Kang'the, S.A. Khan, M.N.M. Ibrahim and J.Githinji, 2020.
Training Facilitator guide on Animal Health Management. pp. 79.