

ONE HEALTH AND AGROECOLOGY

One Health within the scope of Sustainable Livestock Management

MODULE 1: Introduction to One Health and Agroecology



What is One Health?

ONE HEALTH MEANS WE ARE ALL CONNECTED

The health of people, animals, plants, and their shared environment are all connected. A problem in one can affect the others. For example, certain diseases can be passed between animals and humans. In the same way, when water or soil gets polluted, it harms both people and animals. So, to keep everyone healthy, we must take care of our animals and our surroundings too.

✳ Many health risks on farms can be better addressed using a One Health approach. ✳

ONE HEALTH IS NEEDED TO ADDRESS

● **Zoonotic diseases:** Diseases that pass between animals and people.

Understanding how diseases spread helps keeping farms and families safe:

If an animal gets sick with a zoonotic disease, it can spread not only to other animals but also to people handling these animals.

Collaboration to prevent and treat diseases is essential:

Farmers, doctors, vets, and other professionals must work together to prevent and manage health risks. Detecting and reporting illnesses in animals early can prevent wider spread to other animals and people.

● **Antimicrobial resistance (AMR):** Unsafe use of medicines can cause germs to become resistant to treatment.

Correct use of medicine protects health:

Using medicine both in humans and animals in the correct way, exactly as prescribed, brings the best benefits.

● **Food safety:** Measures to ensure that food is safe for human consumption.

Healthy animals mean safer food:

Food coming from sick animals should not be consumed. If a cow, for example, has an infected udder (mastitis) and the milk is still used, it can carry harmful germs that make people sick. Keeping animals healthy ensures safer food. In addition, contamination of food with animal medicines or other chemicals can make people sick.

● **Pollution:** Water or soil polluted by animal medicines, chemicals, plastic or other waste.

Avoid pollution to keep everyone safe:

If the water or soil near the farm gets polluted, this can harm the plants, animals, and the family's health. Medicines, chemicals, plastics, and other harmful waste should never enter water or soil. Protecting the farm environment protects everyone's health.

What is One Health?



What are Zoonotic Diseases?

Zoonotic diseases (also called zoonoses) are illnesses that can spread between animals and people.

SPOT AND STOP ZOOONOTIC DISEASES EARLY

Because farmers work closely with animals, their risk of getting zoonotic diseases is higher. But this also gives them a strong role in protection: spotting early signs of illness in animals, seeking help quickly, and preventing diseases from spreading in the farm and community.

ZOOONOTIC DISEASES CAN SPREAD THROUGH

- Touching sick animals.
- Consuming raw milk, undercooked meat or eggs.
- Bites from infected animals or via mosquitoes or ticks.
- Handling animal waste, urine, or birth fluids.
- Contact with contaminated tools, water, or feed.
- Inhaling dust or droplets from sick animals.

KNOW THE COMMON ZOOONOTIC DISEASES

Rabies

Spreads through the **bite or saliva of an infected animal** (mostly dogs, but also other animals).

Brucellosis

Spreads through **contact with infected animals** especially during **calving** and through **consumption of raw milk**.

Tuberculosis (bovine TB)

Spreads mainly through **drinking raw milk** from infected cattle or through **close contact with sick animals**.

Bird flu (Avian influenza)

Spreads when people **handle sick birds** (domestic poultry or wild birds) or **come in contact with their droppings**.

Salmonella

Spreads by **eating contaminated or undercooked meat, eggs, or raw milk**, and through **poor hygiene during food handling**.

EARLY DETECTION AND REPORTING ARE CRITICAL

1 Monitor animal health:

Watch for signs of illness in your animals, such as unusual behaviour, sores, or changes in productivity.

2 Report promptly:

If you notice signs of a zoonotic disease, report it immediately to local veterinary or health authorities.

3 Exchange within community:

Share knowledge and updates with fellow farmers so everyone can stay alert and respond quickly when problems arise.

What are Zoonotic Diseases?

ZOONOTIC DISEASES CAN SPREAD THROUGH:

Handling animal waste, urine, or birth fluids



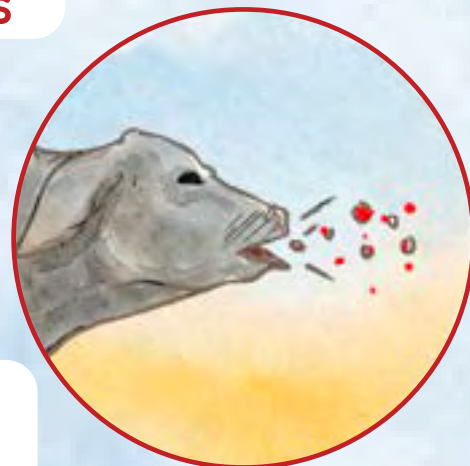
Consuming raw milk, undercooked meat or eggs



Touching sick animals



Bites from infected animals or via mosquitoes or ticks



Inhaling dust or droplets from sick animals



Contact with contaminated tools, water, or feed



COMMON ZOONOTIC DISEASES

- Rabies
- Brucellosis
- Tuberculosis (bovine TB)
- Bird flu (Avian Influenza)
- Salmonella

STOP AND PREVENT ZOONOTIC DISEASES

- Monitor animal health
- Report promptly
- Exchange within community

What is Food Safety?

Food Safety is about protecting food from anything that can make people sick, like germs, medicine residues, or harmful chemicals.

It applies to all stages of the food supply chain, from production on the farm to preparation and consumption. Farmers and food handlers must follow good farming practices, handle and store food properly, and prepare it hygienically.

*** When food is not safe, it can cause real harm. People may fall sick after eating it, especially children, older adults, or pregnant individuals. ***

COMMON SYMPTOMS OF FOOD-BORNE INFECTIONS

Effects of food-borne diseases range from diarrhoea to certain types of cancer or long-lasting disabilities.

Vulnerable groups, including infants, young children, pregnant individuals, elderly, sick people, and those with weakened immune systems, face a higher risk of severe illness or death from foodborne diseases.

IMPORTANT STEPS TO KEEP FOOD SAFE

1 Keep animals healthy:

- Feed animals good-quality, clean feed.
- Don't use milk, eggs and other food products from animals that don't seem healthy.
- Keep sick animals separate from healthy ones.
- If animals are treated with medicines, follow the correct dose and waiting time (withdrawal period).

3 Store food properly:

- Store milk, eggs and other foods in a clean and cool place away from pests like insects and rodents.
- Cover food to keep away dust, flies, rats, and moisture.
- Use only clean, food-safe containers (food-grade plastic or metal) for milking and storage of any food.

2 Keep everything clean:

- Wash your hands before and after milking animals, touching food, or handling equipment.
- Clean milking equipment, buckets, storage containers and areas regularly.
- Always use clean water.

What is Food Safety?

Every step counts - from the field and animals to the kitchen and plate.



What are Vector-Borne Diseases?

Vector-borne diseases are illnesses spread by small insects or animals called vectors, such as mosquitoes, ticks or flies.

These vectors can carry harmful germs (like viruses, parasites, or bacteria) and may pass them to people or animals when they bite.

The severity of vector-borne diseases can range from mild fever and body aches to serious complications like internal bleeding, brain infection, or organ failure. Children, the elderly, pregnant women, and people with weak immunity are at higher risk of severe illness.

✳ Early detection and timely medical care are crucial to prevent serious outcomes and death. ✳

SOME EXAMPLES RELEVANT FOR HUMAN HEALTH IN MADHYA PRADESH

● Dengue Fever

● Malaria

● Chikungunya

● Lymphatic Filariasis (also called Elephantiasis)

SPOT AND STOP VECTOR-BORNE DISEASES EARLY

Many vector-borne diseases are preventable through protective measures and community-level actions.

1 Protect yourself from bites:

Wear long-sleeved clothes, full-length trousers, and socks, especially at dawn and dusk when mosquitoes are most active. Always sleep under mosquito nets and use nets for infants and young children during the day. Use mosquito or tick repellents, such as creams, liquids, or coils, on exposed skin or in living areas.

3 Protect animals from vectors:

Ticks and mosquitoes can also bite livestock and pets, causing serious diseases and lead to blood-loss, stress, poor growth and weak animals. Keep cattle sheds and animal shelters clean and dry. In severe cases, apply tick-control medicines as directed by the veterinary department to protect animals.

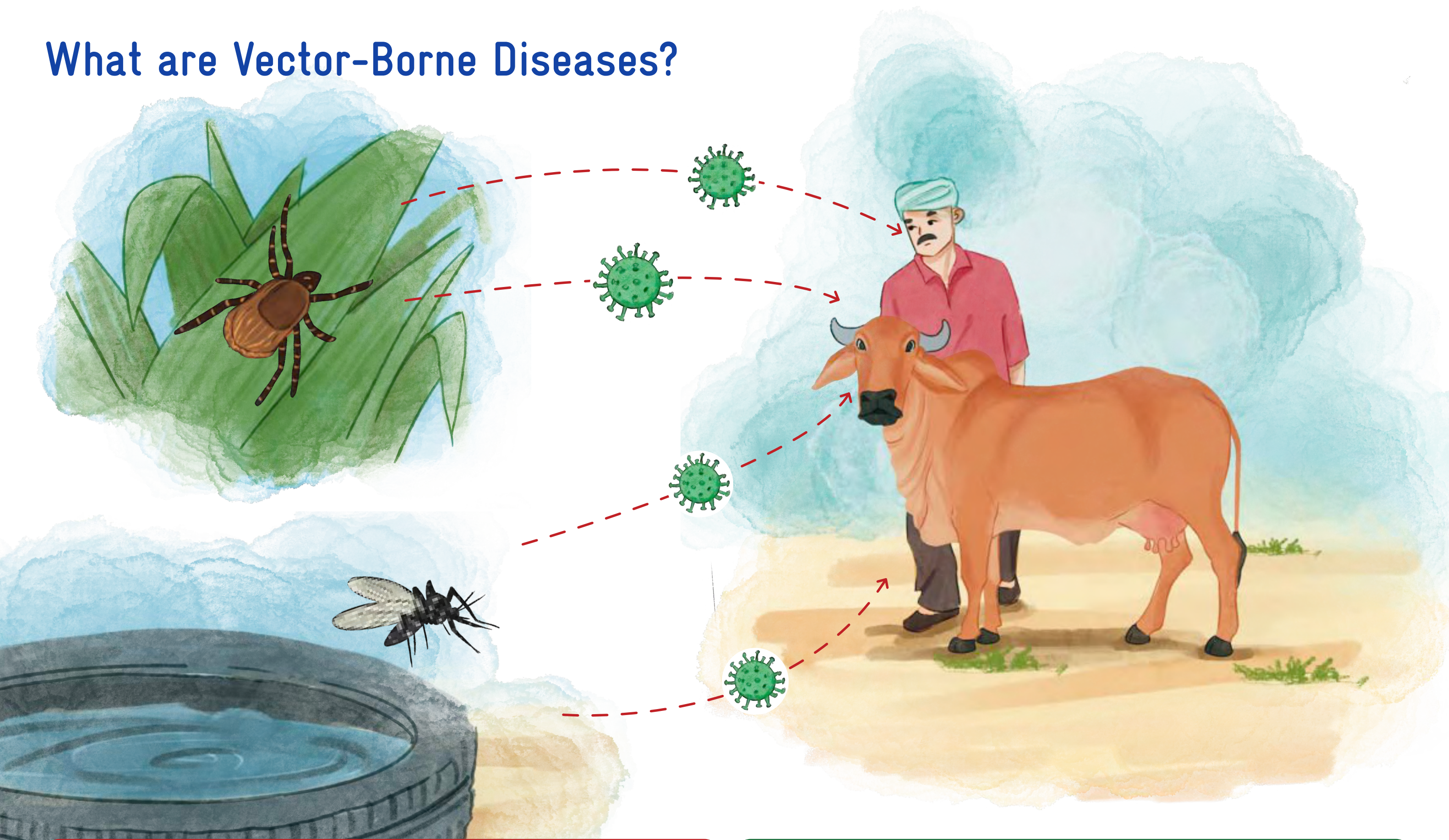
2 Reduce mosquito breeding:

Mosquitoes breed in stagnant water. Eliminate breeding sites and keep the surroundings clean. Do not allow water to collect in flowerpots, tyres, open tanks, or discarded containers. Clean drains and gutters regularly. Cover stored water in drums and tanks.

4 Seek medical help early:

If you develop fever, body aches, or rashes after a bite, consult a doctor immediately. Early diagnosis and treatment of diseases such as malaria, dengue, or tick-borne fevers can save lives.

What are Vector-Borne Diseases?



COMMON VECTOR-BORNE DISEASES IN HUMANS

- Dengue fever
- Malaria
- Chikungunya
- Lymphatic Filariasis (also called Elephantiasis)

STOP AND PREVENT VECTOR-BORNE DISEASES

- Protect yourself from bites
- Reduce mosquito breeding
- Protect animals from vectors
- Seek medical help early

What is Antimicrobial Resistance (AMR)?

Antimicrobials, like antibiotics and dewormers, have greatly improved the health of people and animals. But today, their overuse and misuse have caused a serious problem: Antimicrobial resistance (AMR)

WHAT IS AMR?

AMR happens when microbes (like bacteria or parasites) become more resistant and stop responding to medicines. This makes infections harder, or even impossible, to treat.

Because some diseases can affect both human and animal and sometimes similar medicine is used to treat these disease, AMR in animals can also harm human health.

HOW DOES AMR SPREAD?

Resistant germs can spread between humans, animals, and the environment. People can get resistant germs from animals through contaminated food (like undercooked meat, milk, or eggs), direct contact with animals, or exposure to soil, water, or waste contaminated with animal germs.

WHY IS AMR A PROBLEM?

As microbes become resistant to medicines:

- Infections take longer to heal and are harder to treat.
- Stronger or more expensive medicines may be needed.
- Some infections may become untreatable, increasing the risk of death.

WHAT CAUSES AMR?

AMR can develop when antimicrobials are:

1

Used when not needed:

For example, when given without proper diagnosis or when given to whole groups of animals, even if only a few are sick.

2

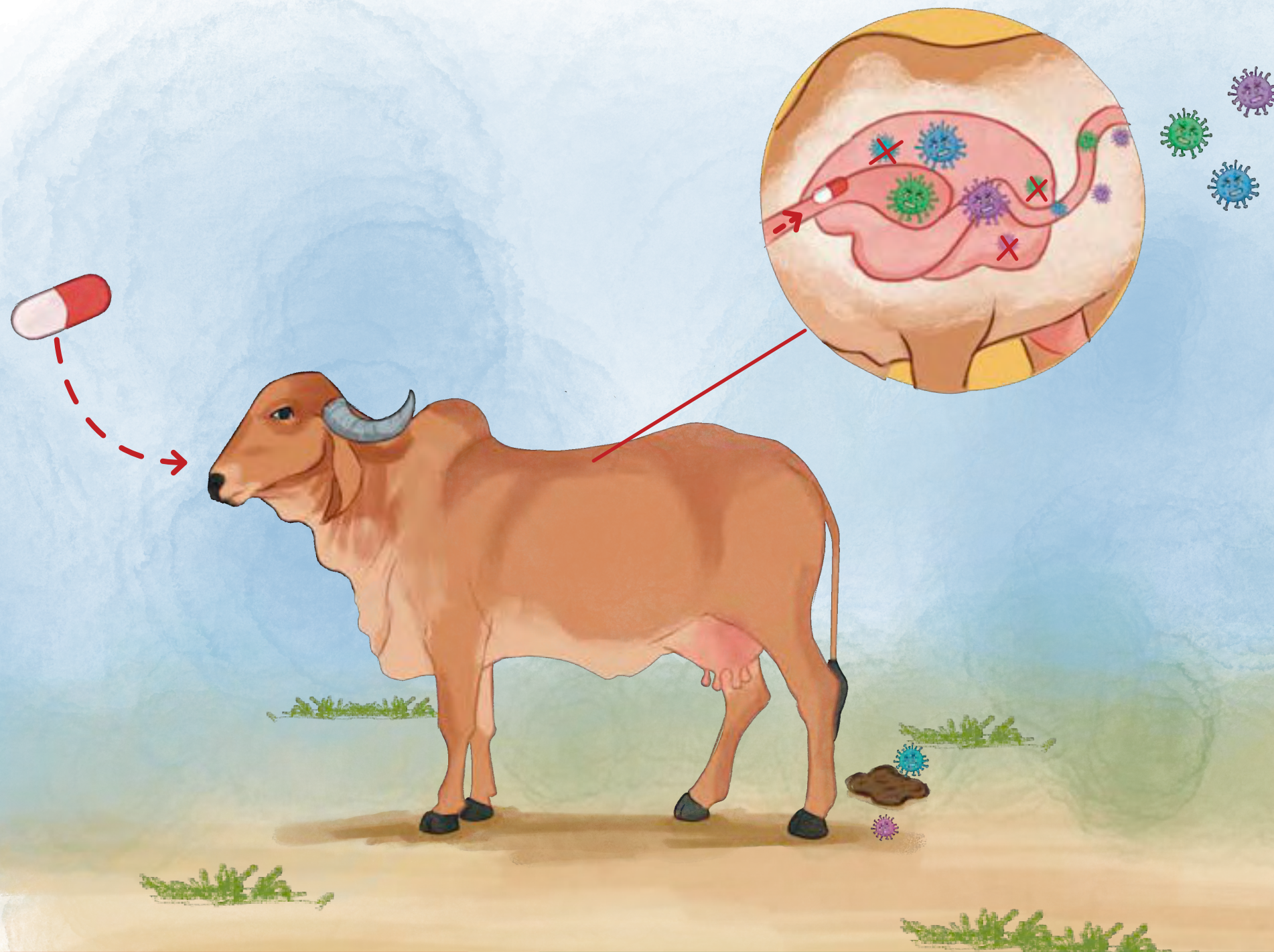
Used incorrectly:

Such as wrong dose, stopping treatment too early, using medicines too often, or using poor-quality or expired medicines.

HOW CAN FARMERS HELP PREVENT THE DEVELOPMENT AND SPREAD OF AMR?

- Only use animal medicine when truly necessary.
- Always follow a veterinarian's prescription.
- Buy medicines only from trusted sources.
- Use the correct dose, method of application and duration.
- Store and dispose of medicines safely.
- Keep records of treatments.
- Manage animal waste responsibly after treatment to avoid contaminating the environment.
- Improve animal care and hygiene so animals fall sick less often and treatment can be avoided.

What is Antimicrobial Resistance (AMR)?



WHAT CAUSES AMR?

- Use of medicines when not needed
- Incorrect use of medicines

PREVENT DEVELOPMENT AND SPREAD OF AMR

- Only use medicines when truly necessary
- Always follow a veterinarian's prescription
- Buy medicines only from trusted sources
- Use the correct dose, method of application and duration
- Store and dispose of medicines safely
- Keep records of treatment
- Manage animal waste responsibly after treatment
- Improve animal care and hygiene

What is Agroecology?

Agroecology is a way of farming that works in harmony with nature to create healthy, sustainable farms. It looks at the whole farming system – soil, plants, animals, insects, water, climate, people.

1 Use diversity to stay strong:

Grow different crops and keep various types and resilient breeds of livestock. When you rely on only one crop or a high-performance breed, a single disease, drought, or heatwave can reduce your production sharply. With diversity, some crops or animals will still do well, helping you maintain food and income even in challenging years.

2 Let nature support your farm:

Keep trees, grasses and natural spaces for birds, bees and other beneficial insects. These help with pollination and pest control which will improve crop yields, saving money on chemicals and labour.

3 Healthy soil = healthy farm:

Use compost, manure, mulching, crop rotation, and minimum tillage (less ploughing) to improve soil health. Healthy soil holds more water, resists erosion, and provides better nutrition to plants. This means stronger crops even in dry periods and fewer inputs needed.

4 Use fewer chemicals:

Reduce the use of chemical pesticides, fertilizers, and animal medicines. Use good practices, hygiene and natural pest control to keep your farm safe. Overuse of chemicals harms soil life, pollutes water, and increases costs. Using medicines wisely also reduces antimicrobial resistance (AMR), keeping treatments effective when truly needed.

5 Mix crops and animals:

Produce both crops and livestock on your farm so that each supports the other. Animal dung can fertilize fields, and crop residues can feed animals. This reduces waste, lowers feed and fertilizer costs, and creates a stronger, more self-reliant farm system.

6 Care well for your animals:

Provide clean water, shade, and space. Healthy, stress-free animals grow better, give more milk or meat and are less likely to fall sick.

7 Prevent diseases early:

Feed animals a balanced and healthy diet, keep their area clean, vaccinate them and check on their health daily to note any problems early. This prevents sickness and reduces the need for medicines.

AGROECOLOGY HELPS FARMERS BY

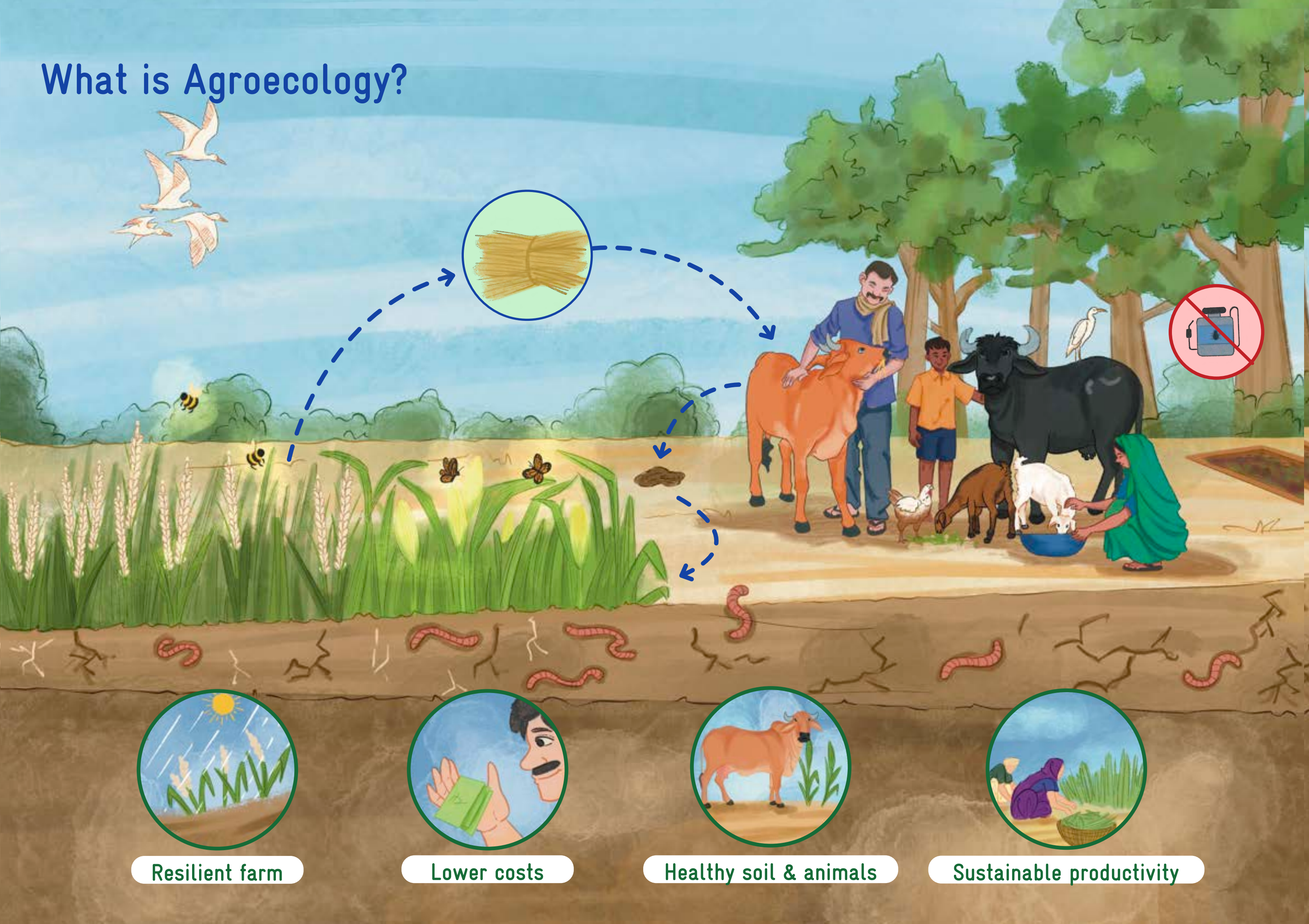
● Making the farm resilient.

● Reducing farming cost.

● Improving soil and animal health.

● Keeping the farm productive for many years.

What is Agroecology?



Resilient farm

Lower costs

Healthy soil & animals

Sustainable productivity

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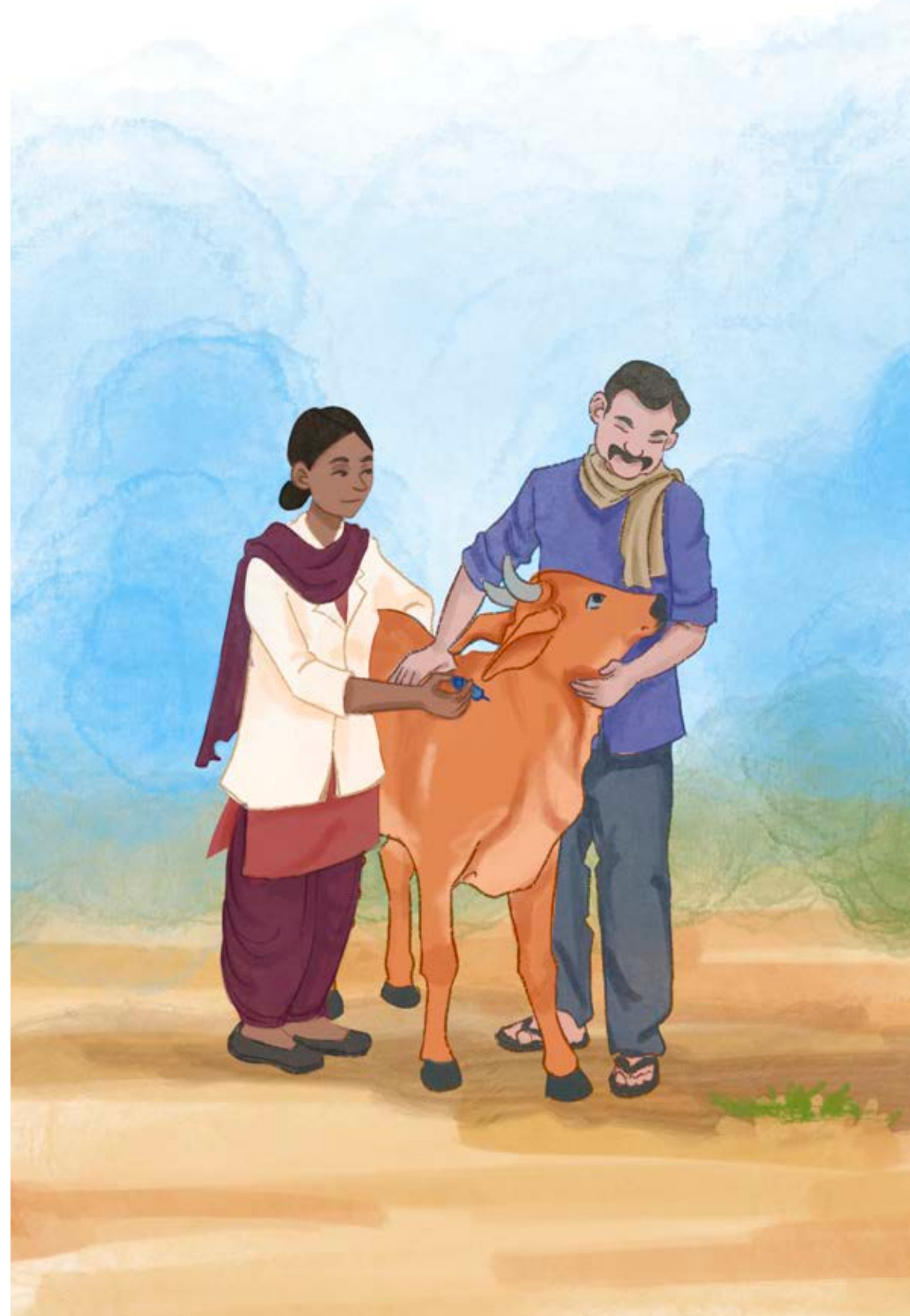
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One Health within the scope of Sustainable Livestock Management

MODULE 2: Preventing Animal Diseases



Why Animal Health Matters? Signs of Healthy and Sick Animals

Healthy animals produce more milk, eggs, and meat, resulting in higher farm productivity. In contrast, sick animals lead to losses, suffer, and may spread diseases to humans or other animals.

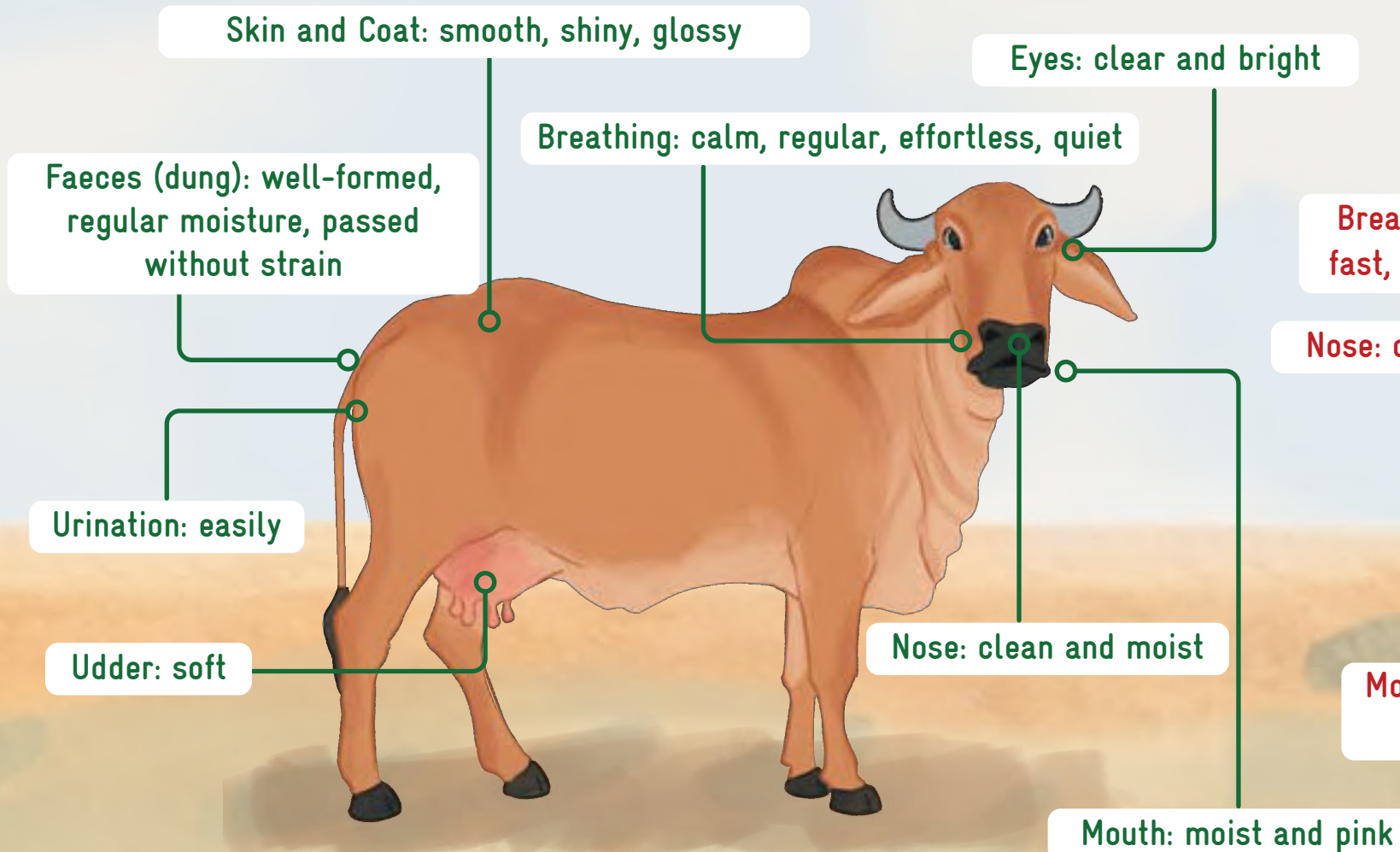
To check for signs of health or illness, observe the animal from a distance and carefully look at different aspects and body parts. Observe before handling the animal to avoid stress reactions which might change the behaviour. Record unusual findings and discuss with an animal health professional.

CATEGORY	SIGNS OF A HEALTHY ANIMAL	WARNING SIGNS - SEEK HELP
Behaviour and Attitude	Alert, active, responsive; regular interaction with herd	Weak, dull, isolating, unresponsive, change in resting behaviour, kicking belly, shaking head, grinding teeth, rubbing
Movement and Posture	Walks steadily and balanced, bears weight on all feet equally	Limping, reluctant or unsteady movement, arched back, lowered head
Body Condition	Well-muscled, moderate fat	Thin, severely underweight
Feeding, Productivity	Good appetite, eating as usual, normal rumination (consistent cud chewing), regular amount of milk	Not eating, less rumination, less milk
Skin and Coat / Feathers	Smooth, shiny, glossy	Rough coat, swellings, bald spots, wounds, crusts
Faeces (dung)	Well-formed, regular moisture, passed without strain	Watery, diarrhea, constipation, unusual texture
Urination	Easily	Difficulty urinating, bloody, dribbling or frequent attempts
Eyes	Clear and bright	Discharge, sunken, skin very red or pale,
Nose	Clean and moist	Discharge
Mouth	Moist and pink	Drooling, very red or pale gums, ulcers
Breathing	Calm, regular, effortless, quiet	Difficult, fast, noisy, coughing
Udder	Soft	Swollen, hot, painful

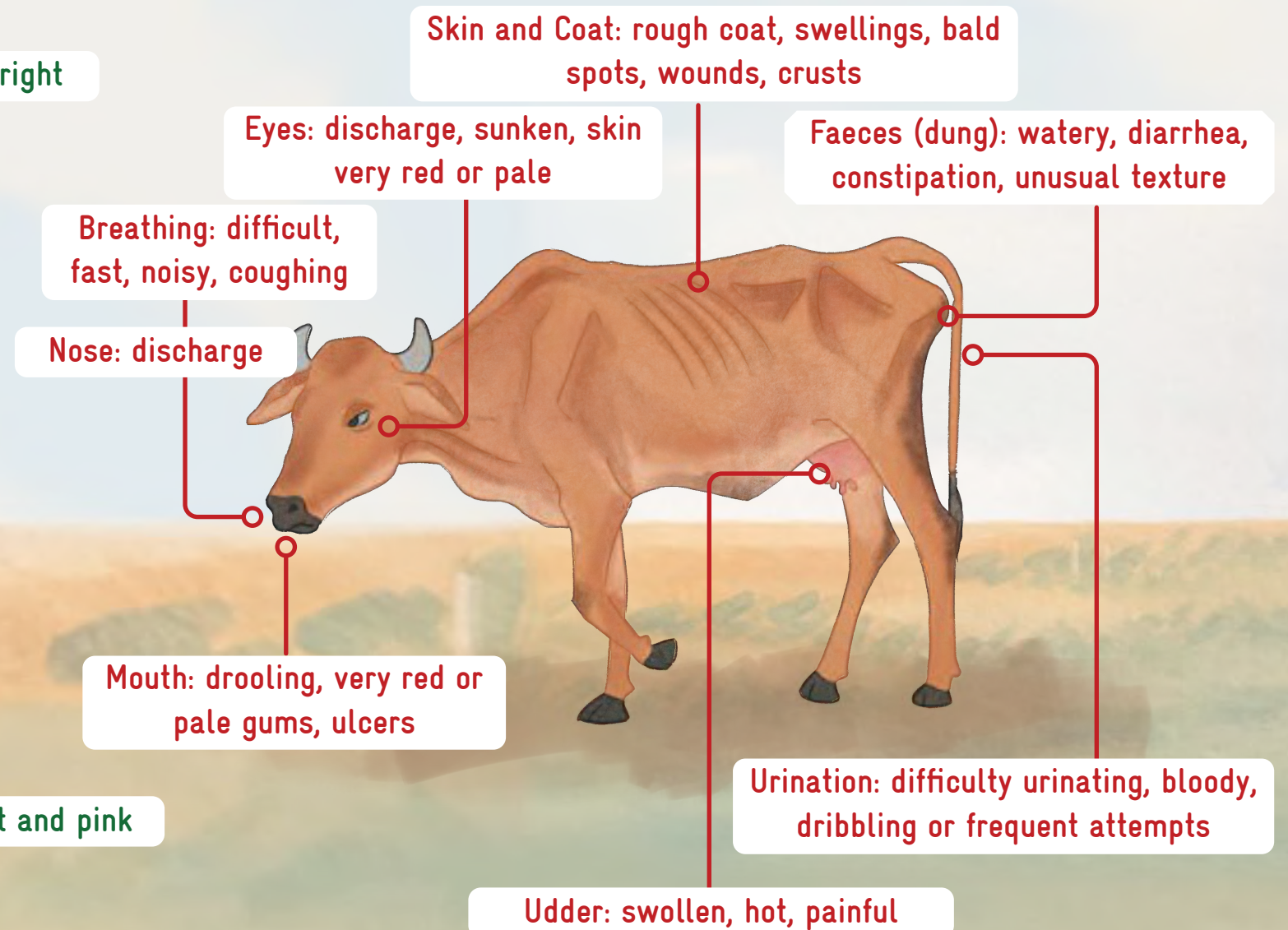
Why Animal Health Matters? Signs of Healthy and Sick Animals

Observe the animal from a distance and carefully look at different aspects and body parts.

SIGNS OF A HEALTHY ANIMAL



WARNING SIGNS - SEEK HELP



Check: ● Behaviour and attitude ● Movement and posture ● Body condition ● Feeding and productivity

- Alert, active, responsive; regular interaction with herd
- Walks steadily and balanced, bears weight on all feet equally
- Well-muscled, moderate fat
- Good appetite, eating as usual, normal rumination (consistent cud chewing), regular amount of milk

- Weak, dull, isolating, unresponsive, change in resting behaviour, kicking belly, shaking head, grinding teeth, rubbing
- Limping, reluctant or unsteady movement, arched back, lowered head
- Thin, severely underweight
- Not eating, less rumination, less milk

Preventing Animal Diseases and Their Spread

Preventing animal diseases is better, cheaper, and safer than treating them, both for animals and people.

Most animal health problems can be prevented through good care – especially housing, hygiene and nutrition and by giving timely treatment when needed.

✱ Some animal diseases can spread to humans (zoonotic diseases), so protecting livestock also protects your families and communities. ✱

HOW DISEASES SPREAD

1 Direct contact:

Through skin contact, saliva, milk, mating or shared equipment like milking tools, or feeding containers.

2 Dirty food or water:

Via contaminated feed and water (e.g., contaminated with dung or urine).

3 Air:

When sick animals cough or sneeze.

4 Insects:

Ticks, flies, and mosquitoes can carry diseases.

RISK POINTS OF DISEASES SPREADING FROM ANIMALS TO HUMANS

- Handling sick animals
- Milking
- Assisting births
- Shared water sources
- Improper disposal of dead animals

1 Biosecurity:

- Quarantine new animals for 10–14 days in a separate enclosure away from the main herd to monitor for signs of illness and prevent the introduction of diseases into the herd.

2 Personal hygiene:

- Wear personal protective equipment (PPE) such as gloves, boots, masks, and protective clothing during high-risk activities like assisting in calving, handling sick or dead animals, cleaning animal sheds, spraying chemicals, or disposing of carcasses and waste to reduce the risk of infection and chemical exposure.
- Wash hands thoroughly with soap and clean water before and after handling animals, milking, feeding, cleaning sheds, or treating sick livestock to prevent the spread of diseases between animals and from animals to humans.

3 Handling dead animals:

- Remove dead animals from herd immediately.
- Bury them in a pit (minimum 0.5 m depth) and pour quick lime solution on the carcass;

- the pit should be away from the farm and not close to a water source like river.
- Alternatively: burn dead smaller animals like chicken.
- Wear protective equipment and afterwards clean your hands with water and soap.
- Never eat a carcass of an animal that you found dead or that died of a disease.

4 Milking hygiene tips:

- Wash hands before and after milking.
- Clean the udder and teats with water and dry them with a clean cloth.
- Use clean buckets and cans – wash after every use with soap and clean, hot water and let equipment dry thoroughly before next use.
- Milk in a clean area.
- Check milk for clots, blood, or pus – don't use if found.
- Keep dung and dirty water away from milking area.
- Boil milk before drinking and store refrigerated in clean, covered containers.

5 Vaccination & record keeping:

- Follow the locally recommended vaccination schedule. Ask a trained animal health worker for advice and help with vaccinations.
- Keep track of your herd health by taking notes and keeping records.

Preventing Animal Diseases and Their Spread



RISK POINTS OF DISEASES SPREADING FROM ANIMALS TO HUMANS

- Handling sick animals
- Milking
- Assisting births
- Shared water sources
- Improper disposal of dead animals

Respiratory Diseases: Watch for Cough, Fever, and Breathing Problems

Significant animal diseases that primarily affect the respiratory systems, including nose, airways, and lungs.

Hemorrhagic Septicemia (HS) Cause: A serious bacterial disease caused by <i>Pasteurella multocida</i>. At risk: Mainly cattle and buffalo; young or weak animals are most at risk. Signs: High fever, labored breathing, open-mouth breathing, nasal discharge, sudden death, swelling under jaw/throat. Effects: Can kill animals very quickly. Causes loss of milk, weight, and high treatment costs. Notes: Outbreaks often happen during rainy season.	Pasteurellosis (non-HS forms) Cause: Bacterial infection from <i>Pasteurella</i> or <i>Mannheimia</i> species. Often starts after stress or another illness. At risk: Sheep, goats, and cattle. Stress, poor nutrition, transport, or overcrowding increase the risk. Signs: Runny nose or eyes, fever, coughing, heavy breathing, open-mouth breathing, loss of appetite. Effects: Can spread quickly, reduced milk production, slower growth, and occasional death. Notes: Early veterinary care is important.	Bovine Tuberculosis (bTB) - ZONOTIC Cause: Long-lasting bacterial infection. At risk: Mainly cattle, but also other livestock and wild animals. Can infect humans (zoonotic). Signs: Chronic cough, very thin and weak animals, enlarged lymph nodes, poor productivity. Effects: Causes slow weight loss and reduced productivity. Notes: bTB can also spread from wildlife to livestock and back, through shared grazing or water. Therefore, keep animals away from forest edges and wildlife areas. bTB is zoonotic, which means it can also spread to humans, mainly through raw milk and sometimes through direct contact with infected animals.
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PREVENTION STRATEGIES

1 Vaccinate regularly:

Vaccinate against HS and pasteurellosis (before rainy season) to protect your herd.

2 Ensure good ventilation:

Ensure ventilation in sheds to remove heat, moisture, dust, and ammonia. Clean air reduces lung irritation and lowers the chance of respiratory infections.

3 Quarantine:

Keep new animals separate for at least 2 weeks before mixing to prevent introducing new diseases to herd.

4 Good nutrition:

Provide nutritious, clean feed, water, and minerals – strengthens immunity to fight illness.

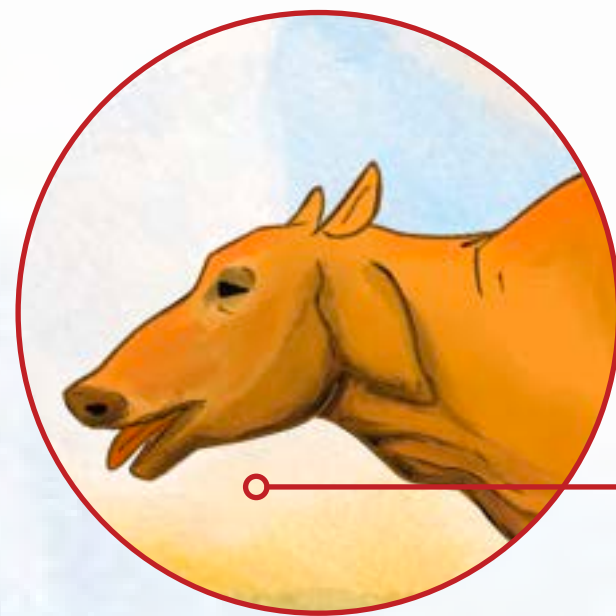
5 Reduce stress:

Reduce stress from overcrowding, weather, travel, or rough handling – stress makes animals more likely to get sick.

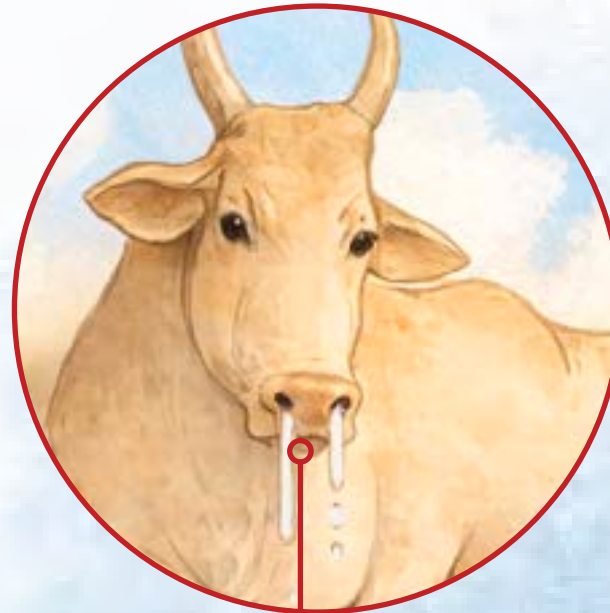
6 Hygiene:

Clean hands, tools, and buckets before and after use to stop spread of germs between animals.

Respiratory Diseases: Watch for Cough, Fever, and Breathing Problems

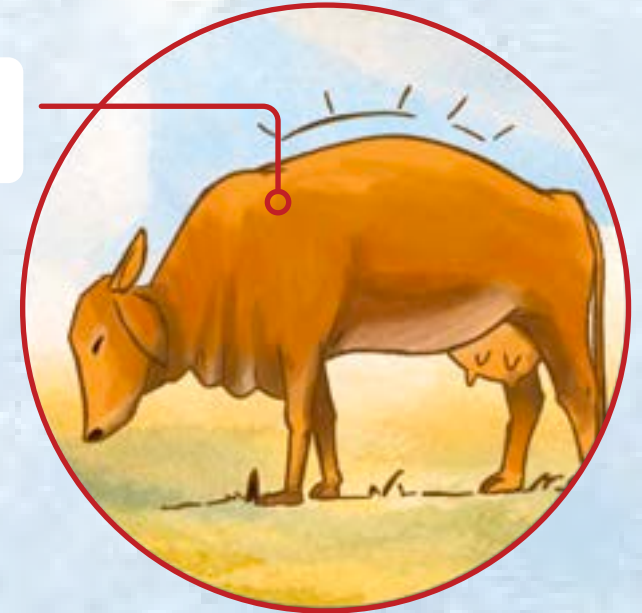


Open-mouth
breathing

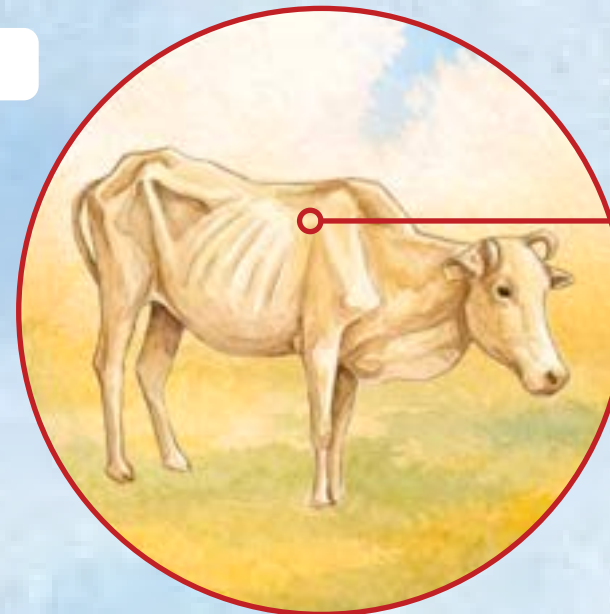
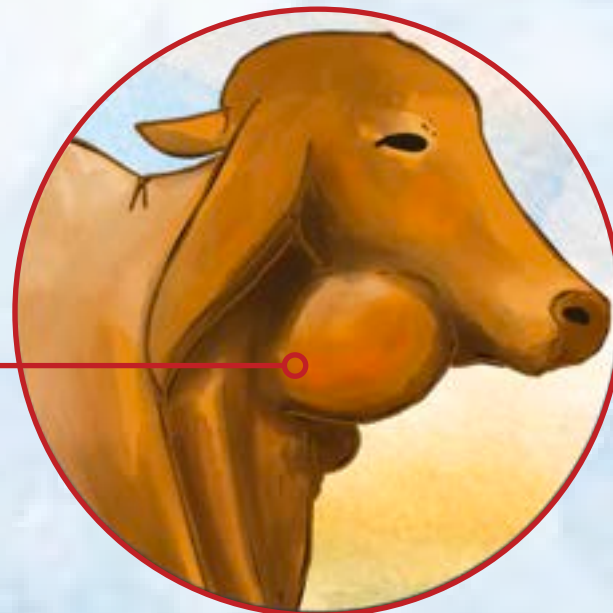


Nasal discharge

Head lowered,
hunched posture



Swelling on
throat



Very thin

COMMON RESPIRATORY DISEASES

- Hemorrhagic Septicemia (HS)
- Pasteurellosis (non-HS forms)
- Bovine Tuberculosis (bTB) - ZOO NOTIC

PREVENTION STRATEGIES

- Vaccinate regularly
- Quarantine
- Reduce stress
- Ensure good ventilation
- Good nutrition
- Hygiene

Digestive Health: Prevent Diarrhea, Bloat, and Indigestion

Significant conditions in animals that primarily affect the digestive system.

✱ Note: Some types of diarrhea can spread between animals but also to humans. Be careful when handling animals with diarrhea and maintain good hygiene when cleaning dung or their area. ✱

COMMON CONDITIONS PREVALENT IN THE AREA

Bovine Viral Diarrhoea (BVD)

- Cause:** Viral infection that affects the intestine and immune system.
- At risk:** Cattle of all ages; young animals more severely.
- Signs:** Watery or bloody diarrhoea, fever, mouth ulcers, weakness.
- Effects:** Reduced milk yield, slower growth, weak calves.
- Notes:** Infected animals can spread the virus even before showing symptoms. Vaccination is the most effective preventive measure.

Enterotoxaemia (in Sheep and Goats)

- Cause:** Bacteria (*Clostridium perfringens*) in the intestine that multiply fast when animals overeat rich feed or graze lush pasture.
- At risk:** Well-fed, fast-growing animals or those suddenly fed high-grain or lush diets.
- Signs:** Sudden death, bloating, diarrhoea, staggering.
- Effects:** Very high mortality, especially in young animals.
- Notes:** Vaccination is the most effective protection; avoid sudden feed changes.

Digestive Upsets in Ruminants (Indigestion & Bloat)

- Cause:** Poor-quality feed, sudden diet changes, or overeating lush fodder can disturb the rumen. Gas may build up, leading to bloating.
- At risk:** Animals under feed stress (hungry) or those introduced suddenly to new pastures.
- Signs:** Loss of appetite and dullness, reduced rumination or irregular dung, swollen or hard belly, especially left flank, restlessness, kicking at belly, drooling, severe bloat.
- Effects:** Reduced feed efficiency and milk yield, weakness and poor growth, in severe cases (bloat) death within hours if untreated.

PREVENTION STRATEGIES

1 Good nutrition:

Provide balanced feed with enough roughage and minerals to keep digestion and immunity strong.

2 Avoid sudden changes:

Avoid sudden diet changes and introduce new feeds gradually over several days to let animals adjust. Watch animals closely after pasture change or feed change.

3 Body condition:

Check animals regularly and give supplements during dry or lean seasons to prevent weakness and malnutrition.

4 Vaccination:

Vaccinate where vaccines are available (e.g. for Enterotoxaemia, BVD).

5 Pasture management:

Avoid grazing in areas with toxic plants (e.g. ghaneri, aak/madar, dhatura, arandi/castor bean). Inspect grazing areas before using as pasture. Watch for early signs of poisoning such as excessive salivation and seek veterinary help immediately.

6 Avoid trash feeding:

Don't let animals feed on trash, especially plastic waste. Eating plastic can block their stomach, reduce appetite and milk yield, and may lead to serious illness or death, especially in cows and sheep.

7 Reduce scavenging:

Provide enough clean feed so animals are not tempted to eat harmful plants or waste.

8 Isolation:

Keep animals with diarrhea separate to prevent infection spread through dung or contact.

Digestive Health: Prevent Diarrhea, Bloat, and Indigestion

DON'T LET ANIMALS FEED ON TRASH



TOXIC PLANTS



Ghaneri (*Thevetia peruviana*)



Aak/Madar (*Calotropis gigantea* (purple), *Calotropis procera* (white))



Dhatura (*Datura stramonium*)



Arandi/Castor bean (*Ricinus communis*)

COMMON CONDITIONS AFFECTING DIGESTIVE HEALTH

- Bovine viral diarrhoea (BVD)
- Enterotoxaemia
- Digestive upsets in ruminants (indigestion & bloat)

PREVENTION STRATEGIES

- Good nutrition
- Body condition
- Pasture management
- Reduce scavenging
- Avoid sudden changes
- Vaccination
- Avoid trash feeding
- Isolation

Reproductive and Udder Health: Keep Cows Fertile and Milk Safe

Mastitis

Cause:	Infection of the udder, usually by bacteria entering through the teat.
At risk:	Lactating dairy animals, especially those that have recently calved, have poor milking hygiene, or are stressed. Poor sanitation or high humidity environments also increase risk.
Signs:	Swollen, hot, or painful udder; milk of a diluted white colour, clots or pus in milk; reduced milk yield.
Effects:	Loss of milk, poor calf growth if feeding affected milk, economic losses.
Notes:	Milk from infected animals should never be consumed. Early treatment prevents worsening.

Brucellosis - ZONOTIC

Cause:	Bacterial infection that affects reproductive organs; zoonotic (can infect humans). It spreads through contact with infected animals especially during calving or handling reproductive tissues, aborted fetus and through consumption of raw milk.
At risk:	Cattle, buffalo, sheep, goats; farmers assisting with births.
Signs:	Abortion in late pregnancy, infertility, swollen joints.
Effects:	Reduced fertility and milk production; zoonotic risk to humans.
Notes:	Do not consume raw milk. Report abortions to vet.

Other reproductive problems to watch for

- Retained placenta (placenta not expelled within 12 hours).
- Uterine infections or metritis (foul-smelling discharge, fever).
- Vaginal or uterine prolapse.
- Difficult or prolonged calving.

✱ These conditions require urgent veterinary attention to prevent serious illness, death, or reduced fertility. Contact a veterinarian immediately if any of these signs appear. ✱

Other signs of reproductive problems include **poor fertility** or **anestrus**, such as females not conceiving after repeated breeding or showing no heat signs. These problems are often linked to nutrition.

PREVENTION STRATEGIES

1 Good nutrition:

Ensure mineral-rich, balanced diet for breeding and lactating animals to prevent fertility problems and metabolic problems during lactation.

2 Hygiene:

Practice strict hygiene during high-risk activities like calving/assisted births and milking to prevent uterine or udder infections and zoonotic diseases such as Brucellosis.

3 Personal protection:

Ensure hygiene and wear gloves during assisted births or when touching vaginal discharges to avoid getting infected yourself or spreading infections.

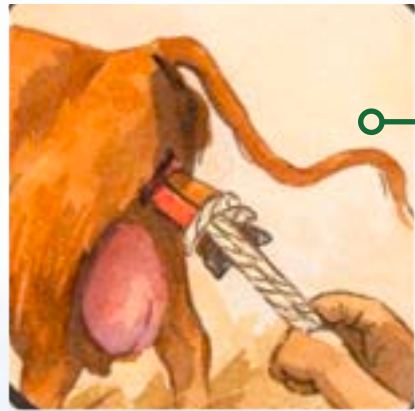
4 Food safety:

Boil milk before drinking.
Never consume milk from animals with mastitis, that had an abortion or seem sick.

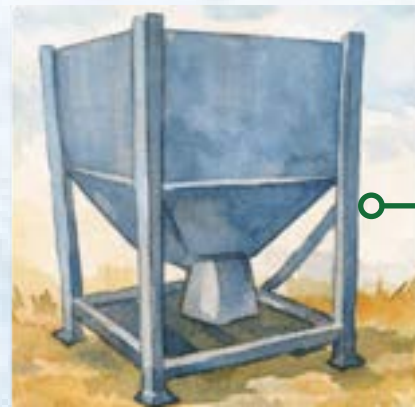
5 Isolate:

Keep animals that had an abortion separate. Follow veterinary guidance for care and management. Dispose of placenta or aborted calves safely, in accordance with biosafety protocols (see section on handling dead animals).

Reproductive and Udder Health: Keep Cows Fertile and Milk Safe



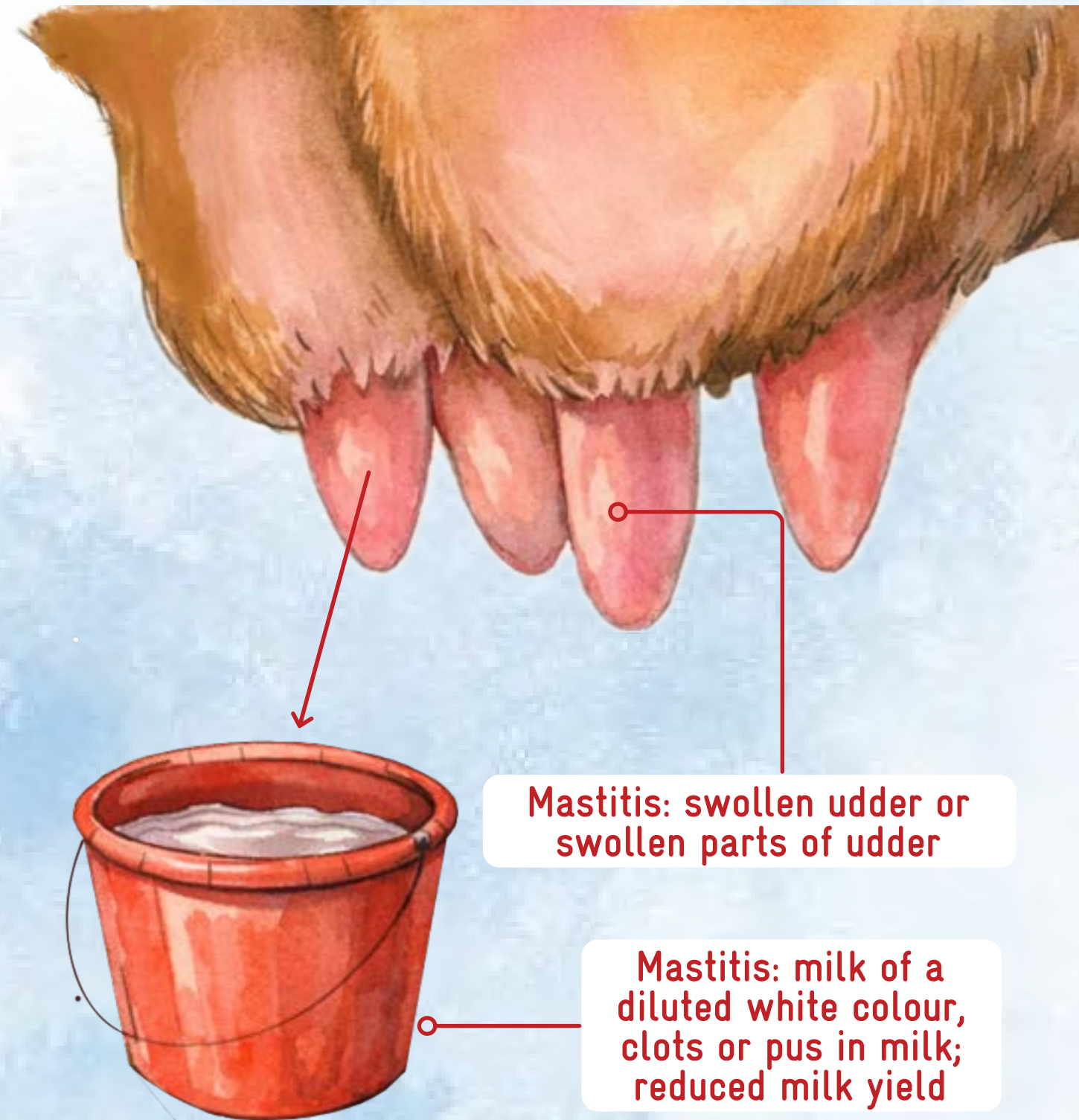
Personal hygiene and
biosecurity



Good nutrition



Boil milk before consumption



COMMON CONDITIONS AFFECTING REPRODUCTIVE HEALTH

- Mastitis
- Retained placenta
- Uterine infections or metritis
- Brucellosis - ZONOTIC
- Difficult or prolonged calving
- Vaginal or uterine prolapse

PREVENTION STRATEGIES

- Good nutrition
- Personal protection
- Isolate
- Hygiene
- Food safety

Skin, Coat and Hoof: Spot Infections and Injuries Early

Healthy hooves and skin are essential for animals to move comfortably and stay productive.

✳️ **Note:** Some conditions affecting hooves and skin are highly contagious, serious, and / or zoonotic (can spread to humans). ✳️

Farmers should recognize obvious signs of diseases like foot and mouth disease or lumpy skin disease early and **notify a veterinarian immediately** to prevent larger outbreaks. Here's what to watch for and how to manage common conditions:

Foot and Mouth Disease (FMD)

Cause:

At risk:

Signs:

Effects:

Notes:

Viral infection that affects the mouth, hooves, and teats.

Cattle, buffalo, sheep, goats, pigs; all ages, young animals most severely.

Fever, drooling, blisters on mouth, tongue, or hooves, lameness, reduced milk yield, can be fatal.

Highly contagious; causes heavy milk and income loss, trade restrictions.

Vaccinate twice a year, isolate sick animals, inform a veterinarian, and disinfect sheds.

Lumpy Skin Disease (LSD)

Cause:

At risk:

Signs:

Effects:

Notes:

Viral infection transmitted by biting insects or direct contact.

Cattle and buffalo.

Fever, skin nodules, swollen lymph nodes, lameness, reduced milk yield, can be fatal.

Very contagious, significant economic losses, trade restrictions.

Vaccinate, isolate affected animals, inform a veterinarian, and monitor for outbreaks.

Black Quarter (Blackleg)

Cause:

At risk:

Signs:

Effects:

Notes:

Bacterial infection (*Clostridium chauvoe*) affecting muscles.

Cattle and buffalo, especially young animals.

Sudden lameness, swelling with gas under the skin, fever, dead muscle tissue.

Rapid death; not a major risk to humans but dangerous to livestock and wildlife.

Vaccinate, inform a veterinarian.

Ringworm (Fungal Infection) - ZONOTIC

Cause:

At risk:

Signs:

Effects:

Notes:

Contagious fungal infection of the skin.

Cattle, buffalo, sheep, and goats; can infect humans.

Round, hairless patches with grey scabs or dry, crusty skin.

May affect productivity and growth in animals; skin and nail damage can become permanent when untreated, also in humans.

Wear gloves when handling infected animals, isolate affected animals, and treat with vet-recommended medicines.

GENERAL PREVENTION STRATEGIES:

- 1 Monitor regularly:
- Check animals daily for lameness, cuts, swelling, or other injuries to catch problems early.
- 2 Hoof care:
- Check and trim hooves regularly to prevent overgrowth and infections like foot rot. Disinfect trimming tools between animals to prevent cross-contamination. Keep pens and pastures dry since wet, muddy conditions promote the growth of bacteria responsible for foot rot.
- 3 Bedding:
- Provide soft, clean bedding to prevent pressure sores.
- 4 Wound care:
- Clean minor cuts or scratches promptly to prevent secondary infections; use antiseptics if available.
- 5 Early attention:
- Treat problems quickly to stop them from becoming serious and costly.
- 6 Veterinary support:
- Seek professional help if signs persist or worsen to ensure proper diagnosis and treatment.

Skin, Coat and Hoof: Spot Infections and Injuries Early

Check animals daily for lameness, cuts, swelling, or other signs of injuries.



COMMON CONDITIONS AFFECTING SKIN, COAT & HOOF

- Foot and mouth disease (FMD)
- Black quarter (Blackleg)
- Lumpy skin disease (LSD)
- Ringworm (Fungal Infection) - ZOOONOTIC

PREVENTION STRATEGIES

- Monitor regularly
- Bedding
- Early attention
- Hoof care
- Wound care
- Veterinary support

Poultry Health: Know the Signs, Prevent Early

Many poultry diseases spread quickly through a flock. Early detection of illness can prevent losses and spread.

PRIORITY POULTRY DISEASES

Newcastle Disease (ND / Ranikhet)

- Cause:** Viral infection affecting the respiratory, digestive, and nervous systems.
- At risk:** Chickens and other poultry; all ages, especially young birds.
- Signs:** Coughing, sneezing, nasal discharge, diarrhea, paralysis, trembling, sudden death.
- Effects:** Highly contagious; can cause high mortality and severe drop in egg production.
- Notes:** Vaccinate regularly, isolate sick birds, maintain strict hygiene, and disinfect housing and equipment.

Infectious Bursal Disease (IBD / Gumboro)

- Cause:** Viral infection targeting the immune system.
- At risk:** Young chickens (3–6 weeks old) are most vulnerable.
- Signs:** Depression, ruffled feathers, diarrhea, dehydration, sudden death.
- Effects:** Weakens immunity, making birds more prone to other infections; can reduce productivity.
- Notes:** Vaccinate according to local schedules, keep the environment clean, and avoid introducing infected birds

Marek’s Disease (MD)

- Cause:** Viral infection causing tumors and nerve damage.
- At risk:** Chickens, especially young birds (under 12 weeks old).
- Signs:** Paralysis of legs, wings, or neck; weight loss, uneven growth, tumors in organs, vision problems.
- Effects:** Highly contagious among birds; can cause death and permanent production losses.
- Notes:** Vaccinate chicks at hatchery or on day of hatching, isolate sick birds, and maintain good hygiene and biosecurity.

Fowl Pox

- Cause:** Viral infection affecting the skin.
- At risk:** Chickens and other poultry; all ages.
- Signs:** Wart-like nodules or scabs; lesions in mouth or throat.
- Effects:** Contagious among birds, can reduce productivity, and may lead to secondary infections.
- Notes:** Vaccinate in areas where the disease is common, isolate infected birds, control mosquitoes.

POULTRY HEALTH

1 Inspect birds daily:

Check appetite, feathers, eyes, droppings, and overall behavior. Watch for respiratory signs such as coughing, sneezing, or gasping for air, as these often indicate infections that spread quickly through a flock.

2 Check droppings regularly:

Watery, green, or bloody diarrhea can signal gut problems or serious diseases.

3 Look for weakness or paralysis:

Also look for weakness or paralysis, including birds that cannot walk properly, hold their heads tilted, or drag their wings.

4 Examine the skin and beak:

Examine the skin and beak for crusts or scabs, which may indicate pox or parasite irritation.

5 Sudden deaths:

Sudden deaths in the flock should be treated as an emergency and reported to a veterinarian.

6 Quarantine:

Quarantine new birds before introducing them to the flock.

7 Vaccinate:

Vaccinate according to local veterinary advice.

Poultry Health: Know the Signs, Prevent Early



Inspect birds daily. Check

- Appetite
- Feathers
- Eyes
- Droppings
- Overall behavior



Bright-eyed,
standing upright



Normal chicken
droppings



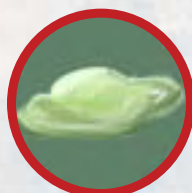
Vaccinated



Clean feathers



Drooping wings or
unable to walk



Watery/green/
bloody droppings



Scabs on beak/
skin



Coughing or
gasping



Sudden death –
report immediately



PRIORITY POULTRY DISEASES

- Newcastle disease (ND / Ranikhet)
- Infectious bursal disease (IBD / Gumboro)
- Marek's disease (MD)
- Fowl pox

PREVENTION STRATEGIES

- Inspect birds daily
- Sudden deaths = emergency
- Quarantine new birds
- Vaccinate
- Check droppings
- Examine the skin and beak
- Look for weakness or paralysis

Vaccination Schedule in Madhya Pradesh

A timely and complete vaccination schedule reduces disease outbreaks, improves survival and productivity, and should be followed for every animal on the farm.

GENERAL GUIDELINES

1 Vaccinate only healthy animals:

Sick, weak, feverish, or heavily parasitised animals respond poorly to vaccines.

2 Keep vaccines cold (2–8 °C):

Heat quickly destroys vaccine potency, so always store in a cool box and avoid sunlight. Use quickly after opening.

3 Use one vaccine at a time:

Do not mix vaccines or inject multiple vaccines in the same spot because this reduces effectiveness and increases reaction risk.

4 Let animals rest after vaccination:

Quiet conditions, shade, and water help the immune system respond properly.

5 Observe animals after vaccination for 30–60 minutes:

To notice signs of allergic reactions like swelling, difficulty breathing or collapse and react swiftly.

6 Keep records:

Note which animals were vaccinated, vaccine name, date, and next due date to maintain a reliable schedule.

✱ Vaccinate under the supervision and guidance of a registered veterinary practitioner. ✱

POULTRY (BACKYARD)

Disease	Vaccination schedule
Newcastle Disease (ND / Ranikhet)	Day 7 → Day 28 → every 3 months
Infectious Bursal Disease (IBD / Gumboro)	Day 14 to 16 → Day 24 to 28
Fowl Pox (Avian Pox)	At 6–8 weeks; wing-web method
Marek's Disease (MD)	Day 1; usually given at hatchery

GOAT / SHEEP

Disease	Vaccination schedule
Peste des Petits Ruminants (PPR / Goat Plague)	Start at 3 months → then every 3 years
Enterotoxaemia (ET / <i>Clostridium perfringens</i> Type D)	Start at 3 months → booster after 3–4 weeks → then yearly
Goat Pox / Sheep Pox (<i>Capripox</i> virus)	Start at 3 months → booster after 1 month → then yearly
Foot-and-Mouth Disease (FMD)	Start at 3 months → booster after 3–4 weeks → then every 6–12 months

CATTLE / BUFFALO

Disease	Vaccination schedule
Foot-and-Mouth Disease (FMD)	Start at 4 months → booster after 3–4 weeks → then every 6 months
Haemorrhagic Septicaemia (HS) + Black Quarter (BQ)	Every pre-monsoon (yearly); start with calves above 6 months
Trivalent: FMD + HS + BQ	Start at 4 months → booster after 3–4 weeks → then every 6 months
Brucellosis – <i>Brucella abortus</i> S19 vaccine (female calves)	Once in lifetime; at 4–8 months. Never give to pregnant or adult females. Use trained personnel only.
Anthrax (<i>Bacillus anthracis</i>)	Only if endemic; yearly in affected villages; start at 4 months and above. Use trained personnel only.

Vaccination Schedule in Madhya Pradesh

POULTRY (BACKYARD)

Disease	Vaccination schedule
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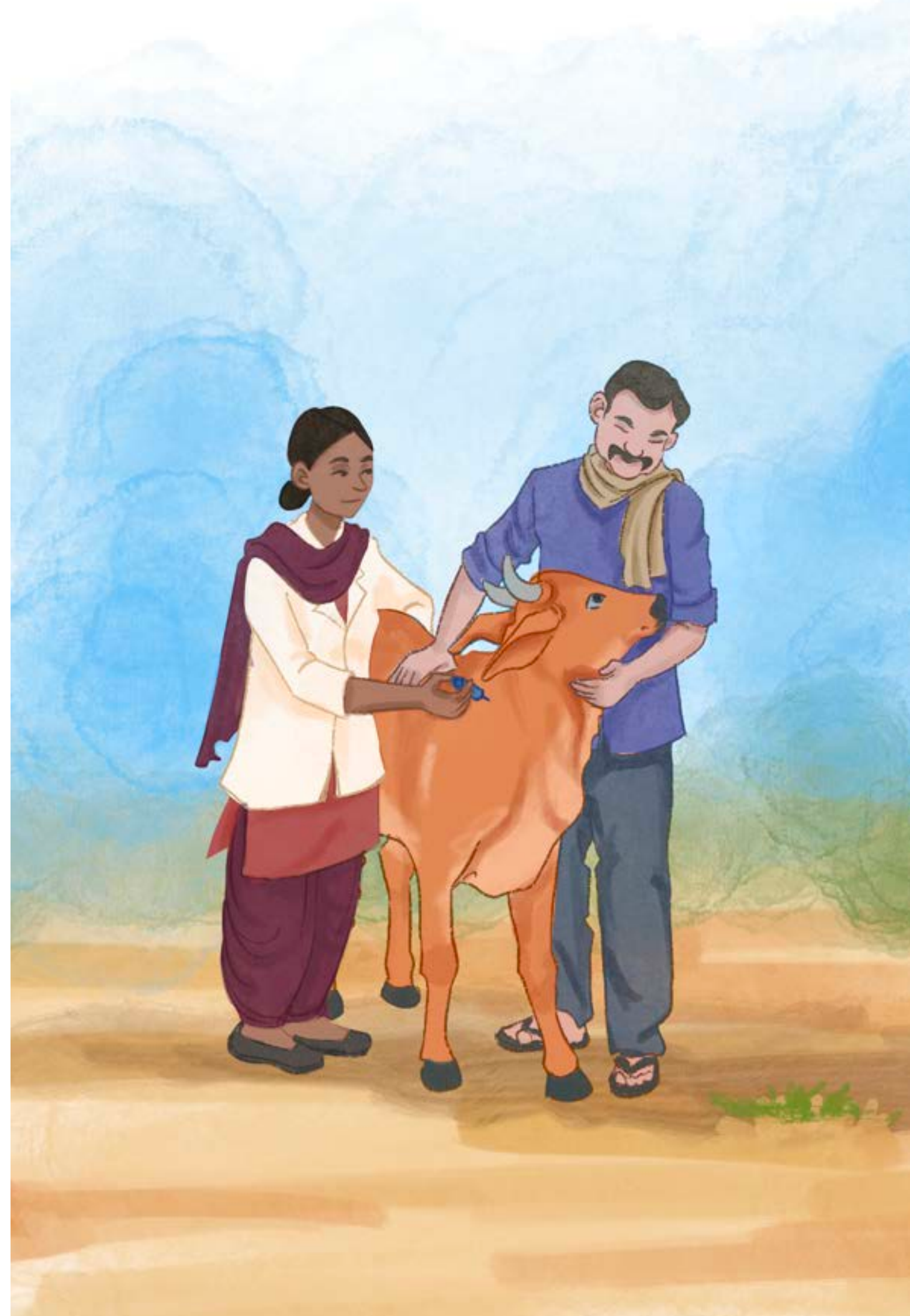
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ONE HEALTH AND AGROECOLOGY

One Health within the scope of Sustainable Livestock Management

MODULE 3: Animal Care and Management for Resilient Farms



Principles of Good Animal Husbandry

Good animal husbandry practices and management promote animal health, welfare, and steady production.

Even small, consistent improvements in how animals are housed, fed, handled, and monitored can greatly strengthen their ability to stay healthy and productive – and provide more milk, meat, and eggs, even under difficult conditions.

✱ Good animal management also reduces disease risks for people, animals, and the environment, supporting the One Health approach. ✱

Choosing robust breeds:

- Robust breeds are animals that can thrive under local conditions with fewer inputs. They may not always produce the absolute maximum amount of milk, meat, or eggs, but they are healthier, hardier, and more reliable in the long run.
- Cross-breeds are sometimes developed to combine the best of both worlds: they keep the resilience and adaptability of local breeds, while adding some of the higher productivity trait.

Housing and shelter:

- **Protection from extreme weather:** Shelters should protect animals from the intense summer heat, monsoon rains, and winter chills. Planting trees around sheds provides natural shade and reduces heat load.
- **Adequate space and ventilation:** Providing sufficient space in animal sheds improves air circulation, and thereby reduces heat stress, especially during hot summers and prevents respiratory issues. Simple, cross-ventilated structures with high roofs work effectively.
- **Proper flooring and bedding:** Use easily cleanable, comfortable flooring materials. Sand, dry straw, or paddy husk are affordable local options that help keep animals dry and reduce problems such as mastitis in dairy animals.

Stress management:

- **Gentle handling:** Manage animals calmly during routine procedures, transportation, and health check-ups.
- **Avoid overcrowding:** Overcrowding increases stress and encourages disease spread.

Monitoring:

- Good animal management is the foundation of sustainable livestock production.
- Make it a habit to check on your animals every day. Watch their behaviour, appetite, and manure; look over their body for wounds or anything unusual. Seek professional help in case you notice anything unusual.

Continuous learning and improvement:

- **Keep yourself informed** about current animal health issues, including local disease outbreaks, emerging threats, and updated treatment or prevention methods.
- **Regularly check** guidelines, improved husbandry practices, and advances in animal nutrition, welfare, and biosecurity.
- **Participate in ongoing training** to strengthen your technical skills, such as diagnosis, treatment, record-keeping, and safe handling of animals.
- **Share updated knowledge** with farmers and livestock keepers to help them adopt better husbandry and welfare practices.

Principles of Good Animal Husbandry

Housing & shelter

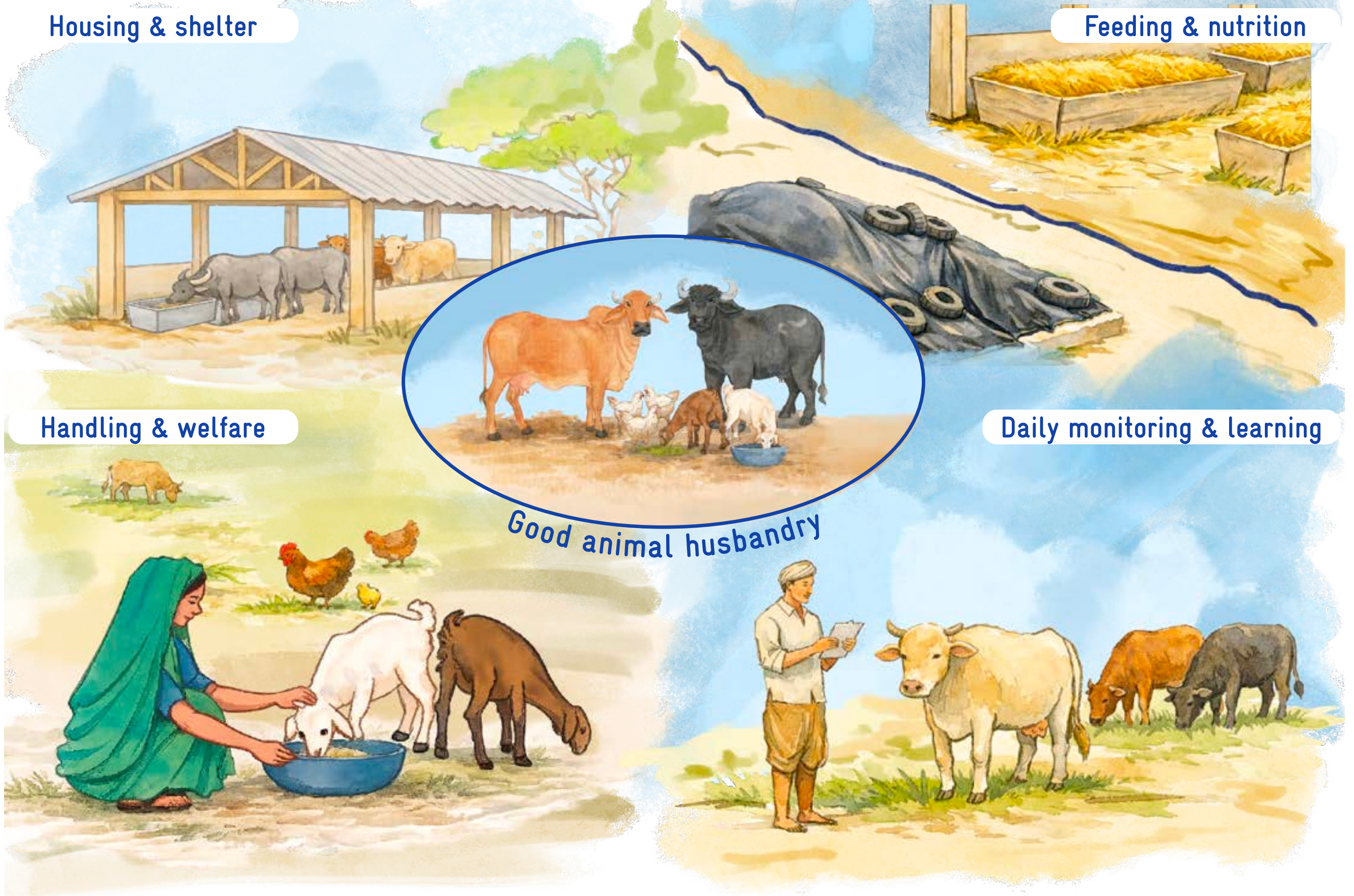
Feeding & nutrition

Handling & welfare

Daily monitoring & learning



Good animal husbandry



Parasite Control and Pasture Management

Good pasture management is the foundation of healthy and productive livestock. Well-managed pastures provide high-quality forage. Simple, low-cost practices can make a big difference: rotate grazing areas to allow grass to regrow, maintain adequate grass cover, reseed bare patches with local grasses or legumes, and enrich soil naturally using farmyard manure or compost. Providing clean water and simple shade or shelter keeps animals comfortable, while controlling weeds and keeping pastures tidy improves forage quality.

These practices also create conditions that naturally reduce the risk of diseases and parasites.

Parasites

Both internal and external parasites can harm animal health and decrease productivity.

Risks: Reduced milk, egg, or meat production; poor growth; weight loss; reduced fertility; and even death in young animals. Parasites can spread from one animal to another, and some, especially ticks, can also carry diseases that infect other animals and even humans.

● Internal (Endoparasites)

These include **worms** such as roundworms, tapeworms, and liver flukes that live inside the body.

Signs: Rough coat, enlarged belly, slow growth, loss of weight, weakness, sometimes watery discharge, intermittent diarrhea, pale gums, decreased productivity.

● External (Ectoparasites)

These include **ticks, lice, fleas, and mites** that affect the skin and coat

Signs: Intense scratching, hair loss, skin irritation, wounds, weakness, decreased productivity due to agitation, stress and less food intake.

INTEGRATED PARASITE MANAGEMENT

1 Seek advice:

Seek advice by an animal health professional on antiparasitic strategies, timings and products.

2 Treat strategically:

Treat strategically based on parasite load, species, age, and season; avoid overuse to prevent resistance. Parasites spread fastest in warm and humid weather (adjust management during that time).

3 Maintain records:

Maintain records of treatment dates and products used.

4 Keep sheds and pastures clean:

Keep sheds and pastures clean, collect animal feces promptly to prevent spread of endoparasites.

5 Compost manure properly:

Compost manure properly before using it on fields to kill parasite eggs and larvae. Store manure away from sheds, animals, and water sources to prevent recontamination and reduce disease risk.

6 Avoid grazing in wet or muddy areas:

Avoid grazing in wet or muddy areas, especially near ponds or during the rainy season, as risk of parasite infection is higher.

7 Protect young animals:

Protect young animals that are most vulnerable for worm infection. Older animals may have gained immunity by getting infections during their lifetime.

8 Use low-risk pastures for young animals:

Use low-risk pastures for young animals, such as rested and regrown areas previously used for hay or silage to minimize parasite exposure.

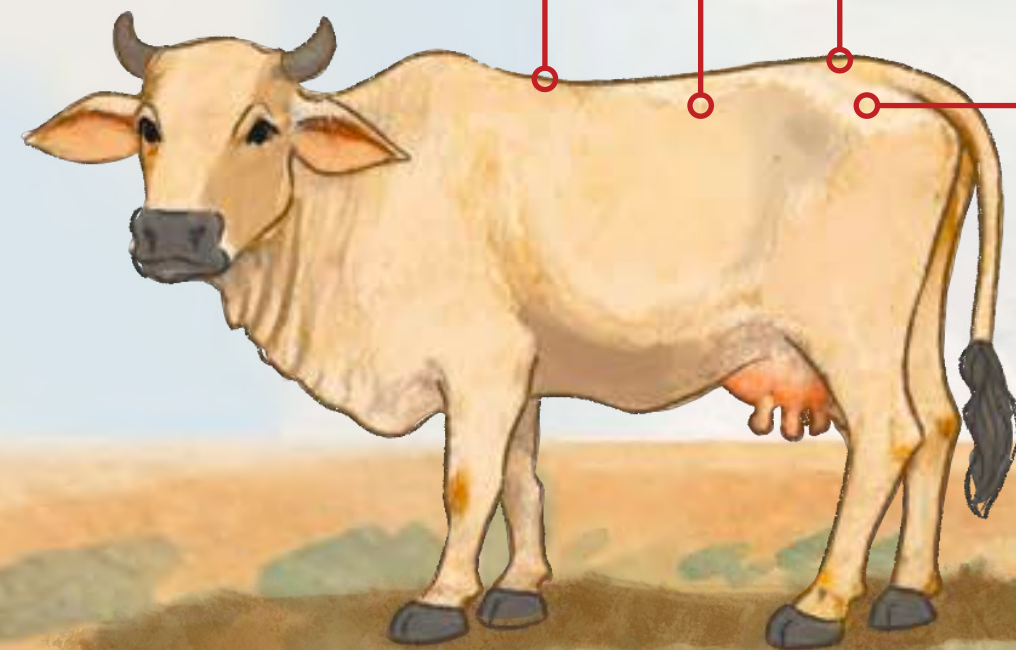
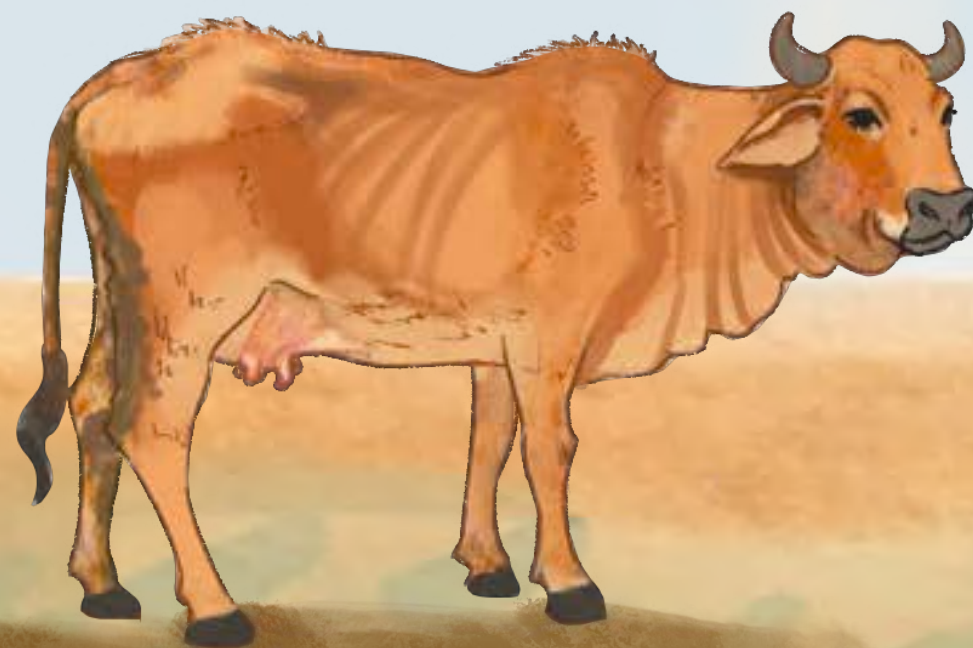
9 Ectoparasite management:

Regularly clean and inspect sheds, bedding, and equipment. Inspect animals daily for ticks, lice, or mites. Chicken can also help control pests by eating ticks and other insects, reducing parasite pressure in pastures.

10 Buy only licensed and trusted products:

Buy only licensed and trusted products to avoid fake or poor-quality antiparasitics.

Parasite Control and Pasture Management



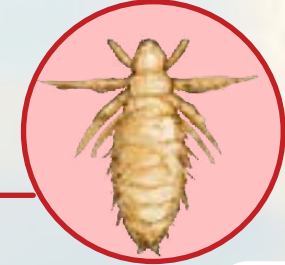
Fleas



Ticks



Lice



Mites



Parasites

- Internal (Endoparasites)
- External (Ectoparasites)

INTEGRATED PARASITE MANAGEMENT

- Seek advice
- Treat strategically
- Maintain records
- Keep sheds and pastures clean
- Compost manure properly
- Avoid grazing in wet or muddy areas
- Protect young animals
- Use low-risk pastures
- Ectoparasite management
- Buy only licensed and trusted products

Feeding and Fodder Practices for Resilience

Clean feeding practices, safe water, and reliable fodder supply are key to keeping animals healthy and productive.

Good feeding practices:

- Always offer clean, fresh and mold-free feed.
- Do not feed animals from the ground; use clean troughs.
- Clean troughs daily: scrub out slime, mud, or leftover feed.
- Avoid sudden changes in feed; introduce new fodder gradually to prevent digestive upsets.
- Do not keep more animals than you can feed properly – underfed animals are weak and unproductive.
- Store fodder dry, off the ground, and protected from rain, humidity, pests (like rats and mice), and wildlife.
- Never allow animals to eat garbage or plastics – cows and sheep are especially vulnerable to plastic blockages, which are fatal.

Clean water availability:

- Ensure access to clean, safe drinking water.
- Protect water sources: fence off wells, tanks, or ponds to keep them free from dung, mud, and urine.
- During the dry season, check water flow and ensure backup sources.

Fodder development:

- Promote cultivation of improved varieties of green fodder like berseem, lucerne, and hybrid napier, which can be grown effectively in climatic conditions of Madhya Pradesh.
- Promote fodder banks to store feed for lean periods, strengthening resilience during drought or erratic rainfall.

Silage and hay making:

- Practice silage and hay making to preserve green fodder for use during scarcity periods, especially in areas affected by erratic rainfall or drought.

Feeding and Fodder Practices for Resilience



Elements of a Balanced Diet

Healthy, productive animals depend on balanced diets that combine roughages, concentrates, and essential mineral supplements. Knowing the types of feeds available and how to use them safely helps ensure steady growth, strong immunity, and good production under local conditions.

TYPES OF LIVESTOCK FEEDS

Roughages:

Bulky feeds with high fiber (more than 18%) and lower digestibility; usually farm-grown.

- **Dry roughages:** hay and straw (wheat straw, soyabean straw, paddy straw).
- **Succulent roughages:** green fodder (e.g., pasture grass, cultivated grasses like maize, sorghum, berseem), silage and haylage (fermented feeds).

Concentrates:

Feeds with less fiber and high digestibility; often by-products of cash crops.

- **Energy-rich concentrates:** cereal grains (e.g., maize, jawar, bajra, oats, wheat); grain by-product (wheat bran, rice bran, rice polish, gram husk, broken gram or gram chuni); molasses and jaggery; fats (oil and ghee).
- **Protein-rich concentrates:** oil cakes (e.g., soybean meal, groundnut cake); animal-based protein meals (must not be used in cattle or other ruminants! E.g., fish meal, meat meal).

Supplements:

- **Mineral supplements:** e.g., limestone, common salt, mineral licks, eggshell (for chicken); essential for growth, bone strength, milk yield, and fertility; crucial in regions with low mineral soils that are common in Madhya Pradesh. Mineral mixtures are species-specific and should not be interchanged. Each animal type has different needs and tolerances for minerals like copper, selenium, iodine, calcium, and salt. Always use the mix formulated specifically for that species to avoid deficiencies or toxicity.
- **Vitamin supplements:** E.g., vitamin-mineral premixes; important during recovery, low-green-fodder periods, stress.
- **Additives:**
 - Growth promoters: Such products are unsafe, promote antimicrobial resistance, and their use as growth promoters or routine feed additives is forbidden in animals. Because labels might be unclear, avoid feeds with substances such as colistin, tetracyclines (e.g., doxycycline), neomycin, zinc bacitracin, flavomycin, or ionophores (e.g., monensin).
 - ✳ **Note:** Do not use any feed that contains antibiotic additives or other growth promoters. ✳
 - Safe additives include probiotics/yeast cultures, buffers (e.g., sodium bicarbonate), and toxin binders, which can improve digestion and safety without harming animals.

Elements of a Balanced Diet



Roughages



Concentrates



Mineral supplements



Vitamin supplements



No antibiotics
or other growth
promoters

Species-Specific Feeding: Ruminants (Cattle, Buffaloes, Goats & Sheep)

General daily feeding guidelines for cattle and buffalo:

- **Frequency:** feed three times a day, offering a mix of concentrates and roughages at each feeding, to maintain continuous rumen fermentation.
- **Water:** provide constant access to clean drinking water 25-50 liter per day (more in hot weather or during lactation).
- **Dry fodder:** approx. 6 kg.
- **Compound feed (concentrates):**
 - **For maintenance:** 1.5-2.0 kg for cows, 2.0-2.5 kg for buffaloes.
 - **For milk production:** 400 grams for cows or 500 grams for buffaloes per liter of milk.
 - **Pregnancy:** additional 2.0-2.5 kg in the last two months of pregnancy.

General feeding guidelines for goats and sheep:

- **Frequency:** feed three times a day, offering roughage at every feeding. Continuous access to fodder helps maintain good rumen function.
- **Water:** Provide constant access to clean drinking water 2-4 litres per day (more in hot weather or during lactation).
- **Dry fodder:** approx. 1-1.5 kg per adult animal per day (about 2-3% of body weight).
- **Green fodder / Grazing:** Allow 6-8 hours of daily grazing or provide 2-3 kg green fodder per adult if grazing is limited.
- **Compound feed (concentrates):** Use concentrates only when nutritional needs are higher and prevent overfeeding grains.
 - **Lactation:** 300-500 g/day, depending on milk yield.
 - **Pregnancy (last 6 weeks):** additional 250-350 g/day.
 - **Kids/Lambs:** Creep feed 150-250 g/day until weaning.

Breeding bulls,rams or bucks:

Provide a roughage-based diet of good-quality, supply minerals and salt, and offer only moderate concentrates so that the bull maintains sound legs, and good semen quality without becoming over-conditioned or fat.

*** Note: Do not give cattle mineral mixtures to sheep or goats, as some minerals, especially copper, are too high and can become toxic. ***

Pregnant and lactating animals:

Pregnant and lactating animals: require extra feed and minerals.

Young stock, growing animals:

A balanced mix of roughage and concentrate is needed to support steady growth without excess fat. After six months of age: give the same concentrate mixture as adults (with adjusted quantity).

Species-Specific Feeding: Ruminants (Cattle, Buffaloes, Goats & Sheep)

Basic needs and life stages



Newborn:
colostrum, milk



Calf: starter,
roughage



Growing: balanced
mix



Pregnant or lactating:
extra feed and minerals



Breeding bull: roughage based, moderate
concentrate

Simple guideline for composition of calf starter concentrate



50-60% grains



20-25% protein
sources



10-20% bran



5-10% molasses



2-3% mineral
mixture



0.5-1% salt



No antibiotics
or other growth
promoters

Species-Specific Feeding: Calves

FEEDING OF CALVES

1 Must receive colostrum (first milk):

Must receive colostrum (first milk) within the first hours of life as it protects against diseases (very important).

2 Continue milk feeding:

Continue milk feeding for the first 10–12 weeks, gradually reducing the quantity as the calf begins to eat more solid feed.

3 Introduce roughage:

Young calves can only digest milk during the first weeks; start introducing small amounts of soft, highly digestible roughage at 1–2 weeks to support rumen development. Increase quantities steadily after 6–12 weeks as milk is phased out.

4 Introduce calf starter (concentrate):

Introduce calf starter (concentrate) from the first week in very small amounts and increase gradually as intake improves; most calves reach 500–1000 g/day between 3 and 5 months.

5 Water:

Always give calves access to clean drinking water at all ages.

WHAT TO LOOK FOR IN A GOOD CALF STARTER (CONCENTRATE)

A good calf starter supports early rumen development and steady growth.

Feed quality:

Good quality is crucial for calves. The starter must be clean, dry, fresh, and free of mold or a musty smell. Use the mix within 3–4 weeks.

Energy sources:

Use easily digestible grains such as maize, barley, jowar, bajra, or wheat. These should make up about half of the mix (roughly 50–60% of weight).

Protein sources:

Include moderate amounts of good-quality protein such as groundnut cake, soybean meal, or gram. Keep total protein ingredients around 20–25% of weight of the mix. Avoid excessive oilcakes, which can cause digestive problems.

Fiber:

Some fiber is needed but not too much. Aim for a crude fiber level of 7–10% of weight. Wheat bran usually provides enough fiber without reducing digestibility.

Palatability:

Calves eat better when the starter is tasty. A small amount of molasses (5–10% of weight) improves intake and helps the mixture bind together. A slightly coarse texture is preferred over a fine powder.

Minerals and vitamins:

Include a mineral mixture (2–3% of weight) and common salt (0.5–1% of weight). A vitamin premix can be added when needed, e.g., during stress periods.

No antibiotics or harmful additives:

Calf starter should not contain antibiotics, urea, or non-protein nitrogen.

Species-Specific Feeding: Calves

Simple guideline for composition of calf starter concentrate



50–60% grains



20–25% protein
sources



10–20% bran



5–10% molasses



2–3% mineral
mixture



0.5–1% salt



No antibiotics as growth
promoters

Species-Specific Care: Poultry (Backyard Chickens)

Chickens kept under good management are more resistant to disease, produce more eggs and meat, and cope better with heat, rain, and other challenges.

1 Housing:

- A poultry house protects chickens from disease, harsh weather, predators, and thieves.
- Build poultry houses with materials that are easy to clean and disinfect, especially the floor, as cracks are hiding places for parasites.
- Provide perches for night comfort and easier manure collection. Treat perches with used engine oil or kerosene to deter parasites.
- Provide ash/sand baths to help control mites and lice naturally.
- Provide nests in quiet, dim areas. Equip nests with clean bedding (straw, husks, or sawdust) so eggs are laid in one place and remain clean.
- Replace bedding regularly to keep the poultry house clean and dry.
- Manure from poultry can be used in compost to fertilise fields.
- Use strong fencing or netting around chicken runs to keep out dogs, snakes, and other predators.
- Cover the top of runs with nets to protect from hawks and wild birds.
- Keep wildlife, especially other birds, away to reduce disease transmission.

2 Feeding practices:

- Keep drinkers and feeders clean. Never place them under perches or roosts.
- Use narrow-rimmed drinkers so birds cannot perch and contaminate water.

3 General feeding guidelines:

- **Baby chicks:** need protein-rich starter feed to grow strong and healthy. Keep feed fine and easy to eat.
- **Growers:** balanced feed with protein and minerals for steady growth.
- **Laying hens:** require energy-rich feed with added calcium and minerals to sustain egg production and strong shells. This can be done by adding eggshell to feed. However, first soak the eggshells in boiling water for about 45 minutes, then dry them, grind or pound them, and mix them into the feed.
- Feeding chicken only with concentrates could get very expensive. Planting **fodder plants** and feeding **kitchen leftovers** is a good option.

Species-Specific Care: Poultry (Backyard Chickens)



Feeding practices



Care for Weak, Injured, or Recovering Animals and the Use of Ethnoveterinary Practices

Animals recovering from conditions such as diarrhea, giving birth, wounds, or lameness require special care. Simple supportive measures help them return to full health more quickly.

1 Provide nursing care and support:

- Keep in mind that sick animals might struggle to move or walk, so ensure they have access to drinking water, nevertheless.
- Offer high-quality, palatable fodder and, where possible, energy-rich concentrates to promote recovery.
- Hand-feed or assist weak animals, if necessary.
- Monitor appetite, manure consistency, movement and wound healing.

2 Create a low-stress environment:

- Provide a quiet, comfortable space with adequate shade and shelter from harsh weather.
- Use clean, dry bedding.
- Minimise handling and noise.

3 Reduce competition and pressure from the herd:

- Keep recovering animals separate from stronger stock so they can rest, feed, and drink without being pushed aside.
- If possible, house them with calm companions or in small groups for comfort and security, but only when you are sure that they don't carry an infectious disease.

4 Hygiene and biosecurity:

- Remember hygiene around sick animals: wash hands after handling.
- Keep recovery pens separate, and safely dispose of manure, afterbirth, and dirty bedding to stop diseases from spreading.

5 Attend to wounds and injuries:

- Clean and dress wounds promptly to prevent infection.
- Keep injured areas dry and protected.
- Keep lame or injured animals in a dry, non-slippery area with good footing to prevent further injury and help them stand or walk more safely.

6 Role of local and plant-based practices:

- Local knowledge can play a valuable role in supporting animal health and productivity, especially for minor issues or early care. Many households use simple, plant-based remedies that can complement the work of animal health workers and veterinarians.
- Detailed information for some ethnoveterinary remedies can be found in the booklet "Ethnoveterinary Formulations for Important Ailments in Bovines" by National Dairy Development Board.

✱ Important reminder

While home-based remedies and self-treatment practices may provide support, they cannot replace professional care. Always seek advice from a trained animal health expert, especially in serious or prolonged cases for proper disease diagnosis and management. ✱

Care for Weak, Injured, or Recovering Animals and the Use of Ethnoveterinary Practices



Detailed information for some ethnoveterinary remedies can be found in the booklet “Ethnoveterinary Formulations for Important Ailments in Bovines” by National Dairy Development Board



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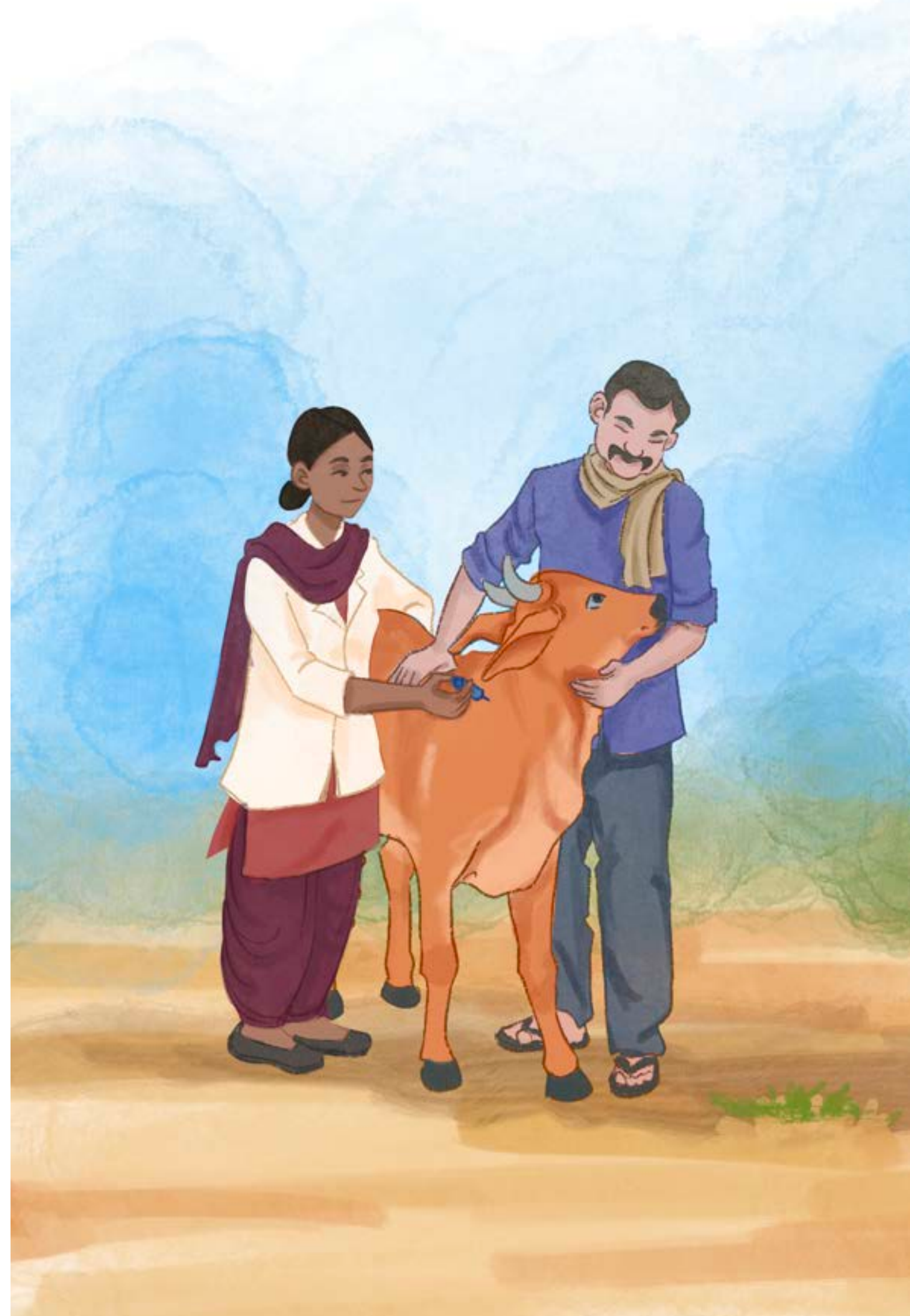
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ONE HEALTH AND AGROECOLOGY

One Health within the scope of Sustainable Livestock Management

MODULE 4: Judicious Use of Animal Medicines



Why is the Judicious Use of Animal Medicines Important?

RESPONSIBILITY MATTERS

Medicines like antibiotics and dewormers are needed in some cases for keeping livestock healthy and productive, but they must be used carefully. Their responsible use helps animals to get or stay healthy, while keeping food safe and the environment protected.

CONSEQUENCES OF WRONG USE

● **Animals still sick:** Wrong use such as wrong dose or timing can lead to prolonged sickness in animals.

● **Drug resistance (AMR):** Misuse can make germs resistant, so future treatments may not work well and could be more expensive. Resistant germs can spread to other animals or even humans.

● **Food safety:** Long-term intake of milk, meat, or eggs with drug residues can cause health issues in people who eat these.

● **Environment and soil fertility:** Medicine residues – whether from improper disposal of medicine packages, run-off from ectoparasite treatment or contaminated dung or urine – can damage soil bacteria, kill helpful organisms like earthworms and pollinators, reduce soil fertility, and harm aquatic life if it reaches water.

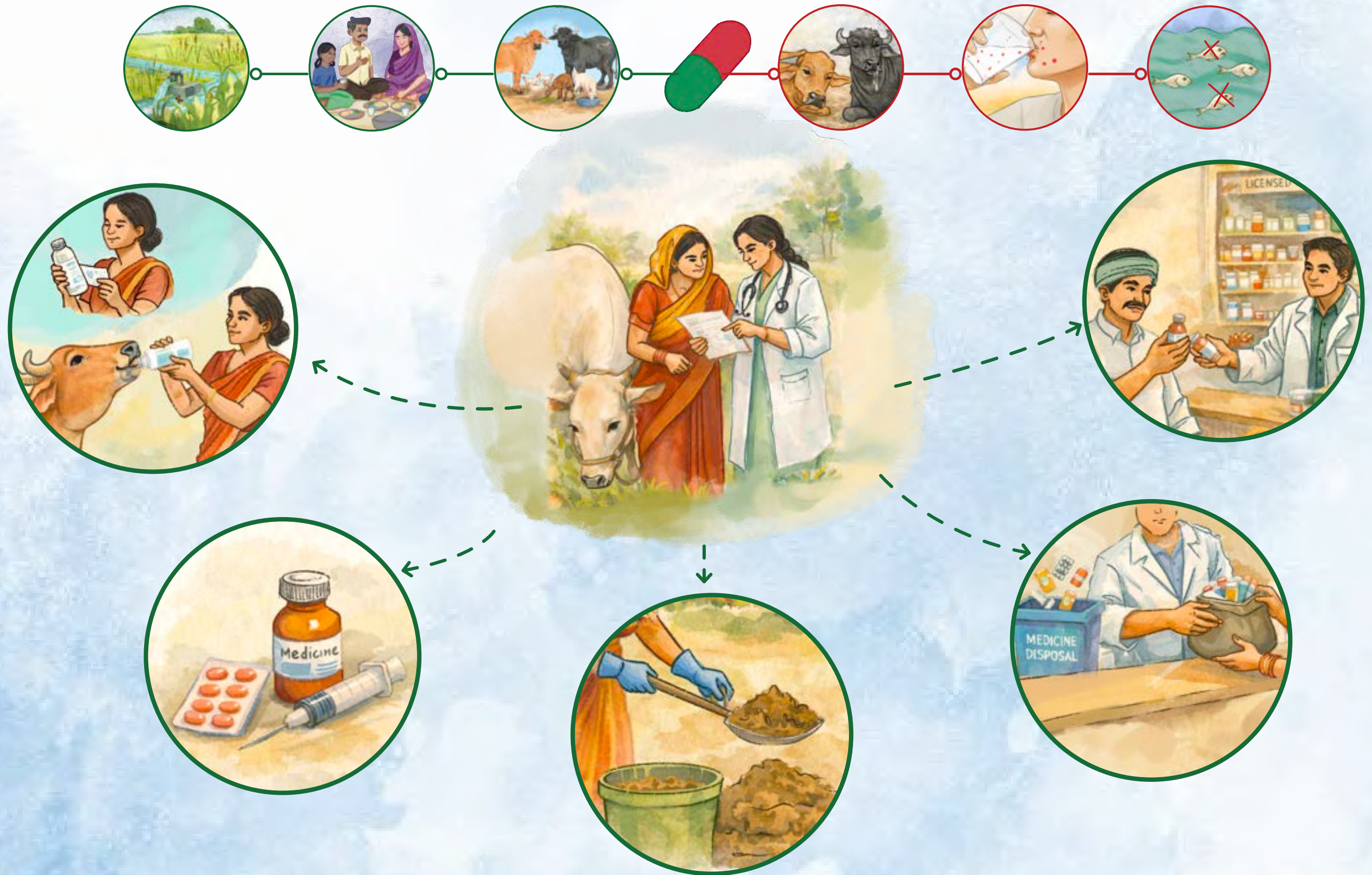
WHAT “JUDICIOUS USE” MEANS

- Give medicines only when necessary and follow a veterinarian’s guidance.
- Follow the instructions carefully including withdrawal period.
- Handle the medicines responsibly: store safely, keep labels intact, and buy animal medicines only from licensed pharmacies to avoid poor-quality or harmful products.
- Handle dung, urine, milk, eggs, meat of treated animals and leftover medicines carefully to avoid contamination and pollution.

LOOKING AHEAD

In the following chapters, you will learn more about these issues and practical ways to use medicines wisely, protect your animals and family, ensure safe food, and prevent pollution on your farm.

Why is the Judicious Use of Animal Medicines Important?



Judicious Use of Animal Medicines to Ensure Safe Food

HOW ANIMAL DRUGS MAY ENTER FOOD

- When animals are given medicine, like antibiotics or dewormers, their bodies absorb it and send it through the blood to where it is needed. The organs then break the medicine down, and the body removes it through urine, dung, or sometimes milk. This process is called metabolism and excretion.
- The removal process of medicines from an animal's body can take several hours to days, depending on the type of drug and its route of excretion. The time during which medicine residues may still be present in the animal's organs or products such as milk, eggs, or meat is called the withdrawal period.
- These medicine residues, metabolized, absorbed and excreted by the animal's body, may enter meat, eggs or milk and can make food unsafe for people to eat.
- Animal medicines can also enter products through external contamination. For example, topical medications applied on the udder may pass into milk if the area is not cleaned properly before milking. Or run-off from medicines like ectoparasite treatment that might transfer into food products during handling or processing.

HOW TO AVOID DRUG RESIDUES IN FOOD

- Avoid unnecessary treatments – less treatment, less need to manage it.
- Use food from your animals at a safe point in time (after withdrawal periods) or vice-versa. Avoid treatments close to when food products should be used (e.g. milking period, or a time close to slaughtering) and rather do treatments during the dry period.

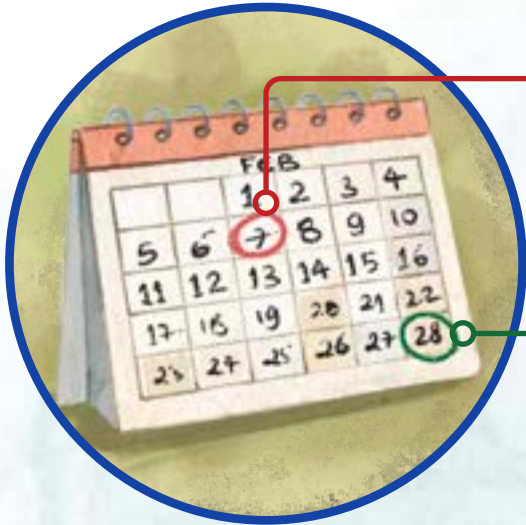
Keep track of treated animals

- **Mark the treated animal:** Use a tag, colour mark, or write down details to remember which animal is under treatment or withdrawal so you don't accidentally use their milk or meat.
- **Separate treated animals:** Keep animals that are still in the withdrawal period separate from the rest of the herd or flock.

IF CONTAMINATION CAN'T BE AVOIDED

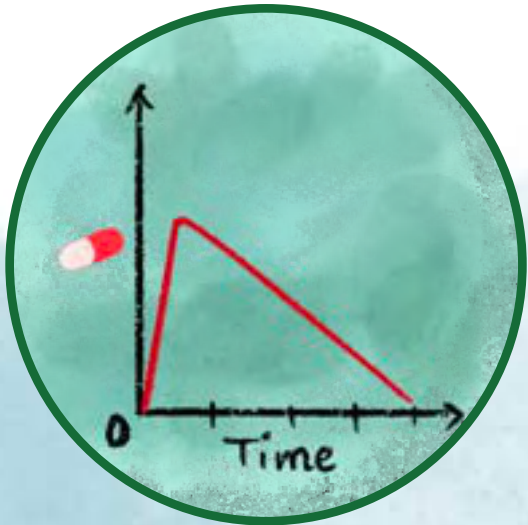
- Do not mix milk from treated animals with milk from untreated animals.
- Follow your veterinarian's advice for safe disposal of contaminated milk or eggs.

Judicious Use of Animal Medicines to Ensure Safe Food

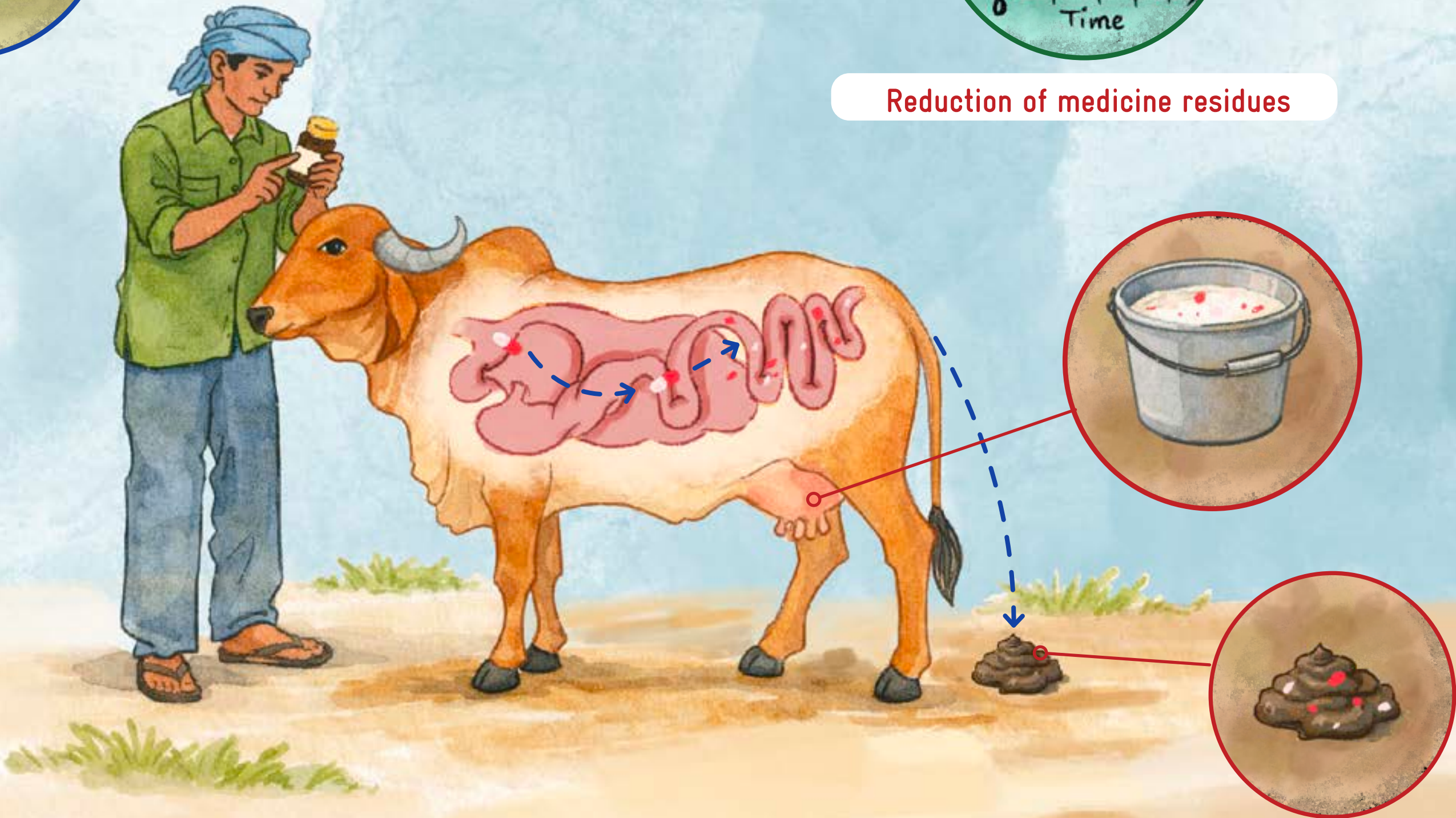


Day the medicine is administered

Safe for consumption



Reduction of medicine residues



Judicious Use of Animal Medicines to Avoid Antimicrobial Resistance / AMR

HOW AMR HAPPENS IN PRACTICE

Antimicrobial resistance (AMR) happens when bacteria, viruses, or parasites change over time and stop responding to medicines like antibiotics, dewormers or ectoparasitics. These practices allow resistant microbes to multiply, survive and spread, to other animals, humans, and the environment, making future infections much harder to treat.

WHAT CAN BE DONE TO AVOID AMR?

1 Maintain good hygiene and animal husbandry:

Prevent infections so less medicine is needed.

2 Avoid unnecessary use:

Don't give antimicrobials to healthy animals for disease prevention or growth promotion.

3 Check animal feeds:

Check for antibiotic content in animal feeds. Avoid using such feeds. Because labels might be unclear check for substances such as colistin, tetracyclines (e.g., doxycycline), neomycin, zinc bacitracin, flavomycin, or ionophores (e.g., monensin).

4 Consult a veterinarian:

Always get expert advice before using animal medicines and follow the instructions carefully.

5 Buy quality:

Buy animal medicines only from trusted sources and verified retailers to avoid substandard and falsified products.

6 Use appropriate animal medicines:

Only give medicines that are effective for the specific disease and animal species.

7 Follow correct dosage and treatment duration:

Never overdose, underdose or stop treatment early.

8 Follow withdrawal periods:

Wait for the prescribed time after treatment. Don't use milk, meat, or eggs for human consumption which might contain medicine residues.

9 Dispose safely:

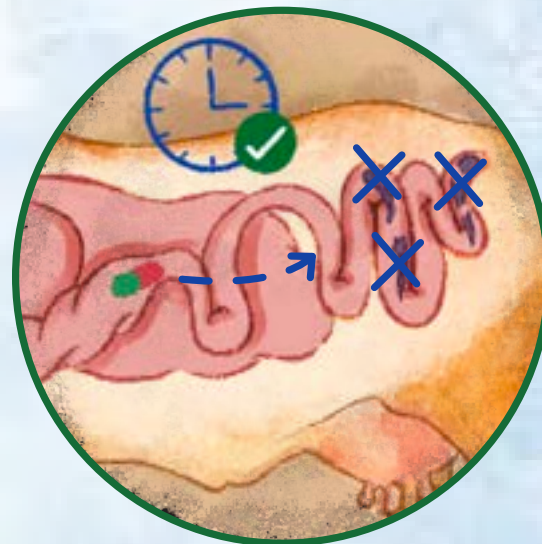
Never empty or dispose animal medicines into the environment.

HOW TO MAKE FOLLOW UP OF ANIMALS BEING TREATED EASY?

To make follow-up of treated animals easy and ensure judicious medicine use:

- **Mark treated animals clearly** – to identify animals during treatment.
- **Keep simple treatment records** – write in a notebook or wall chart the animal's ID, date of treatment, medicine name, dose, and withdrawal period.
- **Set reminders** – use a calendar or mobile phone alarm to track treatments and withdrawal periods.
- **Keep medicines safely labeled** – note expiry date and usage instructions to avoid confusion.

Judicious Use of Animal Medicines to Avoid Antimicrobial Resistance / AMR



WHAT CAN BE DONE TO AVOID AMR?

- Maintain good hygiene and animal husbandry
- Avoid unnecessary use
- Check animal feeds
- Consult a veterinarian

- Buy quality
- Use appropriate animal medicines
- Follow correct dosage and treatment duration
- Follow withdrawal periods
- Dispose safely

How Medicine Residues Reach and Harm the Environment

RESIDUES OF ANIMAL MEDICINE CAN REACH THE ENVIRONMENT THROUGH

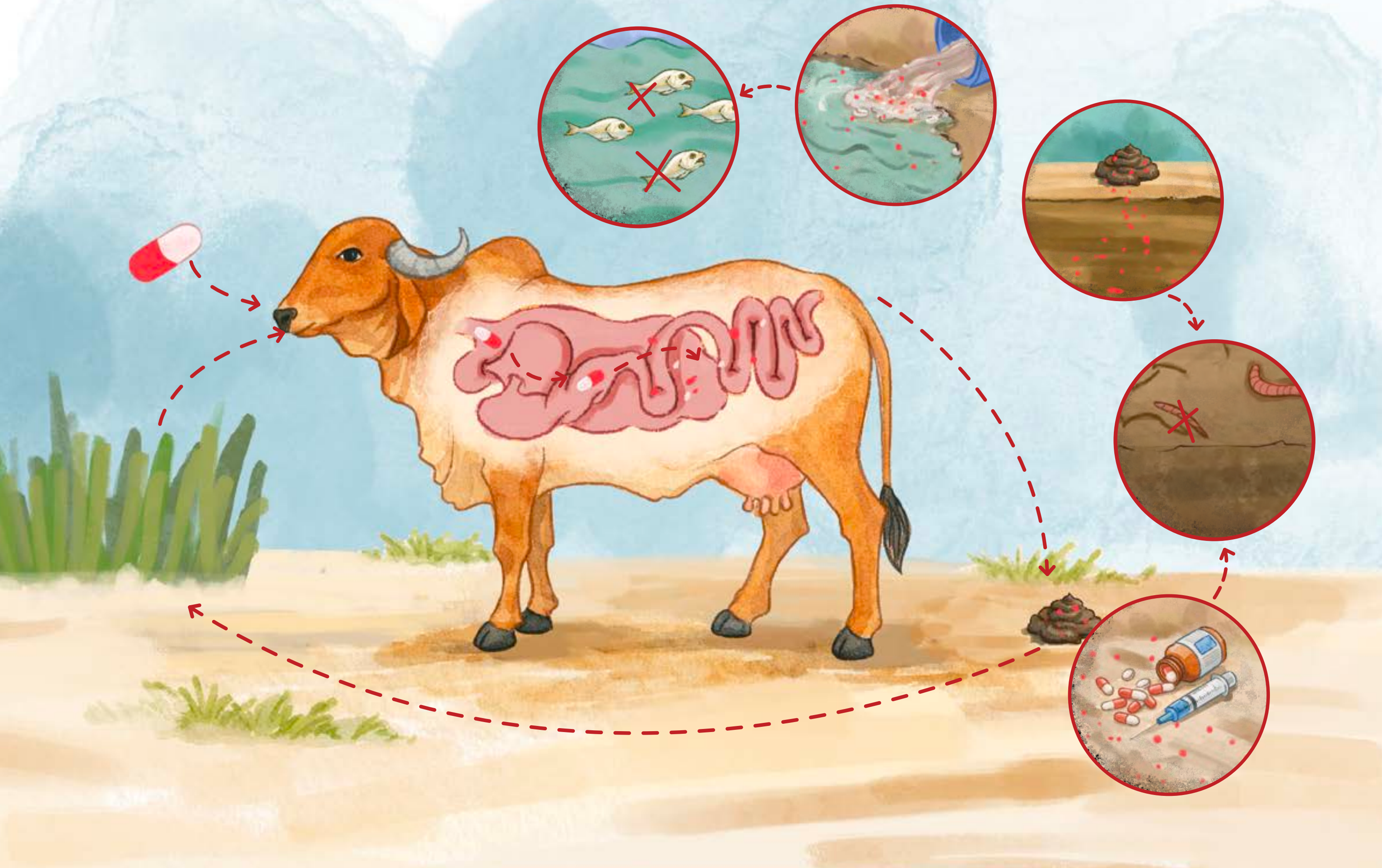
Animal waste and contaminated food products

- After use, many medicines are excreted in dung or urine. If this manure or urine is applied to fields or released into soil or water without proper treatment, drug residues can enter the environment.
- Beneficial organisms like earthworms and soil microbes can be harmed by residues. This reduces soil health and fertility.
- Pollinators and other beneficial insects can be harmed by residues e.g., from insecticides including ectoparasitic medicine.
- If residues reach water bodies, they may harm fish and aquatic life.
- Plants can absorb drug residues, these then can end up in animal fodder and the food chain. This cycle in the environment can lead to accumulation of residues and increases the negative impacts.
- Also, environmental pollution can lead to the spread of antimicrobial resistance through environmental bacteria and genes. When small amounts of antibiotics reach soil or water, the germs living there get used to the medicine and stop being affected by it. These "stronger" germs can spread to animals, people, and the farm environment. This makes common infections harder to treat in the future.

Improper disposal of (expired) medicines or contaminated materials

Throwing old medicines, syringes, or wash water from drug-mixing equipment into open drains, soil, or water bodies leads to direct environmental contamination. Therefore, old or expired animal medicine and pharmaceuticals should be returned to a veterinarian or collected at designated disposal points.

How Medicine Residues Reach and Harm the Environment



Measures to Avoid Entry of Animal Medicines Into the Environment

PRACTICAL STEPS TO PREVENT ANIMAL MEDICINE RESIDUES FROM ENTERING THE ENVIRONMENT

To prevent animal medicine residues from entering the environment, farmers can take the following practical steps:

- **Separate treated animals** and keep them in a designated shed so that their waste can be easily managed.
- **Collect manure from treated animals separately** and avoid applying it directly to crops, especially during the withdrawal period.
- **Keep treated animals away from ponds, streams, and open grazing areas** during the withdrawal period to prevent direct contamination of soil and water.
- **Manage contaminated dung carefully:** Dung produced during the withdrawal period can be collected separately and later used to make dung cakes for fuel. Wear protective gloves when handling such dung, burn dung cakes in open or well-ventilated areas, and avoid using the ashes near vegetables or drinking water sources. Burning likely reduces many residues, but not enough research exists to assume ashes are harmless.
- **Maintain good hygiene:** Workers should wash their hands thoroughly with soap and water after handling dung, tools, or storage containers.
- **Treat manure before using it on fields,** as this significantly reduces medicine residues.
Options include:
 - **Composting.**
 - **Anaerobic digestion** in a biogas system.
 - **Storing manure** for a sufficient holding period, allowing natural degradation of residues over time.

PRACTICAL COMPOSTING TIPS

1 Make a good compost pile:

Mix dung with dry materials such as straw, crop residues, leaves. This increases air flow and supports the heating process.

2 Ensure the pile stays hot:

A healthy compost pile should heat up in the center; you should be able to feel the warmth.

3 Turn the compost regularly:

Turning the pile every 1–2 weeks adds oxygen, keeps the temperature higher, and speeds up decomposition.

4 Keep the compost moist, not wet:

It should feel like a squeezed-out sponge.

5 Keep the pile covered:

Cover with a tarp or roof to protect from rain, prevent leaching and to help keep a stable temperature.

6 Compost for enough time:

Let the compost age for at least 3–4 months, or longer in cold seasons, to allow better degradation.

7 Keep compost away from water bodies:

Build compost heaps at least 10–15 meters from wells, ponds, or streams to prevent contaminants from washing into water sources.

8 Use finished compost safely:

Finished compost should look dark, crumbly, and smell earthy. Apply it to fields by incorporating it into the soil, which further reduces runoff.

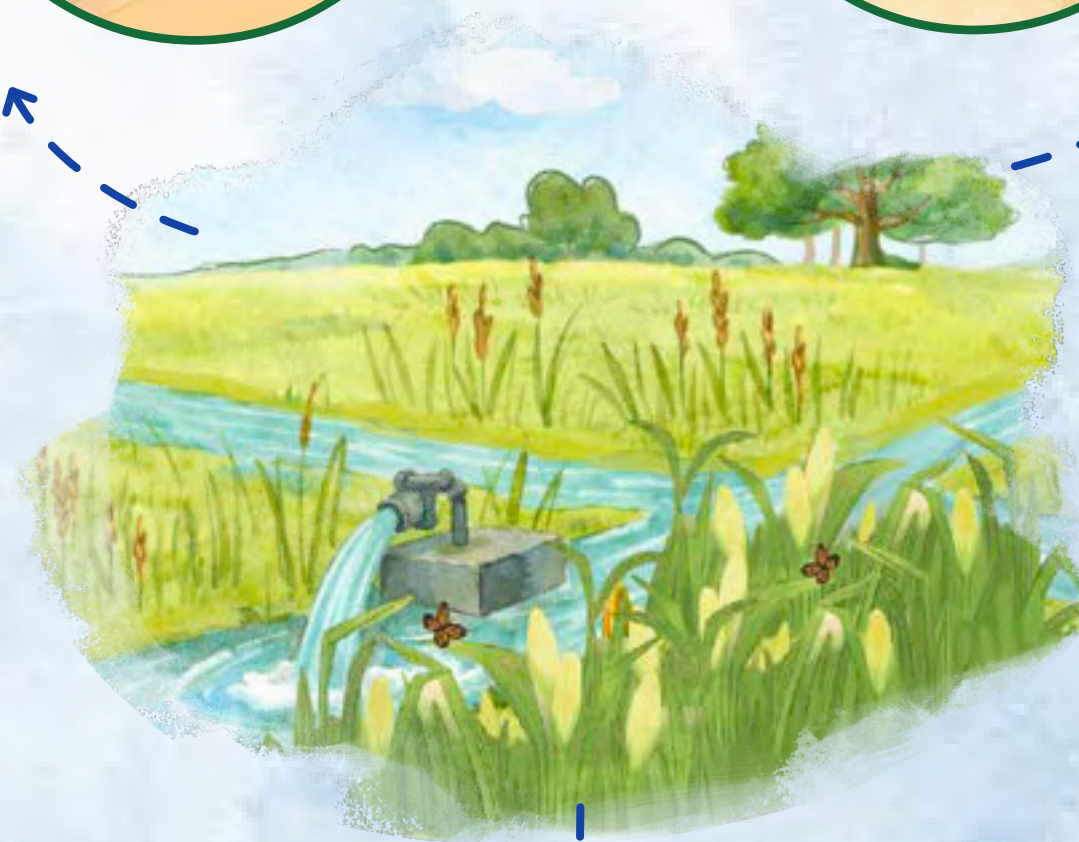
✱ While composting and other treatments can significantly reduce medicine residues, they do not remove all substances completely. Following the above-mentioned precautions still plays a critical role in reducing the risk of medicine residues entering the environment and food chain. ✱

Measures to Avoid Entry of Animal Medicines Into the Environment

Manure management, composting



Managing treated animals



Medicine and waste handling

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