

Training Paravets

A manual



Myrada Krishi Vigyan Kendra



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Training Paravets: A Manual

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Training Paravets

- a manual



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Foreword

Agriculture and Animal Husbandry are twin occupation practiced by the rural households since ancient times. Seventy percent of Indian populations are dependent for their livelihood on these activities, which form the backbone of the rural economy. Animal husbandry sector significantly contributes in supplementing family income and in generating gainful employment in the rural sector. The small and marginal farmers who constitute 67 % of the farming community hold the 70% of total livestock in the country.

India has the highest livestock population and largest milk producer in the world. Though high yielding cross breeds and latest technologies are available in livestock sector, these amenities do not reach the farmers of remote village in the time they are in need.

Lack of veterinary services in remote villages and poor livelihood status of small and marginal farmers has incited the KVK to evolve Para-veterinary promoters. As livestock enterprise is the major source of income to the small and marginal farmer's family, the health and AI services have been provided by the Paravets (Private veterinary service providers). There is good network of paravets with the public as well as private sector and institutions for extending Veterinary services. Only animal health diagnosis through some test, major surgery as well as livestock disease eradication campaign is being taken care by the Animal Husbandry departments.

MYRADA KRISHI VIGYAN KENDRA of Erode District has been conducting the Animal Heath Promoters training for the past 12 years and has developed paravets who are providing veterinary services all over the district. I am pleased to note that this training manual is produced by the outcome of the experiences of MKVK. This training manual will be very well utilized by the extension functionaries and other Institutions to train Paravets in their locations. I take pleasure in congratulating the enthusiastic team of MYRADA KRISHI VIGYAN KENDRA in developing this training Manual.

Dr. S.Prabhukumar,
Zonal Project Director,
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Preface

Training Paravets: A Manual

Livestock, both small and large, make up a large part of people’s livelihoods in rural areas. Agriculture and animal husbandry are considered twin occupations and nearly 50% of the poor, many of whom are landless, and livestock keepers. Animals keep the soil alive in farms, provide emergency cash for families and offer them companionship. In climatically marginal environments like mountain areas and arid zones, where farming is not feasible, it is livestock that keep families going. Erode district in Tamilnadu, where the Myrada Krishi Vigyan Kendra (MKVK) works, is no different; in the remote hills and dry plains of the district, most farm families own between 5-10 small ruminants and 2-3 milch cows; among those poorer, the numbers are still smaller. It was inevitable that to improve the lives of people, those of their animals had to be bettered. It has been a long and difficult, but fulfilling journey. In 1980, Myrada started initiatives to improve the quality of livestock, especially in the hills of Erode (then called Periyar district), like crossbreeding programmes, fodder promotion, vaccinations and starting cooperatives for milk collection and marketing. The results were extremely encouraging, but MYRADA KVK soon realised that they could not be sustained without the constant support of a veterinary service infrastructure. But the area was difficult – small populations isolated within reserve forests, no roads and no vehicles, wild animals and even Veerappan, the sandalwood smuggler. There was one veterinarian for every 20,000 ruminants in Erode division. Even if they wanted to, veterinarians could not cover the area that stretched across 200 km of Erode’s forests. A sustainable alternative had to be worked out.

Discussions between MKVK and local livestock holders threw up many ideas – but the most feasible one required the presence of trained para-veterinary workers in clusters of villages. There were many young men and women who had basic high school education and were willing to provide practical veterinary services in their villages; local self-help groups wanted to support such youngsters. Interestingly, two objectives could be achieved with this programme – create Paravets and jobs for young people locally. Thus a course was piloted in 1997. The year-long course was eventually converted to an intensive and focussed six-month programme. Six batches of young people have been trained as Paravets (called Animal Health Promoters locally)

Batches	Trained	Practising full time	Practising part time	Not practising
6	51 (11 female)	35 (7 female)	10 (1 female)	6 (3 female)

The Paravets typically work in 5-10 villages that are easily accessible by bicycle – but extend their services to around 30 villages once they own a motorcycle. Their services are usually related to first aid for injuries digestive problems, deworming, vaccination, castration and artificial insemination. Their clients are mostly small holders, but some Paravets have gained experience in providing intensive livestock health care to enterprises like dairies and poultry farms. They refer cases with complications to the nearest veterinary dispensary and thanks to mobile phones this is becoming easier. The focus is on preventive measures and extension for production management rather than treatment. The Paravets function independent of Myrada, but are invited for advanced training or as resource persons for camps, training programmes on livestock management and technology transfer projects of the MKVK. They network with local community based organisations, departments, NGOs, private firms and the milk cooperatives in the course of their work.



Why this manual?

Veterinary science is a vast discipline and its scope widens to include traditional knowledge and healing methods. The Paravet Training Programme has had to balance between providing adequate theoretical inputs and enhancing skills in practical aspects of livestock management. The participants were mostly teenagers out of high school – designing suitable classroom content that included veterinary medicine, management, participatory development and personality development was a tough call. Six batches later, we are reasonably confident about the basic contents of the course. After years of studying the programme, ICAR’s Zonal Project Directorate felt that a manual for training Paravets could have a larger audience and suggested that other Krishi Vigyan Kendras could start similar programmes. However, our programme is delivered in Tamil and in collaboration with other agencies. The course was only partly available in loose sheets of paper as notes and handouts; much was tacit knowledge of our trainers. The beginnings of this manual simply consisted to putting available material together. Many questions remained.

- Would the KVK system accept paravets - ‘non-professionals’ to deal with living beings? Pragmatic voices in ICAR supported the idea because they understood the sheer scale of reaching veterinary care to every corner of the country.
- Where do we draw the line between what a Paravet can or cannot do? This is a grey area and but we can say that Paravets can provide first aid to sick animals, vaccination, deworming, castration and when trained further, AI too. The Paravet is not trained to treat complicated cases, prescribe drugs or conduct surgery. The best bet is to train the participants very well in primary health care for animals, make them conceptually sound, gain mastery over simple nursing skills and create a professional attitude. The bottom line – we have received very positive feedback about Paravets from the community, and even more encouraging – the AH department feels that Paravets complement their work.
- Can MKVK run this programme? MKVK’s advantage is the constant presence of a veterinarian in its rolls. However, we realised that unless other institutions collaborated strongly, the Paravet Training Programme would be incomplete and expensive. Three other institutions act as pillars of the programme – the Tamilnadu State Department of Animal Husbandry and Veterinary Sciences, which officially recognised and supported the programme, the Erode District Cooperative Milk Union which hosts the trainees for their practical training, and Ambedkar Self-Employment Training Institute – which provides 15-30 days of training in entrepreneurship and technical skills. Additionally, the Veterinary University Training and Research Centre at Erode and the Tamil Nadu Livestock Development Agency extend support for training on Artificial Insemination. Most important, the strong presence of community based organisations in Erode has helped to anchor the programme in the rural communities.

The trainer using this manual has to be a qualified veterinarian. The content includes theoretical aspects with notes on what should be covered in practical sessions. A more detailed section on the course and how to use the manual follows. While we do not claim this is to be the perfect manual, it is indeed a sincere effort to share our experience widely. The manual took two years to develop as an in-house effort – anchored by Dr. Alamelu and supported by colleagues in Myrada and MKVK. We are glad it happened – we have possibly spent more time critically understanding our programme now than before. The manual may be useful for members of the KVK system, the biggest extension network in this country and for other agencies interested in similar initiatives. We would appreciate your feedback – because it would improve our programme. When you contextualise the material and translate it, when batches of young men and women with little metal boxes with blue crosses on them step out of your institutions and work with animals and their owners, we will consider our effort worthwhile.

P. Alagesan

Programme Coordinator, Myrada KVK

Acknowledgements

Myrada Krishi Vigyan Kendra is a partnership between Myrada (an NGO) and the Indian Council of Agricultural Research (Government of India). MKVK's Paravet Training Programme is a reflection of that partnership – a unique combination of Myrada's commitment to the poor and to using participatory approaches in training and the technical knowledge made possible through ICAR's support.

It is our duty to thank our host organisation Myrada, for supporting the MKVK with encouragement, funds and the freedom to innovate. In particular we are grateful to Sri Aloysius P Fernandez, Member Secretary, Sri S.S. Meenakshisundaram, Executive Vice Chairman and Sri Arvind G Risbud, Executive Director of Myrada who have been encouraging our activities. With her constant questioning of our motives and methods and with practical suggestions and encouragement Ms. Vidya Ramachandran, Member of the MKVK Trust and formerly our Programme Officer, has strengthened both the Paravet Training Programme and this Manual.

Our sincere gratitude goes to Dr. K.D. Kokate, DDG (Agri. Extension) of ICAR New Delhi for their continued support to MKVK. ICAR has always found time to see, examine and understand the essence of the Animal Health Promoters' programme. ICAR recognised the programme's merits early, defended it and enabled us to share this experience with the wider KVK network. Allowing us the use of its funds to run the programme was a sure sign of its commitment. In particular we would like to thank Dr. P Das, DDG (Extn.) (retd.) and Dr. S Prabhu Kumar, Zonal Project Director in Bangalore who first mooted the idea of the manual.

The Commissioner and Director of Animal Husbandry and Veterinary Services, Chennai, The Regional Joint Director of AH, Erode, and The Veterinary Assistant Surgeons in Erode have supported the project whole heartedly and personally took responsibility to mentor the trainees on the job. We owe a debt of gratitude to them all.

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We thank Saleela Patkar, who helped with the editing, research and designing of the manual, Anurag KR for illustrations, staff of Myrada Talavadi-Germalam Project and Myrada KVK in Erode in implementation of the programme.

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Contents

Foreword

Preface

Acknowledgements

Contributors to the manual

Contents

About the course

How to use the manual

Module 1: Animals and our life

Module 2: Breeds of livestock and poultry

Module 3: The animal body

Module 4: Hygienic animal care

Module 5: Feeding animals

Module 6: Oestrus cycle

Module 7: Artificial insemination

Module 8: Animal diseases

Module 9: Administering medicines

Module 10: Traditional treatments

Module 11: Rearing small animals and poultry

Module 12: Extension

Module 13: PRA

Module 14: Building relations and networks

Module 15: Technical linkages

Module 16: Animal health camps

Module 17: Preparing for the future

Resources

about the course



The Paravet Training Programme

The Paravet Training Programme has twin objectives - to create skills for animal health promotion and livestock development and to create employment opportunities for educated youth in local areas. While young people in Erode are more likely to pursue higher education these days, highschool educated teenagers from landless families often migrate to urban areas looking for manual jobs. MKVK has worked out the course objectives and eligibility criteria for the Vocational Training on Animal Health Promotion, as the Paravet training is called, to make the process relevant to such youth of any gender and for those who wish to remain in their villages.

Course objectives)

The Paravet Training Programme has two aspects to the course; a technical aspect which seeks to build knowledge and skills in paraveterinary practice and an extension and entrepreneurial aspect which seeks to develop entrepreneurs among Paravets. Paravets become professionals with thorough knowledge and practice of skills in animal health care. However, without the confidence to set up a paravet practice in their villages, they may become dependent on the MKVK for sustaining their livelihoods. Besides many believe that poor and small livestock holders may be unwilling to pay for the services of a Paravet even though the government veterinary service in the area is overstretched and unable to cater to their needs. The sustainability of the initiative therefore requires a strong component on managing the paravet practice as an enterprise.

Knowledge competencies:

These are written as objectively measurable behavioural indicators - that can be assessed through the weekly tests administered throughout the course.

Skills Competencies:

These are actions that participants must demonstrate practically either in the classroom or in the field - through direct observation, handling and examination of live or dead animals - taking due care for safety and occupational health precautions.

For a more detailed method of defining learning objectives for Paravet training, look up the following link:

<http://www.spc.int/rahs/Projects/Paravet3E.htm>

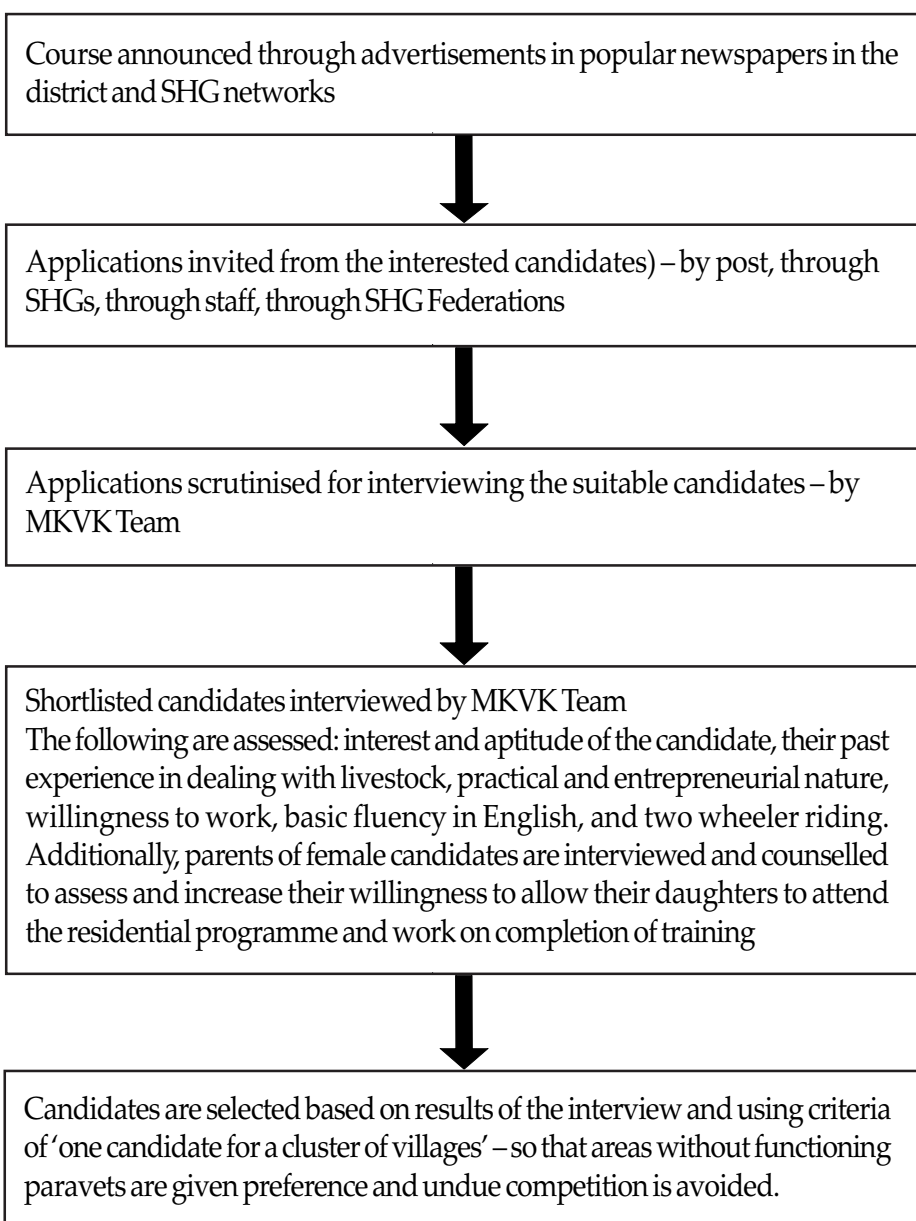
Who is eligible for the programme?

Prospective candidates for the Paravet Training Programme should come from rural areas and have at least attempted matriculation, though there have been graduates of even arts streams who have taken part. The candidates should be physically fit – as they would be dealing with large farm animals like cattle. Ability to ride bicycles or motorcycles is an added but optional condition. Candidates of the MKVK should be fluent in Tamil and should have basic knowledge of English. The age range of participants has been between 16 and 28 years.



Selection and admissions process

The process of admitting candidates into the course takes around two months from the announcement of the programme. This is made possible by the strong network of people's organisations - like self-help groups and watershed management associations, their federations and Community Managed Resource Centres. These people's organisations not only help identify deserving candidates, they give preference to those from poor and vulnerable families and women. They also help in filling up and forwarding application forms and CVs to MKVK.



The Course Schedule

The MKVK has scheduled modules in different ways in the six courses it has conducted so far. As the programme is held in collaboration with three other agencies, the scheduling also has to consider when the partner institutions have time and space available for the trainees. An indicative schedule is shown below.

Schedule	Topics
Week 1	Classroom Induction Programme for Participants About the training organisation Introduction to the Programme Module 1: Animals and our life Module 2: Breeds of livestock and poultry Module 3: The animal body Practicals Parts of animals End of week tests on Modules 1, 2 and 3
Week 2	Classroom Module 4: Hygienic animal care Module 5: Feeding animals Practicals Handling animals, care of cattle and ruminants, ration formulation, hay making, ensiling End of week tests on Modules 4 and 5
Week 3	Classroom Module 6: Oestrus cycle Module 7: Artificial insemination Practicals Identifying symptoms of heat in cattle and small ruminants AI Demonstration End of week tests on Modules 6 and 7
Week 4	Classroom Training cum exposure visit (ASETI) Dairy Management Entrepreneurship Development Programme (EDP) Practicals TNAU, RK Dairy farm, End of week tests on EDP Modules

Note: This is flexible and scheduled according to ASETI's convenience

Continued...



Schedule	Topics
Week5	Classroom Module 8: Animal diseases Module 9: Administering medicines Module 10: Traditional treatments Practicals Deworming and first aid, camps for disease identification and herbal treatment End of week tests on Modules 8, 9 and 10
Week6	Classroom Module 11: Rearing small animals and poultry Practicals Visits to farms to see animal rearing of different scales End of week test on Module 11
Week7	Classroom Module 12: Extension Module 13: PRA Module 14: Building relations and networks Module 15: Technical linkages Recap of entire course Practicals Participants conduct an informal study on livestock keeping in their native villages End of week tests on Modules 12, 13, 14 and 15
Week8	Classroom Module 16: Animal health camps Module 17: Preparing for the future Practicals One-day PRA exercise at a selected village End of week test on Module 16
Weeks 9-16 or two months	Internship with Department of Animal Husbandry and Veterinary Sciences: Two trainees are allotted per Veterinary Assistant Surgeon - VAS. Based in Veterinary dispensaries, trainees learn first aid, deworming, vaccination and treatment of minor Ailemets under the VAS. VASs submit feedback about each trainee in a feedback and evaluation meeting.
Weeks 17-24 or two months	Internship with Aavin (Erode District Milk Union) and attached to Aavin's doctors on their daily route. Learn first aid, deworming, artificial insemination, vaccination and other treatments for animals. Feedback and evaluation meeting with Aavin officials
End of Week 24	End of course test covering entire syllabus. Detailed report of the Course by participants with their feedback. Open session to clarify doubts, provide individual feedback and career counselling Graduation Day - Field day and camp during which course completion certificates and first aid kits are issued to participants

Regular classroom activities during the course

Every participant is provided notebooks and records and is expected to make detailed notes during classroom sessions and field visits. Since candidates come from resource poor schools in remote areas, note taking abilities and interest may be low in the beginning. Therefore, about 5 participants are grouped together and these groups are expected to jointly write one neat notebook or record after class hours in the evening. The trainer checks this record every morning and provides detailed feedback on the content, neatness and promptness of transcribing the learning into record books. Similarly, during their internships with other institutions (like the Dairy or Veterinary Clinics) every participant is expected to maintain a daily diary on interesting cases seen, animals examined, symptoms and diagnosis. Candidates do not pass or fail the course. Their aptitudes and pace of learning differ. All candidates are given enough opportunities to practice their skills and understand concepts. The end of the week tests help in assessing learning immediately so that corrective steps can be taken soon. Learning in groups is also encouraged.

Visioning and Entrepreneurship Development

Towards the latter half of the course, all participants undergo a visioning exercise, to develop their personal goals and an action plan. They are also enabled to identify villages where they would like to operate (centred around their own village). The Entrepreneurship Development Programme conducted both by ASETI and MKVK's trainers helps in this regard.

Certification

At the end of the course a field day is organised and all candidates who have completed the course receive a certificate from the MKVK. They are also gifted a veterinary starter kit consisting of a sturdy box or bag with a first aid kit and a Burdizzo's castrator.

Continuing Education

All professionals need to learn on a continuing basis, to retain and to enhance skills and knowledge. The MKVK has regular refresher courses for alumni of the course. Every year, participants are invited to a two day programme which includes refresher content as well as new topics and skills. Alumni are also informed about programmes that are conducted by other agencies. E.g. there are 4 month long training programmes on Artificial Insemination, the VUTRC has a course on sheep rearing, NGOs conduct training on herbal treatment, the department conducts training on AI for small ruminants, dairy management, fodder promotion, etc. The costs of these programmes are borne by the trainees themselves, though they are often subsidised or free of cost.

Ambedkar Self-Employment Training Institute Content of the One Week Training and Exposure for the Paravet Training Programme	
Technical Subjects: Calf rearing Fodder development Cattle management Commercial dairy management Prevention of cattle diseases	Entrepreneurship Development Programme: Personality development: motivation, leadership Business opportunities: market surveys, project report preparation Financial planning and management Banking and schemes, repayments of loans Government schemes, subsidies available from the government Management of projects Customer service, labour management, profitability management Monitoring and followup



The budget

KVKs around the country are often very enthusiastic about running their own Paravet Training Programme, until they realise that a specific budget needs to be set aside for the programme apart from the available resource persons and infrastructure. In 2008, the MKVK spent around Rs. 25,000 per trainee as direct costs. The candidates themselves paid a contribution of Rs. 1,500 for the entire course; this amount could have come as loans from self-help groups. The costs covered training materials, simple food and accommodation for six months, travel by public transport for the internship period, costs of organising exposure programmes, faculty fees for external resource persons and costs of a first aid kit for every participant. Since ASETI, the Erode Milk Union and the Department of AH and Veterinary Sciences also host the participants, their direct expenses are not included in this budget.



how to use the manual

Training Paravets: a manual, is designed primarily for the use of a veterinarian who also follows participatory training methodologies. This manual contains material that is somewhat specific to Tamilnadu. In case you live elsewhere, you will need to modify some of the content to suit your area – your geography, the livestock species that are important to you, general economic and social conditions that exist in your place. We hold our training in Tamil, please translate the content to your preferred language. Therefore, this manual is a guide for the curriculum design and for using simple participatory methods in the classroom. The following section will explain the use of different terms within the manual.

Module title: This would indicate the broad topic you would deal with. Module titles have been simplified and tend to use non-technical language.

Module aim states what we hope to achieve in the long-term by conducting both classroom and practical components this training. It also explains the rationale for the module.

Learning objectives describe the concrete behavioural changes that the trainees should demonstrate at the end of the training module. These objectives can be evaluated in an objective manner and hence are worded using the following words – explain, list, demonstrate, describe, choose and not by subjective words like – understand, appreciate, know, etc. Learning objectives can be used for both pre-evaluation and post-evaluation directly.

Materials required: Only materials that must be prepared especially for this module are listed. You would also need

- a writing surface – blackboard with chalk, charts and markers, whiteboard and markers
- display system – a computer with a data projector for presentations, photos and videos, overhead projector for slides, surfaces to post and display posters or vinyl flex sheets with prints of photos

The Module is further divided into **Sessions**.

Classroom based **Session Durations** are between 30 minutes to 2 hours. Field based sessions could be longer.

Illustrative **Content** has been provided for each session. If your focus is different, you will have to develop alternate content from suitable references and texts. If the content is to be displayed, make sure it is in the most suitable language for your participant group. We have tried to tone down technical words and language. Several books and **Resources** are mentioned in each module. Many are free for download. You may also use material available in your libraries and local AH departments and universities.

Methods are listed for the particular session – you are free to change or improve them. What we have not included in this manual are games and energisers – though our trainers regularly use creative and participatory workouts. There are several resources for such activities and we encourage you to explore their use in your training. The methods mentioned are mostly lectures, presentations, brainstorming and discussions and demonstrations.

Lectures are usually delivered by the resource person who is considered an expert in the subject and participants do not have much choice in the pace or content of the lectures. To make lectures useful, we have usually paired them with discussions or presentations.



Presentations are like lectures but more interactive and use visual aids extensively. They may use computer presentations or flip charts.

Brainstorming is a process where all participants are encouraged to think freely about a given topic and respond without judging the ideas. It is usually an exercise to seek new ideas or explore many views.

Discussions can be in the plenary or small-groups. Every discussion is guided by a key topic or question and must be managed by the facilitator so that participants arrive at some results within the given time and within the scope of the question.

Demonstrations are exercises where particular skills are imparted hands on. In a demo, both trainer and trainee can participate.

Role plays are exercises where participants play act and assume roles and examine how discussions evolve depending on different perspectives held by people.

Process tells you how to deliver the content and elicit discussions among the participants in a step by step manner. It is always important to check participants' understanding after short intervals so that learning is ensured. Participants may have different rates of learning and it is the responsibility of the trainer to help them learn. If one methodology does not work, another must be explored – till we know that the learning objectives have been met satisfactorily. The onus is therefore on the trainer to be patient and skilled.

Stop and check! is the point where you evaluate learning after every session. Proceed only after all participants are at a satisfactory learning level.

Practical training is the major part of this programme – almost 70% of the course. It consists of field visits, camps, internships with the AH department or milk union, hands on training and PRA exercises.

Field visits are learning events where participants are taken to places where specific activities take place. Participants are mostly observers here and do not necessarily take part in the activities.

Internships are learning units where participants are placed under veterinarians and learn both how veterinary practice is managed as well as specific skills in first aid and veterinary nursing.

Camps are events usually called by the AH Dept or KVK or NGOs where Paravet trainees participate in both observing and providing first aid and veterinary nursing under the supervision of veterinarians.

Skills learning objectives are meant specifically for practical veterinary nursing and first aid skills and physical actions that require theoretical understanding but especially mastery of dextrous actions. All practical training received by Paravets are evaluated by skills learning objectives

How to evaluate? Trainees will be evaluated on the basis of written and practical tests and exercises at the end of each unit/module and the assessment of their performance and practical skills by their tutors. In this case participants are given several opportunities till they gain the necessary level of skills.

The **Note to the Trainer** offers tips and mentions any specific preparation or requirement during the session.



Animals and our life



module aim The purpose of this module is to enable participants to appreciate the role of animals in people's lives and livelihoods - especially that of poor families. The module provides an overview of the livestock scenario at different levels - national, state, district and block levels. The large picture will help participants understand the current and future trends in livestock populations, their health and contribution to the economy better. The module introduces the participants to the issues facing the livestock sector and the need for better management of animals and their environment. The participants would be able to perceive their role in the promotion of better livestock management where they work.

learning objectives At the end of this training module participants will be able to:

- Explain the importance of livestock in the rural economy
- Discuss and present the livestock and poultry populations at the national, state, district and block levels
- Describe the challenges of livestock management
- Describe the role of Paravets in improving the livestock sector.

module summary

Session Title	Duration
1. Why do people keep animals?	30 m
2. Livestock populations in our community	1 h
3. Challenges of livestock management	30 m
4. What do Paravets do?	1 h
Total	3 hours

materials Charts and markers, presentations

methods Lectures, presentations, brainstorming, discussions

guest lecture By experienced Paravets

handouts My cow is my lifeline, livestock data (national, state, district and taluk level)

note to the trainer



Modify this module to suit your area. Obtain statistics that are relevant to your state, district and block and provide them as handouts to the participants. Study any particular challenges to the livestock sector in your area and include it in the content.



1-1 Why do people keep animals?

- materials**
- Charts and markers
 - My cow is my lifeline - poster

content **Role of livestock and poultry in the rural economy**

Agricultural animals have always made a major contribution to the welfare of human societies by providing food, shelter, fuel, fertiliser and other products and services. They are a renewable resource, and utilise another renewable resource, plants, to produce these products and services. By combining animal rearing with crop production enables farming families to utilise farm by-products like crop residues, conserve and enhance soil fertility through the use of compost and increase household income directly through the sales of milk, meat and eggs. Animals are an important source of energy – such as draught power; they increase employment opportunities and when carefully managed, animals help farmers maintain ecological balance on their farms.



30 mins

India accounts for 57% of the world's buffalo population and 15% of the cattle population. There are about 51 million sheep, 115 million goats and 12.8 million pigs in the country (2004 - 2005).

Livestock rearing provides productive employment, especially self employment, and the most valuable supplementary income to a vast majority of rural households, most of whom are small and marginal farmers and landless labourers. Organic fertiliser produced by this sector is an important input to crop production and manure from livestock and draught power are chief source of energy in rural areas. Most of all, many people simply love animals and want to keep them around themselves.

- methods**
- Brainstorming
 - Lecture
 - Discussions

Brainstorm the participants on the importance of livestock.

process Key Question: 'Why do you think livestock are important to people in rural areas?'

Indicative answers are: Livestock are important because...

- They create more jobs – and hence reduce migration
- Families earn more
- Soil fertility is improved through the use of compost
- Ecological balance is maintained through recycling of crop waste into fertiliser
- Organic manure is produced – this supports integrated farming
- Food security in rural families improves
- Nutrition in poor families improves through consumption of milk, meat and eggs
- Livestock are a source of quick cash during times of need

Present the importance of livestock rearing in India and your local area. Use the poster 'My cow is my lifeline' to illustrate the interrelationships between farming and the cattle rearing.

Seek clarifications and responses to your presentation.

Participants are able to describe the importance of livestock in the rural economy.

**stop and
check!**

1-2 Livestock populations in our community

- materials**
- Charts and markers
 - Handouts of national, state, district and block-level data of livestock populations.

content Locate the latest data on national, state, district and block level livestock and poultry population. Sample data for India is given as an annexe at the end of this module.



1 hour

India has vast resource of livestock and poultry, which support the livelihoods of families in rural, peri-urban and even urban areas. India has the largest livestock populations in the world. It has 57 % of the world's buffalo population and 16 percent of the cattle population, the highest in the world. It ranks third in sheep and second in goat population in the world. The livestock population shows high degree of diversity in its composition. Out of total livestock in the country, 38.2% are cattle, 20.2% are buffaloes, 12.7% are sheep, 25.6% are goats and only 2.8% are pigs. All other animals are less than 0.5% of the total livestock. As per the 2003 livestock census India had 187.38 million cattle out of which 22.63 million were crossbred. The states of Tamilnadu, Maharashtra, Kerala, Uttar Pradesh, Karnataka and Punjab account for about 60% of the crossbred cattle population. Total export earnings from livestock, poultry and related products was Rs. 5,120 crore in 2004-05, of which leather accounted for Rs. 2,660 crore and meat and meat products for Rs. 1,720 crore. The livestock sector produced 90.7 MT of milk, 45.2 billion eggs, 2.12 MT of meat and 44.5 million kg of wool in 2004-05¹.

India is the largest producer of milk in the world with 90.7 million tonnes in 2004-05. The per capita availability of milk in India has increased to 231 gm/day during 2004-05 from 202 gm/day in 1996-97. Interestingly this growth of production is driven by small-holders.

¹ Virtual University for Agriculture Trade, Dept. of Agriculture, Govt. of Kerala.
http://www.vuatkerala.org/static/eng/advisory/animal_husb/introduction1.htm



note to the trainer



Data for India is provided for reference in this manual. Find the latest data for your state, district and block and provide these handouts to the participants. Especially, look for the trends in the market and import and export figures.

- methods**
- Lecture
 - Group discussions
 - Presentation

process Make a short presentation on the livestock population of India and your state, especially stressing on the large share of livestock in global terms.

Divide the participants into four sub-groups and provide each with all – national, state, district and block level data.

Ask each sub-group to study the data carefully and prepare a short (10 minute) presentation. Assign each level to one particular group for presentation. Each group should present data for that level – as well as the relation to the higher level if possible. In case you have data trends, participants should be able to present the trends in livestock populations across time – e.g., poultry populations are increasing while camel populations are decreasing, meat eating is going up, etc.

After each sub-group makes its presentation, open the floor for comments and discussions on the presentation – for about 5 minutes each. Steer the discussions with key questions.

Key Questions:

1. Where do you see high concentrations of livestock in India/your state?
2. Why do you think there are variations in livestock density and diversity in different regions?
3. What is happening in your hometown?

Sum up the session with overall comments using matter in the content and covering areas that were overlooked in the presentations.

stop and check!

The participants are able to present livestock data at different levels of the country. They are able to state the position of India in the global livestock scenario and therefore their importance in the economy. They are able to visualise/express trends in the livestock sector.

.....

1-3 Challenges of livestock management

materials ▪ Charts and markers

content The livestock sector while being essential to the livelihoods of the poor has significant challenges which make livestock rearing risky and discourages resource poor families. Understanding these challenges is essential to providing the right kind of support to livestock holders. The risks can be categorised under:

Production management: people need knowledge on how to rear livestock, how to adjust to demand and supply quickly. We need productive animals, improved structure and growth of animals, correct feeding practices and access to feed and forage, knowledge on many aspects – including food safety standards in export markets. In case of small livestock holders, they need the possibilities to organise for marketing and inputs.

Health management: livestock holders and service providers should have knowledge on healthcare for animals, have up-to-date information on disease outbreaks and preventive measures to be taken. Access to quality health care for animals is also needed

Infrastructure: quality veterinary care, hospitals, veterinarians, stockholding facilities, marketing facilities, timely information – are essential to profitably rear livestock in a globalised economy.



30 mins

Environmental sustainability: With global climate change, small holders will need ways to adapt – they may need animals that can cope with increased temperatures, reduced grazing lands, erratic weather, and disease resistance. If holders only keep a profit motive livestock rearing can also severely deplete natural resources.

Equity: While well to do livestock holders may have better access to markets, poor families and especially women in these families who are highly involved in livestock rearing may not have ready access to markets and control over earnings from the sector.

The above challenges are not easily overcome. But the presence of competent and committed persons can help to not only overcome the challenges but create a very profitable livelihood sector. E.g. the milk cooperatives in India have created a healthy dairy market.

methods ▪ Brainstorming
▪ Discussion



- process** Brainstorm on the challenges faced in managing livestock.
Key Question: 'What are the challenges in managing livestock in your area?'
Indicative answers are:
- Lack of fodder for cattle during dry season
 - Very thin and sickly animals
 - Seasonal diseases like bird flu and foot and mouth disease
 - Some people do not have experience managing cattle
 - High demand for mutton, but not enough people rearing sheep locally
 - No veterinary services in some areas at all
 - Etc.

Allow participants to discuss the points that are raised.

Conclude by presenting some of the common challenges of livestock management in general and those that are specific to your area. Stress on those that are considered as serious. Explain the challenges using examples like the impact of bird flu on the poultry sector in the world and the local area.

- stop and check!** Participants are able to list out the major challenges of livestock management in their area.

1-4 What do Paravets do?

- materials** ▪ Charts and markers

- content** In India, remote areas are not always serviced by trained veterinarians, and poor livestock holders may not have the ability to seek treatment in big towns and cities. Therefore, para professionals called Paravets, Stockmen, Animal Health Promoters, etc. are developed to provide basic health care and management services to the rural communities, especially the poor. Once trained, paraprofessionals become self-employed. A Paravet's role can be wide and depending on the willingness and ability of each individual any of the following roles can be assumed.



1 hour

- undertaking routine visits to farms to check the health of livestock
- meeting and consulting with owners
- providing simple services like deworming, first aid, vaccination, artificial insemination (AI)
- immunising animals against different forms of disease
- networking with and referring cases to other professionals and doctors
- enabling clients to network with government, private and voluntary agencies for better livestock management and other facilities

While Paravets are trained in a wide range of subjects, their primary role is for first aid and simple treatments – they are not supposed to play the following roles.

- Attempting complicated cases like dystocia, retained placenta, surgeries

- Artificial Insemination or pregnancy diagnosis before undertaking focussed skill upgradation on AI (which is a four months course)

- methods**
- Brainstorming
 - Discussion
 - Guest lecture by experienced Paravets
 - Lecture

process Brainstorm on the role of Paravets

Key Question: 'What is your role as a Paravet in supporting the livestock sector in your area?'

Indicative Answers

- To provide first aid to injured animals
- To provide basic health care services for cattle, small ruminants and poultry
- To call a trained veterinary doctor when needed

Supplement the responses with content.

Key Question: what is the Paravet not supposed to attempt?

Indicative answers:

- Surgery
- Pulling out a breech calf

Stress on the roles or activities that Paravets are not supposed to take – but where they need to immediately call for the local veterinarian.

Invite an experienced Paravet to share his or her experiences – on the role of the Paravet and the typical areas where services are provided (15 minute talk with 10 minutes of discussions).

A checklist for the talk may include:

- Background of the Paravet (education, previous jobs, year of service as a Paravet, training received)
- Number of cases attended per month
- Number of villages covered
- Types of cases attended
- Socio economic status of the Paravet before and after starting the services
- Linkages established with other agencies
- Any livestock related businesses started
- Most important role being performed
- How they manage their finances and office.

Open the floor for discussions and interactions with the Paravet.

Sum up the session with a short lecture/presentation on the role of the Paravet in strengthening the livestock sector – stressing on key issues and covering those issues that were not illustrated in the guest lecture.

Sum up the module with an overview of the key issues learnt and discussed during the day.

Participants should be able to describe the roles of the Paravet in strengthening the livestock sector in their area.

**stop and
check!**





Special activity

End the day with a commitment. Give each participant a lit candle. Ask all to stand in a tight circle. Read the code of conduct for Paravets and ask participants to repeat in unison. Ask them to place the candles on a central table around a large lit lamp. Lead a short prayer or affirmation – wishing for the programme to end in success. Close the module.

Paravet's Code of Conduct

Develop a Code of Conduct for Paravets in the local language to include some of the following aspects:

- To use one's skills and knowledge on livestock management for the benefit of the community - especially of poor families and women.
- To treat animals under one's care with professionalism, promptness and humanely
- To be honest in dealing with people and institutions.
- To learn and keep oneself up to date continuously

resources Chapter 1: Owen, E, et.al (2005): Introduction – the need to change the 'mind-set' (pp 1-11) and Chapter 2: Kitalyi, A, et.al (2005): Why keep livestock if you are poor? (pp 13-27)
In E Owen, et. Al (ed.) (2005). Livestock and Wealth Creation. Improving the husbandry of animals kept by resource-poor people in developing countries. Nottingham. NUP

Virtual University for Agriculture Trade – Dept. of Agriculture, Govt. of Kerala. http://www.vuatkerala.org/static/eng/advisory/animal_husb/introduction1.htm

State wise population of livestock and poultry as on 2003 (in thousands)

Source: Provisional census results received from State Governments

#	States/Union Territories	Cattle – Cross bred	Cattle – Indian breeds	Total Cattle	Buffaloes	Sheep	Goats	Pigs	Total livestock	Total poultry
1	Andhra Pradesh	1,107	8,193	9,330	10,630	21,376	6,277	570	38,895	102,278
2	Arunachal Pradesh	13	445	458	11	19	231	330	799	1,743
3	Assam	440	7,999	8,440	678	170	2,987	1,543	5,390	21,664
4	Bihar	1,274	9,455	10,729	5,743	382	9,490	672	16,432	13,911
5	Chhattisgarh	253	8,629	8,882	1,598	121	2,336	552	4,610	8,181
6	Goa	12	63	76	37	-	11	87	136	566
7	Gujarat	639	6,785	7,424	7,140	2,062	4,541	351	14,231	8,153
8	Haryana	573	967	1,540	6,035	633	460	120	7,345	13,619
9	Himachal Pradesh	677	1,559	2,236	774	926	1,125	3	2,881	767
10	Jammu Kashmir	1,320	1,764	3,084	1,039	3,411	2,055	2	6,816	5,568
11	Jharkhand	145	7,513	7,659	1,343	680	5,031	1,108	8,167	14,429
12	Karnataka	1,602	7,936	9,539	3,991	7,256	4,484	312	16,082	25,593
13	Kerala	1,735	387	2,122	65	4	1,213	76	1,358	12,216
14	Madhya Pradesh	317	18,595	18,913	7,575	546	8,142	358	16,704	11,705
15	Maharashtra	2,776	13,527	16,303	6,145	3,094	10,684	439	20,460	37,968
16	Manipur	69	349	418	77	6	33	415	553	2,941
17	Meghalaya	23	744	767	18	18	327	419	785	2,821
18	Mizoram	9	27	36	6	1	17	218	245	1,125
19	Nagaland	243	208	451	34	4	175	644	898	2,789
20	Orissa	1,063	12,840	13,903	1,394	1,620	5,803	662	9,489	17,611
21	Punjab	1,531	508	2,039	5,995	220	278	29	6,568	10,779
22	Rajasthan	464	10,390	10,854	10,414	10,054	16,809	338	38,284	6,192
23	Sikkim	80	79	159	2	6	124	38	178	322
24	Tamilnadu	5,140	4,001	9,141	1,658	5,593	8,177	321	15,800	86,591
25	Tripura	57	702	759	14	3	472	209	698	3057
26	Uttar Pradesh	1,634	16,917	18,551	22,914	1,437	12,941	2,284	39,980	11718
27	Uttaranchal	228	1,961	2,188	1,228	296	1,158	33	2755	1984
28	West Bengal	1,119	17,794	18,913	1,086	1,525	18,774	1,301	22704	60656
29	Andaman & Nicobar Islands	13	51	64	16	0	64	52	132	931
30	Chandigarh	5	1	6	23	-	1	0	24	152
31	Dadra and Nagar Haveli	1	49	50	4	-	21	3	28	106
32	Daman and Diu	0	4	4	1	-	4	0	5	29
33	Delhi	58	34	92	231	3	17	28	282	459
34	Lakshadweep	2	2	4	0	0	47	0	47	146
35	Puducherry	63	16	78	4	3	48	1	56	244
	All India	24,686	160,495	185,181	97,922	61,469	13,518	13,518	485,002	489,012



எல்லா உளமும் என்னுள் இருக்க! ஏற்றம் காண தாமதம் ஏதற்கு!!

My cow is my lifeline



புழைத்த வளவாண்மைக்கு வித்திடும் எளிய தொழில்நுட்பங்கள் OTHER ECO-FRIENDLY TECHNOLOGIES FOR SUSTAINABLE AGRICULTURE



பூசு - MULCHING



உயிர் உரம் - BIO FERTILIZERS



பி. டிரப் - P. TRAP



உயிர் கட்டுப்பாடு - BIO CONTROL MEASURES



பிடிவாய் - TRAP CROP



Breeds of livestock and poultry



module aim There is a large diversity of livestock species in any given area. Quick identification of livestock breeds and their characteristics will be a key skill for a livestock promoter. While information for the management of some of the popular breeds is often available, local breeds may not be well written about or discussed by the Animal Husbandry Department. Locally gained knowledge also becomes important. The purpose of this module is to familiarise learners to breeds, breed characteristics and utility of livestock and poultry. The module will help learners to become keen observers and use their skills of observation to learn more deeply about animals in their community.

learning objectives At the end of this training module participants will be able to spell out:

- What is meant by a breed and ways of classifying breeds?
- Characteristics of different livestock breeds both local and exotic - like cattle, goats, sheep, pigs, poultry and dogs.

module summary

Session Title	Duration
1. What is a breed? How are breeds classified?	15 m
2. Breeds of cattle	1 h 15 m
3. Breeds of buffalo	30 m
4. Breeds of goats, sheep and pigs	30 m
5. Breeds of poultry	15 m
6. Breeds of dogs	15 m
Total	3 hours

materials ▪ Charts and markers, pictures (in flex charts or presentation slides)

methods ▪ Lectures, presentations, brainstorming and discussions

note to the trainer



Modify the session content to include information most relevant to your area. While conducting this session, focus on existing local breeds in the learners' work areas.

resources Essential reading: <http://www.ansi.okstate.edu/breeds/> - Department of Animal Science – Oklahoma State University – has detailed and useful information about animal breeds across the world.



2-1 What is a breed? How are breeds classified?

materials ▪ Charts and markers

content



15 mins

A **breed** is a group of domestic animals with a homogeneous appearance, behavior, and other characteristics that distinguish it from other animals of the same species. “Animals that, through selection and breeding, have come to resemble one another and pass those traits uniformly to their offspring”¹. When bred together, animals of the same breed pass on these uniform traits to their offspring, and this ability — known as “breeding true” — is a definitive requirement for a breed. Animals of the same breed tend to have a common features, size, structure and also behavioural traits. E.g. Holstein Friesian cattle are good milk yielders, have black and white colouration; Rajapalayam dogs are light coloured and have a sleek body structure.

Classifying breeds:

Breeds can be Crossbreeds classified as:

- **Pure breeds:** The offspring of two animals of the same breed are called pure breeds.
- **Crossbreeds:** The offspring produced as a result of breeding animals of one breed with other animals of another breed are known as crossbreeds or mixed breeds.² Often exotic breeds are successfully crossed with indigenous breeds to obtain cross breeds which have sufficient desirable characters.
- **Indigenous or native breeds:** In biogeography, a species is defined as indigenous or native to a given region or ecosystem, if its presence in that region is the result of only natural resources, with no human intervention. Every natural organism (as opposed to domesticated organisms) has its own natural range of distribution, in which it is regarded as native.
- **Exotic or Introduced breeds:** A species is defined as introduced (also known as non-indigenous, alien or exotic) in a certain geographical area, if that area is outside the species’ native distributional range, and the species has arrived there by human activity.³

Why are breeds developed?

Breeders establish a breed by first selecting individual animals that possess the right characteristics they are looking for. These animals are called the breed foundation. Then the breeder uses the most suitable among the progeny to breed again and create the next generation. This process is called selective breeding. The written description of desirable and undesirable breed representatives is called as the ‘breed standard’.

¹ <http://www.ansi.okstate.edu/breeds/>

² <http://en.wikipedia.org/wiki/Breeds>

³ http://en.wikipedia.org/wiki/Introduced_species

Breed traits are passed on from generation to generation in purebreds. It is however necessary to maintain a large population of animals to maintain a breed without genetic defects cropping in due to inbreeding within a small breeding population.

Some of the characteristics that breeders look for are:

1. In cattle: milk productivity, disease resistance, ability to withstand local climatic conditions, gentle nature, draught ability, etc.
2. In goats/sheep: meat quality, ability to withstand arid climate, disease resistance, wool productivity,
3. In poultry: meat quality, growth rates, laying productivity, disease resistance, etc.
4. In dogs: gentleness, ferociousness, keen sense of hearing/smell, speed, guarding nature, disease resistance, size, discipline, etc.
5. In pigs: meat productivity, disease resistance, ability to withstand local climatic conditions, etc.

Why protect minor and unknown breeds?

It is important to protect indigenous species because they have often evolved to cope with particular conditions, circumstances or situations. They can become a breeding stock for cross breeding and with global warming, they may be able to cope with higher temperatures and stresses more effectively. For the long term survival of livestock and to protect the livestock economy, protecting minor and unknown breeds is essential.

- methods**
- Lecture
 - Brainstorming
 - Discussion

- process**
- Explain the terms breed, pure breed, cross breed, native breed and exotic breed.
 - Clarify any doubts.
 - Brainstorm the participants on the characteristics of breeds.
 - Key Question: 'how do you identify breeds in your locality?'
 - Indicative answers:
 - 'by the colour of the animal'
 - 'by the size and structure of an animal'
 - Key Question: 'what does an owner look for in a good breed of cows'
 - 'good milk yield'
 - 'size of the animal – the poor cannot keep a very big animal in their house'
 - Explain some of the breed characteristics of animals like cattle, sheep, poultry.
 - Open up a discussion on why minor or local breeds should be protected.
 - Explain the reasons for preserving the gene pool of local and minor breeds.
 - Sum up the session.

- stop and check!**
- Participants should be able to define the terms breed, pure breed, cross breed, native breed and exotic breed. They should be able to list out some characteristics that are sought after in different species of animals and also explain the need to preserve local and minor breeds.



2-2 Breeds of cattle

- materials**
- Charts and markers
 - Pictures of different cattle breeds

content Breeds of cattle:

Cattle were domesticated by humans over 10,000 years ago. Cattle have triple purposes – they provide milk, meat and labour to their owners. Other uses are leather from their skin and other products like gelatine, and rennet from their stomach for making cheese. Cattle breeds can be broadly classified into Indian and exotic breeds and milch, draught and dual purpose breeds.



Note to the trainer

Details about a few breeds are provided in the content for illustrative purposes. Find information about any breed that is important to your region.



**1 hour
15 mins**

Classification:

	Milch	Draught	Dual Purpose
Indian Breeds	Sahiwal, Gir, Red Sindhi, Tharparker	Amritmahal, Kangeyam, Malvi, Siri, Hallikar, Bargur	Hariana, Ongole, Deoni, Kankrej
Exotic breeds	Jersey, Holstein-Friesian, Red Dane, Brown Swiss		
New Breeds	Karan Fries, Karan Swiss		

Indian breeds

Milch breeds

Sahiwal

Home tract: Pakistan

Colour: Various shades of red, pale red and dark brown splashed with white

Features: Deep body, loose skin, short legs, broad head, stumpy horns, horns are short and thick, massive hump (in male) voluminous dewlap and pendulous sheath, long tail, navel flap is prominent in female.

Utility: Best dairy breed, milk yields 2500 kg per lactation. Bullocks are useful for slow work



Red Sindhi

Home tract: Karachi and Hyderabad in Pakistan

Colour: Deep dark red

Features: Medium size and compact, animals having well proportioned body, thick horns emerging laterally and end in blunt points; heavy hump, dewlap and sheath.

Utility: Milk yield 1400-1600 kg per lactation. Bullocks suited for road and field work.



Tharparker

Home tract: Tharparker district of Hyderabad in Sindh, Pakistan

Colour: White or Grey

Features: Medium size, deep built, short straight and strong limbs. Strong well proportioned frame, broad poll and forehead is slightly convex with medium sized horn. Moderately developed dewlap with straight and moderately long back; the tail is fine with black switch. White or light grey line along the spine in young animals.

Utility: Cows are good yielders. Milk yield 1800-2600 Kg. Bullocks suited for carting and ploughing



Dual purpose breeds

Hariana

Home tract: East Punjab

Colour: White or Light grey

Features: Proportionate body, compact graceful appearance. Head is carried high, horns are short, curving upward and inward and stumpy. Flat forehead and a bony prominence in the centre of the poll; ears are small and sharp. Skin is fine and close to the body, sheath short, navel flap absent. Legs are moderately long and lean. Tail is short, skin and tapering towards the end with a black switch reading just below the hocks.

Utility: Bullocks are good working animals for fast ploughing and road transport, cows are average milkers with 1400 kg / lactation.



Kankrej

Home tract: North Gujarat

Colour: Silver grey, iron grey or black.

Features: Broad chest, forehead dished in the centre, strong curved horns, powerful body, straight back. Hump is well developed, tough skin, moderately developed dewlap. Tail is of moderate length with black switch

Utility: Milk yield 1400 kg per lactation (Cows are average milkers). Bullocks are used for road and field work.





Draught breeds

Amritmahal

Home tract: Karnataka

Colour: Grey, varying from almost white to nearly black with white grey markings.

Features: Short straight back, well arched ribs, powerful sloping quarters; narrow face and prominent forehead with furrow in the middle. Well developed dewlap and hump, very small sheath, and close skin. Tail is of moderate length with a black switch. Muzzle, feet and tail are usually black. Grey coloured body with dark head, hump and quarters.

Horn emerges from the top of poll fairly close together in an upward and backward direction and terminates in sharp points.

Utility: Best draught breed. Cows are not so good milkers



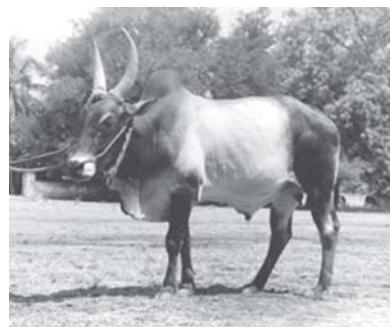
Kangayam

Home tract: Coimbatore district of Tamilnadu

Colour: Bull is of grey with dark grey to black markings, while the cow is white with black markings.

Features: Strong horns with sharp tips. Body moderately long, straight back, short and strong neck, moderate sized hump, wide muzzle, strong limbs, small dewlap, fine skin, very small sheath, well developed quarters and fine tail.

Utility: bulls are excellent for hard work. Cows are poor milkers.



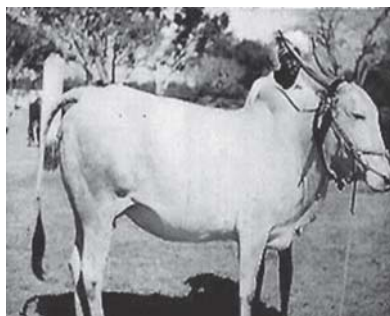
Hallikar

Home tract: Hassan and Tumkur district of Karnataka

Colour: Grey to dark grey

Features: Head is usually long with a bulging forehead, furrowed in the middle. Long horn emerges close to each other from the top and curving upwards to terminate in sharp points. The face is long with small ears. The hump is moderately developed

Utility: Bullocks are excellent draught type. Cows are poor milkers.



Bargur breed:

Home tract: Erode district of Tamilnadu

Colour: Usually red and white. Sometimes light grey.

Features: Forehead not so prominent, horns grow backwards and upwards. Hump moderately sized, dewlap fine. Tail is short.

Utility: Bullocks unsurpassable in hardiness, strength and speed, difficult to train. Cows are poor milkers.



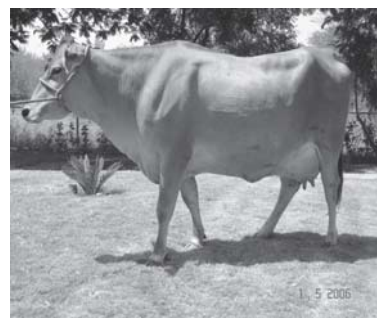
Exotic breeds

Jersey:

Features: Jersey is one of the oldest dairy breed. It originated from Jersey Island and is adaptable to a wide range of climatic conditions and heat. Cows show very marked refinement about their heads and shoulders, carry long, straight top lines, and usually carry out long and level at the rump. For their size, they are usually deep in the body and full and deep in the barrel. Jersey bulls, while small as compared to the other dairy breeds, are extremely masculine. Jerseys are nervous and sensitive animals.

Colour: The colour of the breed ranges from white to grey, and it is broken and found as patches.

Utility: Jerseys have good udder with large teats. The lactational yield is 4950 kg. The milk has a characteristic yellow colour because of high carotene content. The bulls are more vicious than other breeds.



Holstein Friesian,

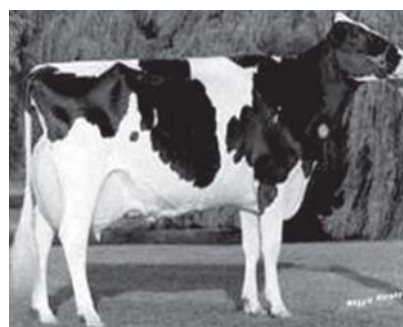
Holstein, easily recognised by their distinctive markings and outstanding milk production

Colour: Black and white or red and white.

Features: Broad and long hips. They have deep barrels or body trunks. Their horns slant forward but curve inwards. A Holstein cow usually has black ears, white feet, and white end of tail

Utility:

The lactational yield is 7,655 litres/year



- methods**
- Lecture and presentations,
 - discussions

process Brainstorm on breeds of cattle known to participants.

Key Question: 'Can you mention some breeds of cattle?' 'What characteristics do owners look for in cattle?'

Present features of different breeds of cattle in the country and specific to your area.

Open the floor for discussion and clarify any doubts.

stop and check! Participants should be able to list features that people look to in cattle and mention some key cattle breeds and their features.





2-3 Breeds of buffalo

- materials**
- Charts and marker
 - Pictures of buffalo breeds

content Domestic buffalo have descended from wild-water buffalo and are found in hot and wet regions of the world. Buffaloes are also called black cattle. Their milk production is higher than that of indigenous cattle. They have higher degree of resistance to a number of diseases (E.g., brucellosis, foot and mouth disease). Because of their large rumen volume, high rate of salivation and slow rumen motility, digestibility of dry matter and crude fibre is also comparatively higher in buffaloes than in cattle. The microbial population is higher in rumen of buffalo than of cattle.



30 mins

Murrah

Home tract: Punjab, Delhi

Colour: Jet black

Features:

Deep massive frame with short, broad back and a comparatively light neck and head. Short, tightly curled horns, well developed udder and long tail with a white switch reaching to the fetlock. Short massive limbs with good bone, broad hoofs and drooping quarters. White markings on the tail, face and extremities. Skin is soft, smooth, with scanty hair

Utility: Efficient producer of milk. The milk yield 1400-2000 kg.



Surti

Home tract: Southern west part of Gujarat

Colour: Black or Brown and the colour of hair varies from rusty brown to silver grey.

Features: Broad and long head with a convex shape at the top in between the horns. Sickle shaped and flat horns which grow in a downward and backward direction and then upwards at the tip forming a hook. The neck is long in female, thick and heavy in male. The udder is well developed straight back, and medium size.

Utility:

Average lactation yield of well bred animal is 1600 kg.



Other breeds that you can discuss: Jafarbadi, Mehsana, Nili Ravi, Bhadawari, etc.

- methods**
- Lecture
 - Presentation
 - Discussion

process Brainstorm on breeds of buffalo known to participants.
Key Question: 'can you mention some breeds of buffalo?' 'what characteristics do owners look for in buffalo?'
Present features of different breeds of buffalo in the country and specific to your area.
Open the floor for discussion and clarify any doubts.

stop and check! Participants should be able to list features that people look to in buffalo and mention some key buffalo breeds and their features.

2-4 Breeds of sheep, goats and pigs

- materials**
- Charts and markers
 - Pictures of sheep, goat and pig breeds

content

	Sheep Breeds	Goat Breeds	Pigs
Indian	Mecheri, Kilakarishal, Vembur, Coimbatore White, Ramnad White, Trichy Black, Madras Red, Bannur	Jamnapari, Beetal, Barbari, Tellicherry, (local to Erode) Molai and Palai Adu	Nondescript
Exotic	Merino, Corriedale	Toggenburg, Saanen, Anglonubian, Alpine	Large White, Yorkshire



30 mins

Breeds of Sheep

Sheep were some of the first animals to be domesticated, perhaps over 6000 years ago. Sheep are traditionally a poor person's companions. Sheep were selective bred for their wool type, their flocking instinct and for meat.

- Sheep rearing is one of the major sources of economic sustenance for marginal farmers and landless labourers in our country.
- The farmers raise their stock on public grazing land by employing self labour with negligible economic input and marginal output – this is made easy due to the sheep's flocking instinct – where they tend to stay close to other sheep or their leader or even a dog.
- Sheep are economic converters of grass into meat and wool.
- Sheep will eat more varieties of plants than any other kinds of livestock. This makes them excellent weed destroyer.
- Sheep do not need expensive buildings to house them and on the other hand require less labour than other kinds of livestock.



Indian Breeds

Mecheri

Distribution: Mecheri, Kollathur, Nangavalli, Omalur and Tarmangalam Panchayat union areas of Salem district and Bhavani Taluk of Erode district.

Breed characters:

Medium sized animals. Light brown in colour with occasional white spots on head or in other body parts. Both sexes are polled. Tail is short and thin. Ears are medium sized. Body is covered with very short hairs. The adult males weigh about 35 kg while female 21.5 kg

Production:

Dressing percentage on the basis of slaughter live weight is 54.5%. The skin is the highest quality of sheep breeds in India and is highly prized

Uses: Meat purpose



Vembur

Distribution: Vembur, Melakarandhai, Keezhakarandhi, Nagalpuram, Kavundhanapatty, Achangulam and some other villages of Pudur Panchayat Union and Vilathikulam Panchayat areas of Thirunelveli district of Tamilnadu

Breed characters:

Tall animals. Colour is white with irregular red and fawn patches all over the body. Ears are medium sized and drooping. Tail is thin and short. The body is covered with sort hairs which are not shorn. The adult male weighs about 34 kg while the females attains on an average 27 kg.

Uses: Meat purpose



Coimbatore White

Distribution:

Coimbatore and Madurai districts of Tamilnadu and bordering areas of Kerala and Karnataka.

Breed characters:

Medium sized animals, white with black or brown spots. Ears are medium sized, tail is short and thin. Males are horned. Females are polled. Fleece is white, coarse, hairy, and open. Adult male weighs about 24 kg while the female attain about 20 kg. Dressing percentage on pre slaughter live weight basis at 6 months is 38.20%.

Uses: Meat and wool



Madras Red

Distribution: Chengalpet and Madras

Breed Characters:

Medium sized animals. Body colour is predominantly brown colour, the intensity varying from light tan to dark brown; some animals have white markings on the forehead, inside the thighs and on the lower abdomen. Ears are medium long and drooping. Rams have corrugated and twisted horns, the ewes are polled. The body is covered with short hairs which are not shorn. The adult males weigh about 36 kg and females attain about 23kg.

Dressing percentage on pre slaughter live weight basis - 41.15%.

Uses: Meat purpose



Exotic Breeds

Merino

It is the most popular fine- wool breed of the world. The breed is a native of Spain and has spread throughout the world. Wrinkles or folds in the skin are qualities of this breed. Ewes are polled, while the rams have rather large, heavy spirally turned horns. Skin is pink, face and legs are white, thin tailed. Head and legs are covered by wool. Merinos are extremely hardy, being able to survive under adverse weather as well as poor grazing conditions.

Uses: Wool purpose



Breeds of Goat

Goats were domesticated as far back as 7000BC (9000 years ago). Strangely they and the domestic cat are the only two species that can return to the wild state very quickly. Goats are bred for four primary reasons – fibre (wool), milk, meat and skin. The goat is a poor man's cow because of its immense contribution to the poor people's economy. In Indian farming conditions goat rearing becomes an inseparable counterpart of mixed farming system. Because of wide adaptability, low investment, high fertility and fecundity, high feed efficiency, low feed intake and easy management, goat rearing is recommended as the best choice for the rural people of India.

Goats not only supply nutritious and easily digestible milk to their babies but also regular source of additional income for poor and landless or marginal farmer. The excreta and urine of the goat is richer in nitrogen, potash and phosphorus than cow dung and fertilise cultivable lands enormously. Goat milk is easily digestible because of smaller sized fat globules and has much less allergic problems than milk of other species of livestock.



Indian breeds

Jamnapari

Distribution:

It is the biggest and most majestic breeds of goat in India. The breed has been extensively utilised to upgrade indigenous breeds for milk and meat. Pure stocks are found in Etawah district of U.P.

Breed characters:

Large sized, tall, generally white or light yellowish tan with light brown spots on the neck and face and occasionally patches of tan or black are found on the body. The typical character of the breed is a highly convex nose line with a tuft of hair known as Roman nose. The ears are very long, flat and drooping. Long and thick hair on their hind quarters. Both sexes are horned with short and thin tail. Horns are short and flat. The adult male weighs about 50- 60 Kg and female attains about 40- 50 kg

Performance:

Milk – average daily milk yield varies from 1.5- 2 kg per day.

Kidding- usually a doe kids once a year giving birth to single in 57% while twins in 43% of cases.

Meat- dressing percentage on pre slaughter live-weight basis is about 45% at 6 months and 48% at 9 months.

Barbari

Distribution:

The breed is distributed at Etawah, Agra, Mathura and Aligarh district of U.P and Bharatpur district of Rajasthan

Breed characters:

Small animals with compact body, where is wide variation in coat colour, but white colour with small light brown patches is most common. Ears are short, tubular and erect. Both sexes have twisted horns. Bucks have a large thick beard. The adult male weighs about 40.0kg and female attains about 24 kg.

Performance: Milk- daily milk yield averages about 750 ml-1000 ml per day

Kidding- the doe may kid twice in period of 12-15 months. Litter size – single in 25%, twins in 65%, and triplets in 10 %.

Tellicherry

Distribution:

Mostly reared in Kozhikode, Kannur, and Malappuram districts of Kerala.

Breed Characters: The animals are medium in size.

They have no uniform colour which varies from completely white to full black. 30% are long haired.

All males and small number of females are bearded, head with flat and occasional Roman nose and medium sized ears directed outward and downward. The adult male weighs about 38 kg and female attains about 31 kg

Performance:

The average milk yield of this breed is 100-190 kg per lactation. They yield 0.9-2.8 kg of milk per day. The litter size is 50.5% single, twins 42.4%, triplets 6.6%, quadruplets 0.5%.

Exotic breeds

Toggenburg:

Origin: Toggenburg valley in northeast Switzerland.

Breed characters:

Brown with white stripes on each side of face. Hornless with some exceptions. Large goats having long thin neck which are kept erect. The skin of the doe is very soft and pliable. The udder is well attached and carried high. Toggenbergs are adaptable to a variety of climate but perform well under cooler conditions. Average live weight is 60-65 kg.

Performance:

Average daily milk yield 1-3 kg per day with 3.5% fat

Saanen:

Origin: West and Northwest Switzerland.

Breed characters:

White to biscuit in colour with black spots on the nose, ears and udder. The breed is polled. The goats are large in size with straight nose and erect ears pointed forward and upward. The udder is well developed. It is known as milk queen of the goat world. Average live weight is 55-70 kg. It is sensitive to light and requires shade.

Performance:

Average daily milk yield 1-3 kg per day with 3.5% fat.





Breeds of Pig

Pigs were perhaps domesticated first in China almost 9000 years ago. They all descended from the Eurasian wild boar. Unlike most domesticated animals that developed in farming communities, pigs were domesticated in urban areas.

Large white Yorkshire:

Colour: Entirely white in colour.

Head: Moderately long, face slightly dished, snout broad, wide between the ears

Neck: Long, fine and proportionately full to shoulders with wide and deep chest

Legs: Straight and well set, level with the outside of the body, with flat bone

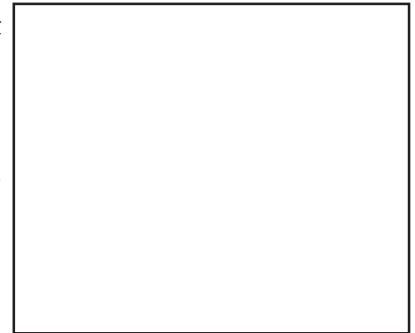
Back: long, level and wide from neck to rump

Skin: Fine, white, free from wrinkles

Hair: Non curled light weight coloured hairs seen all over the body.

Live weight: Mature boars weight from about 300 to 450 kg, while the average sow weights from 250-350 kg

Able to tolerate adverse climatic condition.



Local Breeds:

Smaller sized animal do not have any definite characteristics, grow slowly, produce small litters and the meat type is of inferior quality. Poor farmers often do not provide the minimum attention to pigs and let them loose scavenge in village dumps. However exotic breeds may be crossed with local stock to obtain smaller but hardier crossbreeds.

methods

- Lecture
- Presentation
- Discussion

process

Repeat the following methodology for the above livestock species.

Brainstorm on breeds of sheep, goat, pigs known to participants.

Key Question: 'can you mention some breeds of sheep, goat, pigs?' 'what characteristics do owners look for in sheep, goat, pigs?'

Present features of different breeds of sheep, goat, pigs in the country and specific to your area.

Open the floor for discussion and clarify any doubts.

stop and check!

Participants should be able to list features that people look to in sheep, goat, pigs and mention some key sheep, goat, pigs breeds and their features.

2-5 Breeds of poultry

materials ▪ Charts and markers, pictures of poultry and presentation slides

content Poultry (chicken) have been domesticated several thousand years ago and show a wide variation in their characteristics. The physical traits used to distinguish poultry breeds are size, plumage colour, comb type, skin colour, number of toes, amount of feathering, earlobe colour, egg colour, and place of origin. They are also roughly divided by primary use, whether for eggs, meat, or ornamental purposes, and with some considered to be dual-purpose. Some chicken are also bred for fighting. Most of the poultry species thrive well under a variety of agro climatic conditions and can be raised successfully almost anywhere provided certain minimum management and nutritional requirements are met with. They are also efficient converters of feed into animal protein compared to other livestock species. Poultry farming has now become very popular.



15 mins

Advantages of backyard poultry farming:

- Provides additional income to farming families
- Integrates well with other agricultural operations
- Waste materials like insects, ants, fallen grains, green grass, kitchen waste, etc. can be efficiently converted into eggs and chicken meat for human consumption.
- Minimises environmental pollution due to less concentration of birds
- Eggs and meat from birds have low cholesterol concentration.
- Enhances soil fertility in backyards (15 chicken produce 1-1.2 kg of manure/ day)
- Provides employment to rural people.

Poultry breeds by purpose:

Poultry Breeds	Eggs	Meat	Dual Purpose
Indian		Assel, Busra, Chittagong, Karaknath, Cochin	Langshan, Brahma, Giriraja, Girirani, Vanaraja
Exotic	Leghorn, Minorca	Cornish	Plymouth Rock, Rhode Island Red, Australop

Classes of chicken breeds: based on the origin of the chicken breeds they are divided into classes - American class, Asiatic, English, and Mediterranean.

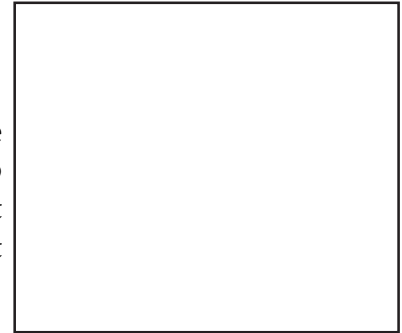


Breeds of Chicken

Mediterranean Class

Leghorn

Leghorn is small and very compact in form, carries the tail rather low and has a small head with well set comb and wattles. It has a relatively long back, prominent breast, and comparatively long shanks. It is the most common breed in commercial poultry farms.



Indian Breeds (Desi)

Indian breeds are mostly nondescript and are of very little value as layers. However, they manage well under freerange conditions as they have better disease resistance, good reflexes to escape from predators and better roosting/brooding abilities.

Aseel

Pea comb which are small but firmly set on head, wattles and ear are bright red and the beak is short, face is long and slender and not covered with feathers. The eyes are compact; neck is long uniformly thick but not fleshy. The body is round and short with broad breast, straight back, tail is small and drooping. Legs are strong, straight, and set well apart.



Karaknath

The skin, beak, shanks, toes and toes of feet are slate like in colour. The comb, wattles and tongue are purple. Varying degrees of black colouration are also seen in the skeletal muscles, tendons, nerves, meninges, brain, etc., the blood is darker than the normal blood.



Ideal chicken breeds for backyard rearing:

Giriraja, Girirani:

Both these breeds can be reared for their eggs and meat. The birds have a high egg production potential along with better growth compared to local varieties and are suited for mixed and backyard farming.

Both the birds attain maturity from the 22nd week after hatching. Females attain a body weight of about 3 kg and the males about 4 kg. Giriraja female lays about 160-170 eggs a year while Girirani lays about 180-190 eggs. The egg shell is brown in colour and thicker than that of commercial eggs and does not break easily.

No special care is required to grow them. They can be raised as free roaming birds and can be fed with locally available materials.

Vanaraja bird:

Vanaraja can sustain and perform well under harsh and adverse environment. Vanaraja have multicolour plumage, long shanks and high disease tolerance. The longer shanks facilitate faster movement of the bird from predators. The males of Vanaraja attain optimum body weight for table purpose at around 10 -12 weeks of age on low plane of nutrition. The females of Vanaraja lay up to 150 eggs per year under free range conditions.

- methods**
- Lecture
 - Presentation
 - Discussion

process Brainstorm on breeds of poultry known to participants.

Key Question: 'can you mention some breeds of poultry?' 'what characteristics do owners look for in poultry?'

Present features of different breeds of poultry in the country and specific to your area.

Open the floor for discussion and clarify any doubts.

stop and check! Participants should be able to list features that people look to in poultry and mention some key poultry breeds and their features.

**note to the
trainer**



You may also include content about other fowl like ducks, guinea fowl, quail, etc.



2-6 Breeds of dogs

materials ▪ Charts and markers

content Dogs show more variety in terms of size, behaviour, temperament and activity levels than any other species in the world. Normally, nutritional, care and behavioural training requirements change considerably from dog to dog and at different stages of life. Dogs are bred for the functions they serve – companion dogs, guard dogs, hunting dogs, pastoral dogs and sled dogs. The commonly seen yellow-brown local breed is called the Indian Pye Dog or Indian Feral Dog is considered a Primitive or Aboriginal Dog and several well known hunting breeds belong to this group¹.



20 mins

Large breeds

Large sized puppies have very special nutritional requirements because they grow differently from puppies of regular sized breeds. The time taken by a puppy to reach his adult weight varies considerably among different breeds, with larger breeds taking longer to reach maturity (11 to 15 months). So they need to be kept on a puppy food diet for a longer period. Also large breed puppies have a lower tolerance for excess calcium in their food, and calcium supplements given in addition to a balanced diet can actually prove harmful for bone development

German shepherd

Colour: Black, tan, cream, solid black, solid white, solid sable

Physical traits:

Robust, supple, elongated, muscular, dignified, strong

Personality/Temperament:

Very intelligent, loyal, faithful, versatile, calm, fearless, courageous, self confident, reliable, obedient, protective, responsive, alert, aloof, and does not warm up fast to strangers, some may be timid, anxious, nervous, shy, or bite.

Hair type:

Medium: Dense, harsh, thick, stiff, flat

Long: Luxurious

Labrador

Colour: Yellow, chocolate, black

Hair Type:

Short, water repellent

Personality/temperament:

Gentle, affable, gregarious, family oriented, outgoing, eager to please, willing to learn, adaptable, water loving, loyal, dependable, easy to train, some may be aggressive, shy.

¹http://en.wikipedia.org/wiki/Pariah_dog

Doberman

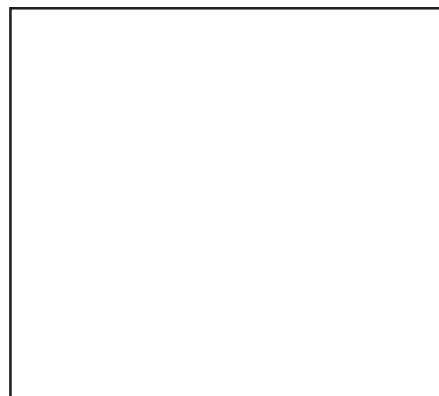
Colour: Black, brown, Blue, red, fawn with distinct red rust markings on head, chest, and feet

Physical traits: Good sense of smell, clean appearance

Hair type: Short, thick flat, smooth

Personality:

Well bred dogs are devoted, easy to train, quick to learn, affectionate, elegant, watchful, energetic, alert, obedient, loyal, dignified, devoted, fearless, determined, aloof to strangers, some can be aggressive, nervous, and bite



Small breeds

Because of their size, toy breeds have a different metabolism from larger dogs. They usually have a longer life span and a more rapid growth rate. However, they are also more susceptible to a number of health problems. Small breed dogs are more likely to develop calcium oxalate stones can lead to urinary tract disorder. The urine of small breed dogs has a greater risk of stone formation as compared to large breeds. They need clean drinking water to be available at all times and a diet that will help them maintain urinary health

Pomeranian

Colour:

Black and tan, brindle, brown, light or dark blue, gray, red/orange, cream, /sable/white

Physical traits:

Hearty, strong

Hair type:

Long profuse, thick, straight, harsh outer coat, soft dense under coat

Personality/temperament:

Vivacious, extrovert, intelligent, alert, active, spirited, faithful, inquisitive, adaptable, devoted, happy, clever, entertaining, obedient, loves to be pampered, barks a lot, sheds, will challenge larger dogs.



Dachshund

Colour: Any

Physical traits: Small, long back, short legs, strength

Personality/ Temperament:

Loyal, intelligent, playful, individualistic, self willed, affectionate, brave, dominant, cunning,





relentless, and vigilant

Breeds of dogs in Tamilnadu:

Rajapalayam:

The Rajapalayam is an Indian sight hound. It was the companion of the royalty and aristocracy in Southern India, particularly in the town Rajapalayam from where it gets its name.

Appearance: It is a large dog. The most prized colour is milk white, with a pink nose, and golden eyes. However, other colours including spotted or solid, black, and brown, are known to occur. In the past, puppies of colour were usually culled from the litters since the owners preferred the pure white dogs. The coat is short and fine. An extremely handsome and graceful dog, the Rajapalayam has a gait similar to the trotting of a thoroughbred horse.

Temperament:

The Rajapalayam was used predominantly for hunting wild boar and as a formidable guard dog. It needs wide open spaces and is very affectionate and devoted towards its owner, although not always demonstrative.

methods

- Lecture
- Presentation

process

Brainstorm on breeds of dogs known to participants.

Key Question: 'can you mention some breeds of dogs?' 'what characteristics do owners look for in dogs?'

Present features of different breeds of dogs in the country and specific to your area.

stop and check!

Participants should be able to list features that people look to in dogs and mention some key dogs breeds and their features.

note to the trainer

Sum up the module, recap the need to understand and identify breeds.

Reinforce the learning by going through key breed characteristics when studying animals during field visits.

The animal body

module aim The purpose of this module is to make the learners familiar with the external parts, digestive and reproductive organs of ruminants and poultry. This module is essential for disease diagnosis and treatment of common ailments. The module also aims to make participants comfortable with handling animals for clinical examination and treatment.

learning objectives At the end of this training module participants will be able to:

- Explain the external parts of cow, buffalo and poultry
- Identify and draw the reproductive organs of bull, cow, sheep/goat and poultry

module summary

Session Title	Duration
1. External parts of a cow and buffalo	1 h
2. Reproductive organs of bull and cow/ruminants	1 h 30 m
3. External parts and reproductive organs of poultry	30 m
Total	3 hours

note to the trainer

This module must be reinforced with learning on the field. Use every available opportunity to explain anatomy and morphology of animals.

methods Charts and markers, pictures, models, live animal specimens and videos

materials Brainstorming, discussions, lectures, image and video presentations, demonstration

resources Dr. Rodney Geisert: Learning reproduction in farm animals: Missouri State University – has excellent videos for this module. <http://animalsciences.missouri.edu/reprod/video/index.htm>
www.animalcorner.co.uk
<http://www.intute.ac.uk/healthandlifesciences/veterinary/>
<http://www.poultry.uga.edu/academics/pslab202.htm>
<http://vetmedicine.about.com/>



3-1 External parts of a cow or buffalo

- materials**
- Pictures
 - Charts and markers
 - Live animal for demonstration

content What are the different external parts of a cow and buffalo?



1 hour

Picture courtesy: <http://www.holstein.ca/english/Breed/parts.asp> - Holstein Canada

- methods**
- Brainstorming
 - Lecture
 - Demonstration

process Brainstorm the participants on the external parts of a cow by showing a picture.

Key Question: 'can you mention the external parts of this cow?'

Participants may be able to mention some of the larger parts. Show some of the key external parts on the picture. If possible arrange for a live cow to be brought to the training venue and explain the external parts. Alternatively, explain through models. Mention the importance of some of the parts.

Immediately conduct an informal quiz, asking participants to name the parts that you point out to.

stop and check! Participants are able to correctly name the external parts of a cow.

3-2 Reproductive organs of a cow, bull/ruminants

- materials**
- Pictures and videos
 - Charts and markers
 - A live cow/bull or models or specimens of reproductive organs of cattle and ruminants
 - Large magnifying lens
 - Videos

content **Reproductive organs of Bull and Cow/Small ruminants**
The pictures below show the schematic diagrams of the reproductive organs of bulls and ruminants



1 hour
30 mins

Bull:

1. Testes
2. Epididymis
3. Vas deference
4. Seminal vesicle
5. Prostate gland
6. Cowper's gland
7. Sigmoid Flexure
8. Penis
9. Sheath

Sheep/Goat

1. Vulva
2. Vagina
3. Clitoris
4. Cervix
5. Uterus and horns
6. Oviduct
7. Ovary



- methods**
- Lecture and quiz
 - Video show
 - Demonstration using a live animal or models or specimens

process Collect a uterus from a slaughter house for effective demonstration of anatomy of a cow. Using pictures, present the various parts of the reproductive organs of cows and bulls. Differentiate between external and internal genitalia. Mention briefly the functions of each part.
Demonstrate using the specimen brought from the slaughter house. Take appropriate precautions while doing so. Let participants use a large magnifying lens to understand the structures of these organs.

Recap the session and conduct a short quiz for participants to correctly name the parts and their functions when shown in the picture or specimen.
Assign students to draw these pictures for their records.

Similarly repeat the steps for the reproductive parts of sheep and goats.
http://vetmedicine.about.com/od/ruminant/anatomy/Ruminant_Anatomy_Cows_Goats_Sheep_Llamas.htm has a good animated version of goat reproductive system.

stop and check! Participants are able to correctly identify the different parts in the reproductive organs of cows and bulls and sheep/goats. They are able to describe in brief the functions of each of these organs.

3-3 External parts and reproductive organs of poultry

- materials**
- Charts and markers
 - Pictures and videos
 - Specimens of reproductive organs of poultry

content External parts and reproductive organs of poultry

What are the different external parts of a cock and a hen and its reproductive organs?

Picture: http://www.animalcorner.co.uk/farm/chickens/chicken_anatomy.html

- methods**
- Brainstorming
 - Lecture
 - Demonstration

process Collect chicken reproductive parts from a slaughter house for effective demonstration of anatomy. Additionally use pictures from the University of Georgia, Department of Poultry Sciences – Lab Review page: <http://www.poultry.uga.edu/academics/pslab202.htm>



30 mins

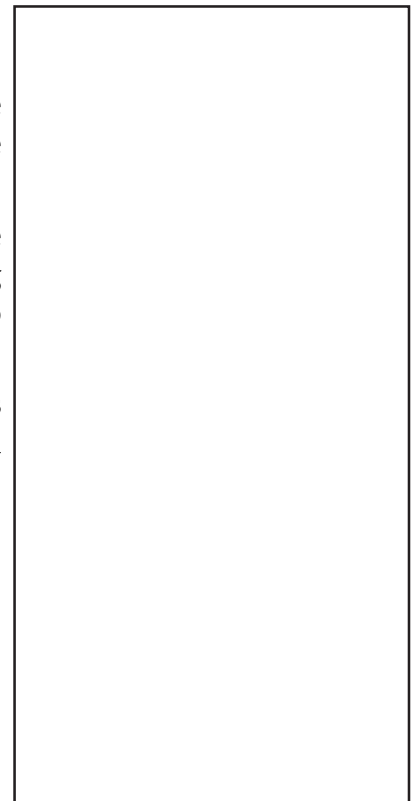
Using pictures, present the various parts of the reproductive organs of chicken. Mention briefly the functions of each part.

Demonstrate using the specimen brought from the slaughter house. Take appropriate precautions while doing so. Let participants use a large magnifying lens to understand the structures of these organs.

Recap the session and conduct a short quiz for participants to correctly name the parts and their functions when shown in the picture or specimen.

Assign students to draw these pictures for their records.

1. Ovary, 2. Ligament of infundibulam, 3. Infundibulam, 4. Magnum, 5. Uterus, 6. Vagina, 7. Cloaca, 8. Rectum, 9. Rudiment of right oviduct



stop and check! Participants are able to correctly identify the different parts in the reproductive organs of chicken. They are able to describe in brief the functions of each of these organs.

Sum up the entire module and close after clarifying any doubts that remain.



Hygienic animal care

module aim Animal welfare is key to ensuring productivity of animals and ensured livelihoods of people. The purpose of this module is to create awareness on aspects of animal welfare, animal hygiene, housing, and management and to impart skills to handle animals and determine their age. These are practical aspects of veterinary extension that the learners will eventually provide in ensuring preventive health care for animals.

learning objectives At the end of this training module participant able to:

- Define hygiene and explain its importance
- Compare a healthy animal against a diseased one
- Explain how hygienic housing ensures the management of healthy livestock
- Demonstrate ways of handling animals
- Correctly determine the age of cattle
- Describe aspects of care and management of pregnant cows and calves
- Describe the animal diseases caused by unfavourable weather

module summary

Session Title	Duration
1. Hygiene and its importance	30 min
2. Healthy animals and diseased animals	30 min
3. Handling of animals	1 h
4. Caring for pregnant and lactating cows, calves and heifers	1 h 30 min
5. Clean milk production	1 h
6. Special care of bullocks and buffaloes	30 min
7. How weather affects livestock	30 min
8. Determining the age of ruminants	30 min
Total	2 days

Total duration: 2 days – 6 hours in the classroom or in theory sessions, and 1 day in the field for demonstration and practice by the participants

materials Charts and markers, MKVK IFD Film, pictures of animal diseases, videos, castrator, tincture iodine, blade and thread, live animals for demos.

methods Brainstorming, discussion, lectures, presentation, demonstrations, video shows, field visit

field visit To cattle, goat, sheep and poultry farms and veterinary dispensary



4-1 Hygiene and its importance

- materials**
- Charts and markers
 - Myrada KVK's 9 minute video on Integrated Farm Development
<http://www.myrada.org/film8.html> to watch as streaming video or
<http://www.myrada.org/filmsdownload.php?filename=farm.wmv> – to download

- content**
- What is hygiene? Why is it important to maintain hygiene?**
- Hygiene is the branch of medical science that looks at how living conditions affect health, and looks at measures to prevent disease occurrence and looks at conditions that ensure preservation of health. Animal hygiene deals with laws of health pertaining to animals and concerned with the sanitary care of domestic animals. It aims at enhancing the productive lives of animals and lowering the rate of their decay with resulting increase in their longevity.

What happens with poor hygiene?

- Animal welfare depends on its immediate environment – including physical, chemical and biotic factors, housing technology, feeding and watering strategy and social aspects of ensuring individual treatment and healthcare. Unhygienic conditions include high/low air temperatures, too much/too little light, noise, chemical composition of air (build up of carbon dioxide (CO₂) and other noxious gases), excrement and grime, crowding and can result in lower productivity, illness and even self-harm (psychological condition where animals hurt themselves). Some diseases have the ability to spread to entire herds and entire regions as well.



30 mins

Aspects of good hygiene:

It is important to ensure hygiene at four different sources.

Vehicle hygiene: Where vehicles are used to bring in materials for animals or transport them, they can also carry germs and cause disease outbreaks. If animals are being transported, the vehicles should be made ready to safely carry the animals and reduce risk of injury.

Personal hygiene: animal handlers should follow hygiene practices that reduce the risk of transferring disease organisms from animal to animal and farm to farm.

Housing hygiene: Housing conditions of animals when they are in enclosed spaces and when outdoors is important.

- Build animal shelters on an open, well ventilated, well drained site.
- The floor should be non porous, non slippery and durable without being expensive, capable of being readily cleaned, washed and disinfected, and dried quickly.
- The floor and rear drain of the shed, if pervious and unsuitably made are certain to absorb moisture and foul smelling decomposition products of refuse and urine. As a result the entire sub soil of the floor becomes almost saturated with these in time. In addition such a floor will be favourable ground for the growth and multiplication of severe dangerous disease producing germs which may be transmitted to healthy animals.

- An uneven hard floor is very uncomfortable and unhealthy for animals. On wet and slippery floors, animals can fall and sustain serious injuries such as fractures, tearing and over stretching of ligaments and even abortion if the animal concerned is pregnant.
- The areas surrounding the shed should also be kept clean, or they will become the source for flies and other pests. The presence of an animal shed should not be a source of trouble for neighbours as well.

Equipment hygiene¹

- Various equipment are used on animals both during medical examination and treatment and routinely in their management – e.g. milk buckets, milkers, cleaning equipment, feeding equipment, etc. These equipments can quickly spread disease causing germs if not sanitised appropriately.

- methods**
- Lecture
 - Brainstorming and discussions
 - Film show

process Define hygiene in animal care.

Brainstorm the participants on the effects of hygiene and the lack of it.

Key Question: ‘what happens when hygiene is maintained while caring for animals?’, ‘what happens when there is lack of hygiene in the care of animals?’

Sum up the points and continue brainstorming:

Key Question: ‘what should be done to ensure good hygiene in caring for animals’

Indicative answers:

‘they should be housed in clean areas; sheds should be cleaned regularly’

‘must design the shed to make it easy to clean’

Etc.

Describe aspects of good hygiene in animal care. Use some aspects of the video on Integrated Farm Development to show clean cow sheds.

Open the floor for discussions – especially trying to understand how people in the area normally keep their animals and the levels of hygiene maintained by them. Identify good and bad practices.

- stop and check!** Participants should be able to define the term hygiene and describe ways in which animals can be kept hygienically.

.....

¹ <http://www.ecolab.com/Europe/downloads/ldi.pdf>



4-2 Healthy animals and diseased animals

- materials**
- Charts and markers
 - Pictures of disease symptoms

content Paravets must possess a key skill of identifying the health of animals by simple observation of tell-tale signs. They will not work in areas where modern equipment is readily available to make accurate diagnosis of an animal's health. Their keen use of their eyes, ears, hands and correct inquiries could yield good results.

Signs of a healthy animal	Signs of a diseased animal
▪ Eyes are bright	▪ Anxious look
▪ Mucous membrane pink and slightly moist	▪ Congested conjunctiva
▪ Skin soft	▪ Roughness of coat
▪ Healthy appetite	▪ Cessation of rumination ▪ Loss of appetite
▪ Pulse, respiration, body temperature and excretions should be normal. (see table below)	▪ Drop in milk yield ▪ Off colour ▪ Outstretched nostril ▪ Salivation ▪ Hard breathing


Vital Signs in a Healthy Animal

Animal	Pulse rate/Min	Respiratory rate/Min	Body temperature (deg F)
Cattle	45-55	12-16	101.8-102.4
Sheep	70-80	12-20	101.3-105.8
Horse	30-40	8-12	100.4-100.8
Goat	70-80	12-20	101.3-105.0
Pig	70-80	10-16	100.9-104.9
Dog	90-100	15-30	100.9-101.7
Cat	100-120	16-32	101-102
Fowl	300	15-30	105-107

General principles of animal management:

- Use fresh drinking water
- Adequate nutritional feed
- Adequate ventilation and suitable environmental temperature
- Adequate space for animal
- Sufficient light for inspection, diagnosis, treatment of injuries and diseases.

- methods**
- Brainstorming
 - Discussions
 - Lecture

- process**
- Brainstorm the participants on how they identify the health of animals.
Key Question: ‘How do know when an animal is sick? What signs do you look out for?’ Indicative answers: ‘animal has not energy’ ‘animal does not like to walk – is lying down’ ‘animal is breathing heavily’ ‘signs of any wounds, bad smells, swelling’, etc.
Describe the common signs of a healthy animal and a diseased animal.
Present the vital signs of healthy animals (show participants how to take pulse and temperatures of various animals during practical sessions).
Present the general principles of animal care and management.
Open the floor for discussions.
- 
- 30 mins**

stop and check!

The participants are able to describe the signs of a healthy versus sick animal. They can mention the vital signs of healthy cattle, sheep, goats and fowl. They can list the general principles of animal management.

4-3 Handling animals

- materials**
- Charts and markers
 - Pictures
 - Live animals
 - Videos

- content**
- Handling of animals:** Handling animals is a part of a veterinary worker’s routine job duties. Animals should be handled with minimum discomfort and injuries to the animals and the handlers; the safety of both is priority here. Animals have to be handled for routine examination, diagnosis, treatment, and transport. The handler has to be fit physically and psychologically and be skilled in handling techniques – which of course comes with practice.

- 
- 30 mins**

Everyone handling animals should be:

- Able to use the handling equipment and other safety equipment provided
- Aware of the dangers when handling animals and be supervised until they are competent
- Able to work calmly with animals, with the minimum of shouting, impatience or



- unnecessary force
- In good health and properly trained in work methods

Some dos and don'ts:

- Animals can be unpredictable, therefore remain constantly alert to their movements. Look out for animal signs of fear and aggressiveness. Be careful around animals that are new mothers.
- Animals react clearly to our movements. Regularity and consistency are very important for the animal.
- Approach the animal quickly and calmly, don't make sudden movements and don't shout. Avoid approaching from the back and the 'kick zones' of animals.
- Touch the animal often so that it will not be scared. Try to get the animals used to people as soon as possible; do not change the people who attend to the animals too often.
- Animals can be frightened suddenly by snakes, a strange person, biting insects, other animals, buckets or other strange things. Calm the animal down as soon as possible because it can hurt itself and you.
- If you want to take the cow with you or put it somewhere alone, use a firm rope and good knots.
- Before milking put a rope around the cow's neck. Tie the hind legs to each other so the cow cannot kick. This also prevents the cow from walking away.

Safety measures for the handler:

For safety on the job, veterinary workers must use protective footwear with good grip, tough clothing, and gloves. There is danger of zoonosis (diseases transmitted by animals – like bird flu/swine flu or rabies) but this is generally caused by dirty hands, inhalation of contaminated dusts, and bites. Frequent hand washing is the best defence against diseases caused by touching animal saliva and wastes. In some cases protective eyewear and respirators may also be needed for diseases transmitted by breathing contaminated farm and field dusts. If injured by an animal or potentially exposed to a diseased animal, veterinary workers should immediately seek medical assistance and report to the local veterinary department in case of disease outbreaks.

Casting is a technique of correctly restraining cattle when they need to be examined. It is necessary to throw and tie a cow/bull for certain minor operations. Remember to cast the animal in a well strawed or soft area. Use 40-50 feet of an inch rope (preferably cotton) which is soft and pliable. Loop one end around the neck and tie a rigid knot that will not slip. Take a half hitch around the chest and then around the flank (see picture) with the hitch well

down one side of the body. If you pull steadily on the free end of the rope, the animal will fall to the ground usually on the opposite side to the way the head is turned.



- methods**
- Brain storming
 - Discussions
 - Lecture
 - Demonstration
 - Video shows

process Brainstorm the participants on the basics of handling animals.

Key Questions: ‘Why should an AH Promoter be able to handle animals?’ ‘what safety precautions should be taken while handling animals?’ ‘what are the dos and don’ts while handling animals?’

Explain the need for handling animals in veterinary care and the prerequisites for handling animals.

Explain the ‘Casting’ method of handling cattle.

Demonstrate methods of handling different kinds of animals as live demonstrations, reinforced with videos – all the time stressing on the safety issues involved.

Allow participants to practice these skills during practical sessions.

Open up for discussion both in the classroom and during practical lessons and clarify any doubts.

stop and check! Participants are able to demonstrate how to handle animals for examination. They are able to describe the precautions to be taken and the dos and don’ts in handling animals.

4-4 Caring for pregnant and lactating cows, calves and heifers

- materials**
- Charts and markers
 - Pictures
 - Dehorner
 - Castrator
 - Tincture of iodine
 - Blade and thread

content **Care of cows during pregnancy and parturition:**



**1 hour
30 mins**

- Do not walk a cow for long
- Do not allow the cow to graze with crowded animals and ensure isolated place for rest
- Know the expected date of calving
- Keep the room clear, well ventilated, well bedded, and disinfected.
- If any abnormal presentation during delivery is probable (dystocia) immediately provide veterinary aid.
- If the cow suffers from constipation, give a dose of 0.6 kg of linseed oil occasionally.
- A day before the cow is expected to calve, give a mixture containing 0.45 kg Epsom



salt, 1 tablespoon of ginger and 1.7 litre water. Repeat this drench after calving

- After parturition, wash the external genitalia, flanks and tail with warm water and give the cow some warm water to drink
- If the placenta is not expelled within 8- 12 hours, apply manual help of a veterinarian. Bury the placenta immediately in a deep pit.
- At first, feed the cow only bran mash moistened with lukewarm water to provide laxative effect; green grass can be given later. Concentrate feed should then be gradually increased.

Caring for a new born calf

A calf is the offspring (in its first year) of a cow. A male is known as a bull calf, a female is known as a heifer calf.

- Immediately after the calf is born, make sure that all mucus is removed from the nose and mouth. If the calf does not start to breathe, lay the calf on its side and provide artificial respiration by alternately compressing and relaxing the chest wall with your hands
- Apply tincture of iodine to the navel at birth and dust the area with boric acid powder. If a long cord is attached to the navel, snip it off about 2'' from the body before applying iodine
- Under most conditions the calf will be on its feet and ready for suckling within an hour. Some assistance at this stage is useful
- Calf should be able to get its first milk (colostrum) at least for 48 hours. The antibodies present in the colostrum protect the calf against disease and it has a laxative effect. The rate of milk feeding should be about 10% of the calf weight per day (1/10th of the body weight)
- Identify the calf by tattooing
- Extra teats beyond the normal four are unsightly and should be removed when the calf is between one and two months old
- Dehorn the calf at an early age - preferably within 15 days
- Castrate the bull calf with help of a Burdizzo's castrator
- Prevent and control diseases like white scours, common scours, pneumonia, ringworm, and different internal parasites.
- When the calf is 3 months old, vaccinate against Anthrax and 15 days later vaccinate against Black Quarter.

Management of Heifers

Heifer is a bovine female less than three years of age who has not borne a calf.

The dairy farmer must provide optimum feed, environment and care for proper growth and development of heifers to mature and breed them early.

1. Age of separation: Calves irrespective of sex can be raised together up to 6 months age and then separated sex-wise for their proper growth and development.
2. A. Outdoor system: Heifers under outdoor system are reared chiefly on grazing.
B. Indoor system: Heifers under indoor system are managed in yards with enough shade. Legume hay rich in protein, minerals, and vitamins may be fed free of choice. Amount of hay or green forage will depend upon forage quality, succulence, and palatability, and age and size of heifer.
3. Steaming up: Feeding grains to pregnant heifer prior to calving at 1.5 kg/day helps in their growth, producing more milk after calving and increases lactation length.
4. Age of breeding and calving: Under good management conditions breeding age of Indian breeds is 2-2.5 years and crossbred heifer is 1.5-2 years. Accordingly, first calving age is 3-3.5 and 2.5-3 years respectively.
5. Training the Heifers: a month before calving house pregnant heifers along with milking cows, and wash the udders with warm water and mop with duster to accustom them to feel hands in this place. Just a few days before calving practise pulling the teats slightly so that after calving heifers remain docile and will not get excited.
6. Exercise: Heifers managed under outdoor system need no extra exercise but those kept indoors need a little open area in front of the pen to give freedom of movement for exercise as it keeps them thrifty and maintains normal appetite.
7. Control of parasites: de-worm heifers at 4-6 months interval. Regular grooming and periodically rubbing malathion or Leucas aspera (juice 500 ml kept in the direct sunlight and 2 gm of camphor is added and the same is applied once in the evening. Use Leucas aspera plant to scrub the body of the animal during bathing), dust in to their hair will help in preventing of ectoparasite infestations.
8. Vaccination: At 6 months of age vaccinate heifers for Foot and Mouth, Tuberculosis, and Rinderpest diseases.

- methods**
- Lecture
 - Interaction
 - Display of equipment
 - Demonstration

- process**
- Present the key aspects of care for pregnant and lactating cows, calves and heifers.
Display equipment used for delivering calves, dehorning and castrating young calves.
Open the floor for discussion and clarify doubts both in the classroom as well as in the field.

- stop and check!**
- Participants should be able to explain the key steps in caring for pregnant and lactating cows, cows during parturition, calves and heifers. They should be able to describe the use of equipment like a dehorner and castrator.



4-5 Clean milk production

materials ▪ Video

content **Introduction:**

Most farm families like to keep milch cattle. However keeping milch cattle is one thing, and producing clean milk is another.

Why clean milk?

Milk and milk products are good for the health of every member of the family (young and old). But milk should be clean - unclean milk causes illness and poor health. Also milk is a perishable commodity. Unclean milk gets spoiled quickly and fetches a low price in the market or may be unsalable.

What is clean milk?

Milk is clean when it doesn't contain any harmful bacteria and/or foreign matter, such as dust, cow dung, hair, flies, etc. Producing clean milk requires a clean environment and premises, clean containers, clean milking habits and finally clean and healthy milkers.



1 hour

Clean environment and premises:

- Keep the cowshed well ventilated. The floor should be made of smooth concrete or brick and should have a drain. Smooth ceilings and walls help keep the shed clean.
- Clean and disinfect the floor and the drains with water, using 2 % phenyl after milking.
- Periodically, white wash the ceilings and walls.
- Avoid feeding the animal (fodder, straw) immediately before milking as these can raise dust.

Clean containers:

- Use only clean utensils for collecting milk.
- Clean all milk utensils promptly after use.
- Clean the utensils with warm water using an alkali washing powder (Sodium hypochlorite)
- Use clean water for washing milk utensils.
- Use a narrow mouthed seamless pail for milking.

Clean animals:

- Before milking, wipe the animal's udders, flanks, and tail with a clean cloth
- Clean the udder and teats with warm water (add potassium permanganate to the water)
- Wipe the udder and teats dry with a clean rough cloth after washing.
- Tie the tail of the animal to its hind legs during milking.

Healthy animals:

- Ensure that the milch animal is healthy and free from diseases communicable to people. Tuberculosis and other diseases can spread through milk.
- Examine the animal's udder every day for cracks. Treat these with antiseptic ointment.

Clean milking:

- Wash hands and arms with soap thoroughly before milking.
- Trim fingernails short
- Wear clean clothes
- Cover head to prevent hair falling into the milk.
- Milk the animal using the full hand method. The thumb should not be pressed inward; the knuckle should not press against the teat.

Healthy milkers:

- The person milking the animal should be healthy.

Clean milk storage:

- Aluminium or stainless steel cans with tight lids are good for storing and transporting milk.
- Cover the milk with a cloth to keep out dust and flies.
- Don't keep the milk in direct sunlight as the taste of the milk changes and some vitamins are destroyed.
- To keep milk cool, place milk cans in a tub containing cold water.
- Don't mix fresh milk with old milk.
- Wash and clean empty milk vessels immediately after use.

Clean milk production will help to avoid unnecessary financial losses through spoilage of milk.

- methods**
- Brainstorming
 - Video
 - Lecture
 - Demonstration

process Brainstorm on the need for clean milk production.

Key Question: 'why does milk spoil?' 'what do you think is happening if milk always spoils in a particular farm?'

Indicative Answers: 'the weather is hot', 'the farm is not clean – so milk spoils'

Explain what is meant by clean milk production and why it is needed.

Describe the steps in clean milk production.

Relate the session with the content on hygiene on the farm – clean vehicles, clean handlers, clean equipment and clean housing.

Demonstrate the correct methods of washing hands and vessels, milking.

Open the floor for discussion.

stop and check! Participants are able to define the term clean milk production. They are able to describe the steps to ensure clean milk production. They can demonstrate correctly clean milk production processes.





4-6 Special care for bullocks and buffaloes

materials ▪ Presentation slides

content **Managing Bullocks:**

Bullocks are still the main source of motive power in agricultural operations. They are used for ploughing, threshing, harvesting, lifting water and transporting people and agricultural produce. Their care is important to the local economy.

A good bullock should be of good size, height, and length. The animal must have an easy natural gait and good pace. A thick and muscular neck indicates heavy draught capacity. A tight skin is generally considered to denote great sensitivity and fiery temper, as in some South Indian draught breeds like Amritmahal, Kangayam and Hallikar.

Animal power is a renewable energy source that is particularly suited to family level farming and to local transport. Animal power is generally affordable and accessible to the small holder farmers who are responsible for much of the world's production. The availability of animal power allows women and men to increase their efficiency and reduce their drudgery, compared with manual alternatives. Bullocks can be fed as given below:



30 min

- For maintenance: 1.5 kg concentrate feed per animal per day
- 4 hours ploughing/ 6 hours bullock cart travelling: 2.5- 3 kg concentrate feed/animal/day
- 6 hours ploughing/8 hours bullock cart travelling: 3.5- 4 kg concentrate feed/ animal/day + 30 gm salt+ 30 gm mineral mixture+10 kg green fodder+ 5 kg straw/dry fodder

Managing buffaloes in summer:

Buffaloes are hardy animals, but constant exposure to high ambient temperatures can lead to a rise in rectal temperature, reduced feed intake, increased water intake, decreased milk production, changes in milk composition (reduction in both fat and solids non fat), reduced growth rate and even loss in body weight and lowered fertility. Animals graze and eat less during day time in summer and tend to eat more during night. To reduce heat stress in summer, protect the buffalo from exposure to direct sun for long periods. If possible take them to ponds for wallowing. Do not allow buffaloes to roam in the open or graze in the fields between 11 am and 4 pm when the sun is most intense. Grazing the buffalo outdoors late afternoon (after 5 pm) may be better; even night grazing can be practiced.

methods ▪ Brainstorming
▪ Lecture

process Brainstorm the participants on the importance of bullocks and buffaloes

Key Question: 'what is the importance of bullocks and buffaloes in rural economy?'

Indicative answers:

- Draught power

- Milk production
 - Necessary for agriculture
- Supplement the responses with content.
Explain the special care required by buffaloes and bullocks.
Open the floor for discussions and clarify issues.

stop and check! The participants are able to describe the key aspects of managing draft animals like bullocks and buffaloes.

4-7 How weather affects livestock

materials

- Charts and markers
- Pictures

content Much of the content below is taken from IIRR (1996) Environmentally Sound Technologies for Women in Agriculture. Cavite.

Disease severely affects animal production and reproduction leading to economic losses. Many animal diseases are environmentally induced. Climate is a combination of several elements such as environmental temperature, humidity, air movement, and solar radiation and affects livestock.

Heat stroke

When external temperatures are very high (over 40° C), and animals are kept outside either working or grazing or overcrowded in badly ventilated shelters, they can suffer from heat strokes. This is especially true for poultry kept in asbestos sheet and tin roofs that tend to get overheated in very hot weather.

Symptoms

At first, animals pant and search for water; their body temperature goes up very high; then they have trouble breathing, stop urinating, collapse, and in severe cases, die.



30 min



High temperature causes-

- A rise in its rectal temperature
- Decline in feed intake
- Increase in water intake
- Decrease in milk production
- Changes in milk composition
- Reduction in growth and loss in body weight
- High mortality among newborn, especially new born lambs

Prevention

Do not allow animals to work or graze during the day in summer when it is very hot. Work and graze animals during early mornings or late evenings. Allow the animals access to plenty of water, salt, and shade. Do not overcrowd animals in shelters. Design animal houses so that ventilation is adequate in hot weather. Insulate roofs with straw or other agricultural residue to prevent overheating. Allow buffaloes to wallow.

Treatment

When the animal's temperature goes very high, cool the animal with packs made by soaking strips of cloth in cold water. Give the animal plenty of fluids to drink, such as tamarind juice, sugar cane juice and coconut water. Or, make oral rehydration drink by mixing 4-5 teaspoons of sugar and $\frac{1}{4}$ teaspoon of salt in each litre of water. Move the animal to comfortable surroundings with plenty of shade and ventilation.

Coughs and colds

Extremely cold weather or a combination of cold and wet weather can lead to various disease conditions, the simplest of which are coughs and colds. This lowers the resistance of animals and makes them susceptible to more serious conditions such as haemorrhagic septicaemia and ephemeral fever (or three-day sickness).

Symptoms

Shivering, discharge from nose and eyes, coughing, possibly accompanied by high fever. The animals huddle together, and are very slow to move.

Prevention

Avoid exposing animals to cold wind and rain. Provide adequate and comfortable animal houses, and dry bedding in wet and cold weather.

Treatment

Make surroundings comfortable. Rub wet animals dry. Rub chest with turpentine liniment, camphorated oil, or eucalyptus oil. Give animals nourishing, warm food - like gruel made of wheat or finger millet flour with lots of jaggery. If animals do not show signs of improvement in 12 hours, seek professional help.

- methods**
- Brainstorming
 - Lecture

process Brainstorm the participants on the effects of extreme weather on animals.
 Key Question: 'what happens to animals when it is too hot?' 'what happens to animals when it is too cold?'
 Describe the effects of weather and indoor and outdoor climate on animals.
 Describe the symptoms of heat stroke on animals and explain the prevention and treatment of the same.
 Discuss the topic and provide clarifications.
 Describe the symptoms of colds and coughs on animals and explain the prevention and treatment of the same.
 Discuss the topic and provide clarifications.

stop and check! Participants should be able to describe the effects of extreme weather on animals. They should correctly describe the symptoms, prevention methods and cure for heat stroke and colds and coughs in animals.

4-8 Determining the age of ruminants

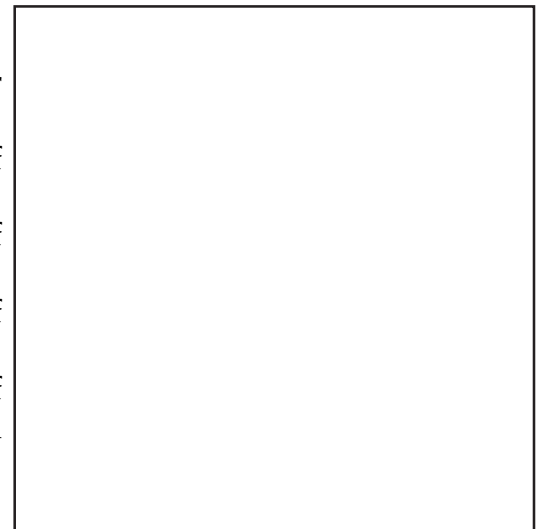
- materials**
- Pictures
 - Live animals or models of ruminant teeth

content **Determining the age of cattle (and other ruminants):**
 Refer the pictures below to understand how lower teeth determine the age of cattle (and other ruminants). The incisors are absent from the upper jaws of all ruminants. The incisors in the lower jaw are slightly movable in a direction, canines are absent in all ruminants. The incisors are described as centrals, first intermediates, second intermediates and corner incisors.



30 min

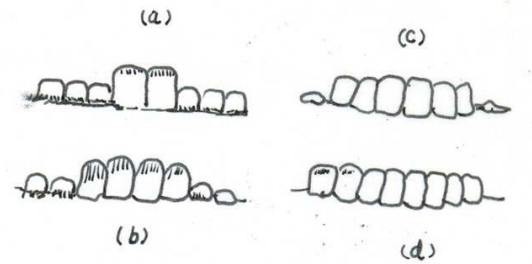
- Temporary incisor teeth
- At 1 year 6 months -loss of central pair of temporary incisors
- At 1 year 10 months: Appearance of central pair of permanent incisors
- At 2 year 6 months –Appearance of second pair of permanent incisors
- At 3 years- Appearance of third pair of permanent incisors
- At 3 year 6 months –Appearance of fourth pair of permanent incisors (full mouth)





Similarly for Sheep and Goats:

- a) At 1 year-appearance of first pair of permanent incisors
- b) At 1 year 10 months – Appearance of second pair of permanent incisors
- c) At 2 years 3 months – Appearance of third pair of permanent incisors
- d) At 3 years – Appearance of fourth pair of permanent incisors (full mouth)



methods ▪ Presentation
 ▪ Demonstration

process Present the method to determine the age of ruminants – briefly
 Demonstrate the method on the field with live animals – also showing the correct way of handling the animal to do so.
 Allow participants to practise these skills, providing timely feedback on correct and incorrect practices
 Open up for discussion both in the classroom and during practical lessons and clarify any doubts

stop and check! Participants are able to correctly determine the probable age of ruminants – (by examining the teeth of these animals)

notes for the field visit

This module requires demonstrations and practice session on the field for effective learning. Prepare for the field work in advance, keeping all equipment ready and bringing in all the required types of animals. The participants should have sufficient time and opportunity to practice various skills. Take adequate safety measures during these demonstrations and practice sessions – see that you practise all the safety requirements too.

Feeding animals

module aim Resource poor livestock holders have to balance the objectives of maintaining livestock quality and performance with the available resources at their disposal. Since many of them also live in areas where the climate creates constraints on the availability of fodder, preservation of fodder is important. Many such people also have low access to quality grazing grounds. Given these constraints, practical solutions for optimum nutrition of livestock are important. The purpose of this module is to orient participants to the basics of animal nutrition and on techniques to concentrate feeds locally and thereby cut costs.

learning objectives At the end of this training module participants will be able to:

- Define components of animal nutrition
- Explain the importance and classification of feedstuffs
- Describe the processes of digestion and absorption of feed in simple stomached animals and ruminants
- Describe fodder storage and processing
- Explain feed ration formulation for cattle

module summary

Session Title	Duration
1. Animals feeds	1 h
2. Digestion and absorption of feeds	30 min
3. Storing fodder	2 h 30 min
4. Ration formulation	1 h
Total	6 hours

materials Charts and markers, pictures, fodder specimens, samples of hay and silage, materials for preparing feed concentrates

handouts Nutrition charts and feed concentrate table

methods Brainstorming, discussions, lectures, presentation, demonstration, exhibition

field visit Visit to a farm to see fodder production

note to the trainer



Keep materials ready for demonstrating the preparation of concentrate feeds



5-1 Animal feeds

- materials**
- Charts and markers
 - Fodder specimens

content **Importance of feed and fodder**

Body processes require energy and it is obtained either by eating food or from energy stored as fat in the body. Animals spend most of their waking time looking for food. Animals will struggle to get the minimum food for survival. Wild animals eat a wide variety of food to obtain proper nutrients while domestic animals must depend on their owners/handlers to provide their balanced diet. Nutrients required are water, proteins, carbohydrates, fats/lipids, vitamins and minerals. Foods lacking nutrients in the required quantity can lead to malnourishment and ill health to animals. Feed and fodder play a major role in ensure the animal health reproduction and production of milk, meat, egg, wool, etc.



**1 hour
30 mins**

Classification:

Livestock feeds are generally classified according to the amount of specific nutrients in the ration. They are divided in to two classes - roughages and concentrates.

Roughages:

Roughages are bulky feeds containing relatively large amount of less digestible material and more crude fibre content (more than 18%)

1. **Succulent Feeds** usually contain moisture from between 60-90%
 - Leguminous – cowpea, cluster bean, berseem and lucerne
 - Non leguminous- sorghum, maize, grasses
 - Tree leaves – agathi (*Sesbania grandiflora*) - flax, subabul
 - Roots and tubers – tapioca, turnips, carrot
2. **Dry Feeds** usually contain moisture from 10- 15 %
 - Hay - a grass that has been mown and dried for use as fodder
 - Straw – consist of stems and leaves of plant after removal of ripe seeds by threshing
 - Others – corn cobs, cotton seed hulls, sugarcane bagasse

Concentrates:

Concentrates are feeds which contain relatively smaller amount of fibre (less than 18%) and high digestibility and as a result higher nutritive value

1. **Energy Feeds**
 - Cereal grains, e.g., maize, sorghum, barley, bajra, etc.
 - Milling byproducts e.g., wheat bran, rice bran, etc., and molasses
 - Animal and vegetable fat

2. Protein supplements

- Oil meal/oilcakes – ground nut oil meal, soybean oil meal, coconut meal, mustard cake, cottonseed cake, sesame meal, etc.
- Animal protein supplements – fish meal, meat meal, blood meal, feather meal, hatchery waste
- Brewers dried grains- barley
- NPN- supplements which contain nitrogen in a form other than protein are termed as Non Protein Nitrogen - e.g., ammonium acetate, ammonium bicarbonate, ammonium carbonate, urea.

- methods**
- Brainstorming
 - Lecture
 - Exhibition

process Brainstorm on the importance of food for animals.

Key Question: ‘Why is food important to animals? How do they get them?’

Explain the components of food (macro and micronutrients) and why farm animals need fortification or diversity in their foods.

Brainstorm on the types of food.

Key Question: ‘What are all the different types of feed and fodder are giving to livestock?’

Indicative answers:

- Grass
- Straws of sorghum, ragi, paddy
- Concentrate feed from the market

Classify food and fodder and list out the various materials under each class.

Display samples of different fodder and feed materials.

Open the floor for discussion and clarify doubts if any.

note to the trainer

	If possible arrange a field visit to see different varieties of fodder on the field and in feed mixing units.
--	---

stop and check! Participants are able to explain the need for food, classify feed and list materials under different classes of feed.

.....



5-2 Digestion and absorption of feed

- materials**
- Charts and markers
 - Pictures

content **What is digestion?**

Digestion is a series of complex events where bulky and complex food is broken down to release various nutrients into absorbable form. The processes of digestion differs between animals – especially between simple stomached and ruminant animals.

Simple stomached animals: (e.g., dog, pig, horse)

- Digestion is mostly due to enzymes
- Saliva contains the enzyme amylase which can digest starch
- Food from the mouth passes on to the stomach where enzymes such as pepsin, lipase and rennin act on it.
- Food subsequently passes into the small intestine where most of the digestion takes place with the help of enzymes secreted from pancreas and bile from liver
- Small and large intestines are also the organs where most of the absorption of the digested feed takes place.



**1 hour
30 mins**

Ruminants: (e.g., cattle, sheep and goat)

- Ruminants have an enlarged fore-stomach comprising of four compartments - Rumen, Reticulum, Omasum and Abomasum
- Rumen is the first compartment and works as a store and fermentation vat; it also absorbs some of the digested nutrients
- The Rumen

enables regurgitation and remastication of feed, so that fibrous materials are reduced to small pieces enabling microbial action. The coarse material eaten mostly comprises of cellulose and other higher polysaccharides, which are attacked by the microbes and converted to fatty acids, which are the main source of energy for ruminants. This is generally a mixture of acetic, propionic, butyric and valeric acids. The protein as well as non protein nitrogenous material are mostly converted in to ammonia and utilised by the microbes for microbial protein. Excess ammonia is absorbed and is recycled by excretion through saliva in the rumen. NPN compounds are utilised by the ruminants and the amino acid requirements are met with. The fats are also converted in to fatty acid and are subsequently absorbed.

- methods**
- Lecture
 - Discussion

process Describe why animals are classified into simple stomached and ruminants.
 Describe with pictures and presentations the working of a simple stomach in digesting food.
 Describe with pictures and presentations how ruminants eat and how food passes through various stomach chambers in a ruminant stomach.
 Instruct participants to make an illustrative sketch of the two stomachs – showing the direction (uni- or bi-directional) of food flow in these stomachs.
 Open the floor for discussions and clarify the processes if required.

stop and check! Participants are able to differentiate between the working of a ruminant stomach and a simple stomach. They can draw a basic illustrative sketch of the simple and ruminant stomachs.

5-3 Storing fodder

- materials**
- Charts and markers
 - Pictures
 - Samples of hay and silage
 - Silage making materials

content Green fodder availability is seasonal. Therefore, surplus fodder produced during peak seasons must be conserved in some form without affecting the nutrient content and palatability much, for use in the lean season. This is called fodder preservation.

Conservation of forage and processing of crops: There are two ways of storing fodder - Hay making and Silage making (ensiling)



**2 hour
30 mins**

1. Hay – is the conversion of green forage into dry form without affecting the quality of the original material, to safely store it for fairly long periods. The hay thus produced and stored can be used regularly and also during lean seasons to tackle fodder scarcity.
2. Silage – is green fodder preserved in its succulent state by packing fresh fodder and allowing it to ferment under anaerobic conditions without undergoing much loss of nutrients. The process of making silage is called Ensiling.



Hay Making	Silage making (Ensiling)
<p>Harvesting the grass or other crops at the proper stage, and drying the material in a controlled manner, so that the moisture is lost without over exposure to sun. The moisture in the material should be reduced to 15- 17% for safe storage</p> <p>Qualities of good hay:</p> <p>Good quality hay should retain a larger proportion of leaves, have green colour, pleasant aroma and optimum moisture content and free from moulds.</p> <p>Crops suitable for hay making: All thin stemmed grass and legume forages are suitable for hay making. Cereals like oats and sorghum, grasses like guinea, thin napier and legume fodder crops like berseem, lucerne, cowpea, and cluster bean are suitable for hay making</p>	<p>Grass material is stored through anaerobic fermentation which prevents putrefaction. For ensiling cereal crops and grasses are best suited. The material should be chopped into small pieces and tightly packed in pits, and properly covered. During ensiling the material can be supplemented with molasses</p> <p>Qualities of good silage:</p> <p>Good quality silage should be greenish or yellowish brown, with acidic taste and pleasant odour and without mildew.</p> <p>Crops suitable for silage making: Fodder crops like maize, sorghum, bajra, and grasses like Cumbu napier, guinea, and para are highly suitable for silage making. Leguminous fodder which have high crude protein and low soluble carbohydrate are not considered fit for silage making.</p>

- methods**
- Lecture
 - Discussion
 - Demonstration of silage.

process Explain why fodder preservation is important in livestock development.
 Classify different methods of fodder preservation.
 Describe the processes of making hay and silage.
 Describe the qualities of good hay and silage – using pictures and samples. Contrast with bad quality hay and silage samples as well.
 Allow participants to handle and sense the samples.
 Open the floor for discussion and clarify doubts if any.

stop and check! Participants will be able to explain the need for fodder preservation. They can classify different methods of fodder preservation.
 Participants can explain the processes of hay making and ensiling and describe the qualities of good hay and silage.



5-3 Ration formulation

- materials**
- Chart
 - Marker
 - Raw materials for preparing concentrate feeds

content Feeding of animals needs a planned, scientific, practical, and economical approach to achieve high production and animal welfare. Ration formulation concerns the aspects of providing balanced feed to animals according to their type, age, reproductive status and utility. For poor livestock holders feeds available include natural grazing, cut and carry indigenous grass species from road sides, waterways and fields, crop residues, locally occurring feedstuffs and forage crops suitable for small scale production. A feeding calendar should be a routine management tool as many of these resources are scarce and seasonal. Concentrated feeds are usually expensive – but can often be made locally to cut costs. The intake depends on the following factors:

- Amount of feed offered (which depends on availability and cost) and its TDN - Total Digestible Nutrients and DCP - Digestible Crude Protein
- Palatability of feed
- Imbalance of specific dietary nutrient
- Physiological state of the animal (e.g. maintenance, lactation, pregnancy, recovery from disease)

Low intake leads to loss of production, failure to reproduce and death in young and ill animals. Appropriate feeding is therefore necessary.



**1 hour
30 mins**

How to prepare concentrate feeds

For low producing and slow growing animals, the nutrients in roughages are sufficient if they are fed in proper ratio. However for high producing animals, since their requirement for nutrients is high, all of them cannot be supplied through roughages. Hence they are supplied through feed stuff which have high concentration of these nutrients, these feed stuff are called concentrates.

Ingredients in concentrate feeds are divided into three categories namely:

Rich energy and low in protein E.g., cereals like maize, jowar, bajra, etc.

Protein rich feeds E.g., oil cakes

Medium in protein and energy. E.g., bran

For preparing a concentrate mixture, ingredients mixed in the following manner to prepare 100 kg mixture:

Grains	30-40 parts
Oil cakes	15- 30 parts
Bran	25- 45 parts
Minerals and vitamins	1-2 parts
Iodised salt	0.5- 1 part



Feed requirements for cattle:

Maintenance ration for heifer:

The DCP and TDN requirement of such animal (250 kg) would be 0.17 and 2.05 kg respectively. The dry matter intake would be around 6 kg to meet the maintenance requirement of the animals

Sl No.	Feed	Animal Weight	
		250 kg	200 kg
1.	Green Legume	6 to 8 kg	18 kg
	Cereal Straw	4.5 kg	2 kg
2.	Concentrate mixture	1 kg	2.5 kg
	Cereal straw	5 kg	4.4 kg

Combination of about 6-8 kg of leguminous green fodder and 4.5 kg of straw can easily meet the maintenance requirement of the animals. If green fodder is not available about 1kg of concentrate mixture should be given with 5 kg of straw.

Animal weighing 200kg would consume about 5 kg of dry matter and need 0.42 kg DCP and 3.2 kg TDN. If green fodder is not available, about 2.5 kg of concentrate mixture and 4.4 kg of straw should be given.

Maintenance ration for milch cattle:

Combination	Feed	10 kg milk production	5 kg milk production
		Quantity kg	Quantity kg
1.	Green Legume	15	10
	Green Cereal	25	20
	Cereal Straw	2	4
	Concentrate mixture	1	-
2.	Concentrate mixture	7.5	3.5
	Cereal straw	4.5	7.0

If 30-40 kg of green fodder is available per animal it is possible to produce more than 5 kg of milk even without concentrate mixture. If sufficient greens are not available the ration has to be supplemented with concentrate mixture and the cost of feed would be higher

note to the trainer

Modify the contents of this session to suit the types of animals that your participants would be dealing with.

- methods**
- Lecture
 - Demonstration
 - Discussion

process Explain the need for ration formulation in livestock rearing.
 Describe how various characteristics of feed material and the animal condition can affect feed intake.
 Demonstrate the preparation of concentrated feed. Allow participants to help you in the process. Support participants to use weighing scales and measuring equipment accurately. Demonstrate correct mixing movements.
 Explain sample feed rations for heifers and lactating cows (or any other type of livestock that is common to your area).
 Open the floor for discussion and clarify doubts if any.

stop and check! Participants are able to explain the need for ration formulation in livestock rearing. They can list and explain the factors that affect the intake of feeds in different animals.
 Participants can demonstrate the process of making concentrated feeds. They can explain the maintenance rations for heifers and lactating cows.

Sum up the module on animal nutrition – recap key points in each session and why animal nutrition is a key challenge when working with resource poor livestock holders.

resources IIRR (1996) Environmentally sound technologies for women in agriculture. Cavite. - see sections on community pasture management, cattle feeding, make hay to preserve fodder, make silage to preserve green fodder, urea-molasses mineral lick.





Oestrus cycle

module aim Success of animal husbandry activities depends on effective breeding and maintaining the productive population of livestock herds. Detecting animals in oestrus and providing timely breeding services whether using sires or artificial insemination determines the success of the farm. This module aims to elaborate on the phases of the oestrus cycle, symptoms and period of oestrus cycle and activity of hormones related to breeding of animals. The ability to understand the oestrus cycle will give us a better understanding of reproductive management and the control of the oestrus cycle. The ability to control the oestrus cycle also can increase the percentage of cows/ewes/dogs that conceive at the beginning of a breeding season.

learning objectives At the end of this training module participants will be able to;

- Define oestrus cycle, describe its phases and duration
- Describe symptoms of heat
- Explain the role of hormones related to breeding

module summary

Session Title	Duration
1. Oestrus cycle and its phases	45 m
2. Symptoms of heat	1 h
3. Hormones in animal breeding	45 m
Total	2 hours 30 min

materials Charts and markers, pictures, videos

methods Brainstorming, discussions, lectures, presentations, video shows



6-1 Oestrus cycle and its phases

- materials**
- Charts and markers
 - Pictures

content Animal breeding is the process of using the genetic makeup of an animal and the physiology of reproduction to improve animals. The purpose of animal breeding is not to genetically improve individual animals but to improve whole animal populations. Some animals have inbuilt capacity to cope with environmental stresses of climate and disease or produce large amounts of milk or have good mothering abilities. Humans have historically bred animals to enhance desirable qualities in animals by careful selection of breeding stock. Understanding an animal's reproductive cycle is essential for a successful breeding programme. Also in a farm, the percentage of cows that become pregnant during the breeding season will directly affect its productivity.

Definition of Oestrus Cycle: Simply put, the Oestrus Cycle or Heat Cycle is the periodic cycle that a female animal's body goes through to produce eggs; in a cow this takes about 21 days. The oestrus cycle is a dynamic process. There are chemicals in the ovary of the animal which enable the growth and development of follicles, which are fluid filled bubbles (blisters) that hold the egg and release a hormone called oestrogen. Hormones also help create a body called corpus luteum which is essential to establish and maintain pregnancy. During the oestrus cycle in animals three changes happen – release of different hormones, changes in the structure of the animal's reproductive tract and changes in the animal's behaviour. The oestrus cycle takes place between two successive events of 'standing heat' – when the female animal is sexually receptive. The oestrus cycle has four phases.



45 mins

Phases:

- **Pro-oestrus:** It is an ill defined period during which the Graafian Follicle is growing under the influence of Follicle Stimulating Hormone (FSH) and producing increasing amount of the hormone oestradiol
- **Oestrus:** Oestrus is a fairly well-defined period characterised by sexual desire and the acceptance of the male by the female domestic animal.

Oestrus cycles in different animals

Animal	Pro-oestrus In days	Oestrus In hours	Metoestrus In days	Dioestrus In days
Cow	3	12-24	3-5	13
Mare	3	4-7	3-5	6-10
Sow	3	2-4	3-4	9-13
Sheep and Goat	2	1-2	3-5	7-10
Dog	9	9	-	-

- **Metoestrus:** Metoestrus is a poorly defined period following oestrus during which the corpus luteum grows rapidly from the granulosa cells of the ruptured follicle under the influence of the luteinising hormone secreted by the anterior pituitary. At this point it is too late for insemination. In case the egg was fertilised, it will get released into the uterus in this period.
- **Dioestrus:** Dioestrus is the longest period of the oestrous cycle, the Corpus Luteum (CL) is fully grown and the effects of progesterone on the reproductive tract are marked. In case the cow is pregnant, the fertilised egg would have lodged in the uterus by now. If not, the CL would begin to regress.

methods ▪ Presentation
▪ Discussion

process Explain the importance of animal breeding in maintaining healthy and productive populations of animals.
Define the oestrus cycle in animals and why it is important to understand the cycle in animal breeding.
Describe the various phases in the oestrus cycle of cattle and other livestock using if possible animated presentations.

stop and check! Participants are able to define oestrus cycle and why it needs to be understood for better animal breeding. Participants are able to explain the different phases of oestrus cycle in livestock.

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6-2 Symptoms of heat

- materials**
- Charts and markers
 - Pictures

content **What is heat?** Heat is defined as the short period in which a female animal is sexually receptive. Once sexual maturity is reached, cows will come into heat every three weeks and therefore present a chance to become pregnant. The surest sign of heat is when the animal allows other animals to mount her while she remains standing (known as 'standing heat').



1 hour

Symptoms of heat:

Cattle:

1. Stands to be ridden
2. Bellowing frequently
3. Nervous and excitable
4. Rides other animals
5. Off feed and milk
6. Vulva moist and red
7. Clear mucous discharge
8. Frequent urination

Sheep and Goats:

1. The Doe/Ewe becomes restless, shakes the tail, dislikes to eat/feed properly
2. Sudden drop in milk yield
3. Swelling and slight reddening of the genital opening.
4. Mounting on other goats/sheep

- methods**
- Lecture/presentation
 - Brainstorming and discussions
 - Videos (see links at the end of this module)

process Define and explain the term heat.

Brainstorm the participants on the symptoms of heat.

Key Question: 'have you seen a cow in heat – what are the symptoms of a cow in heat?'

Explain the symptoms of heat in cattle and sheep and goats – using pictures and videos.

Describe why accurate identification of heat is necessary to successfully breed animals.

stop and check! Participants are able to explain the symptoms of heat in cattle and sheep and goats.



6-3 Hormones in animal breeding

- materials**
- Charts and markers
 - Pictures

content Hormones are chemicals released by cells in a specific area of the body which affect cells in other parts of the body; in animals hormones are transported through blood. E.g., insulin is a hormone released by the pancreas but affects how food is absorbed in the liver and muscles. Reproduction in animals depends on the activation of several hormones. In female livestock the following hormones play a key role.



45 mins

1. Follicle stimulating hormone (FSH) - Stimulates follicle growth in the ovaries of female animals and sperm development in testes of male animals.

2. Luteinising hormone (LH)

- It prevents the maturation of further Graafian Follicles and thus prevents the occurrence of further oestrus period until the end of the current period
- It is essential for the implantation of the fertilised egg



- Development of Corpus Luteum (CL) - secretes the female sex hormone progesterone, it is essential for maintenance of pregnancy. If the animal fails to conceive, the CL decreases in size, becomes pale in colour and the tissue inside becomes fibrous known as corpus albicans

- In male animals, LH promotes the

development of cells that release testosterone, the male sex hormone

3. Oestrogen: Stimulates growth and function of reproductive tract, stimulates uterine contraction, and promotes mammary gland duct growth with proper combination of oestrogen and progesterone.

4. Progesterone: Prepares the uterus for implantation of fertilised ovum, stimulates endometrial secretion for retention of the embryo in the uterus. Due to the presence of progesterone further maturation of follicles and ovulation are inhibited. It also induces the uterine glands of the endometrium to secrete uterine milk essential for embryonic nutrition

5. Prolactin: It promotes lactation



methods ▪ Lecture and presentation

process Brainstorm the participants on the role of hormones in various physiological processes.
Key Question: 'what are hormones? Give some examples of hormones... what do they do in the body?'
Define the term hormone. List some common hormones in humans and their functions.
Explain the role of hormones in animal breeding. Describe in detail the functions of FSH, LH, Oestrogen, Progesterone and Prolactin.

stop and check! Participants are able to define the term hormone. They can list the key hormones in animal breeding and their respective roles.

resources The Bovine Estrous Cycle: <http://agbiopubs.sdstate.edu/articles/FS921A.pdf>: FS921A – George Perry, Extension Beef Reproduction Management Specialist. University of South Dakota
The Dairy Cow Heat Cycle: Patrick D. Burns, Ph.D., Colorado State University
<http://www.cvmbs.colostate.edu/ilm/proinfo/cdn/2002/Heat%20CycleSep02.pdf> (this document uses simpler language)
<http://www.ilri.org/html/trainingMat/diagnosis/cover.htm> - this is an excellent and accessible presentation on detecting heat and pregnancy in cows
<http://animalsciences.missouri.edu/reprod/video/cowheat.mov>

Artificial insemination

module aim Artificial Insemination, especially for cattle, has become a routine practice in dairy development in the country. Most of the cross breeding programmes for dairying rely on the timely availability of AI services – even in remote areas. The purpose of this module is to familiarise the participants with artificial insemination technique and pregnancy diagnosis in cattle. Using AI techniques requires highly developed and practiced skills. The Paravet training only introduces participants to AI – most participants also seek specialised training in AI provided periodically by the state milk marketing federation, where participants are given one month class room training followed by three months of internship at a veterinary dispensary.

learning objectives At the end of this training module participants will be able to:

- Define Artificial Insemination in livestock
- List the advantages and disadvantages of AI vs. natural services
- Describe parts of the Artificial Vagina
- Describe the processes of collection, dilution, examination and freezing of semen
- List and explain AI techniques
- Explain the importance of and procedure of pregnancy diagnosis through rectal examination

module summary

Session Title	Duration
1. What is AI?	30 min
2. Advantages and limitations of AI	1 h
3. Collection of semen	2 h 30 min
4. AI techniques	1 h
5. Pregnancy diagnosis	1 h
Total	6 hours

materials Charts and markers, pictures, videos, AI equipment – container, scissors, straw, thawing cup, AI gun

methods Brainstorming, discussion, lectures, presentation, video show, demonstration, guest lecture

guest lecture Local veterinarian

field visit Semen collection centre and Veterinary Dispensary

note to the trainer



This session is best held at a place where Artificial Insemination services are being provided – either at a veterinary health centre or the local milk union which provides the cold chain for AI services. Both semen collection and storage and AI should be shown.



7-1 What is artificial insemination?

materials ▪ Charts and markers

content Definition:

Artificial insemination is the introduction of male reproductive cells into the female reproductive tract by artificial means.

History:

Mass breeding of cows through artificial insemination was first accomplished in Russia, where 19,800 cows were bred in 1931 and by 1938 many thousands of cattle and horses and millions of sheep were being successfully bred around the world. Artificial Insemination was first accomplished in India in 1939 Dr. Sampathkumar at the Palace Dairy Farm, Mysore. Nowadays, artificial insemination is used to a large extent all over the world where improvement of breeds takes place – in fact over 90% of dairy cattle in the west are bred by AI.



30 mins

methods ▪ Brainstorming
▪ Lectures
▪ Sharing experiences (guest faculty)

process Brainstorm the participants on artificial insemination

Key Question: what is artificial insemination in animal breeding?

Elicit their responses. Supplement with the definition of AI and a brief history of AI in the world and in India.

Invite a veterinarian who is experienced in AI to share his or her experiences with AI for animal breeding.

stop and check! Participants are able to define AI.



7-2 Advantages and limitations of AI

materials ▪ Charts and markers

content What are the advantages and limitations of A.I?



1 hour

Advantages	Limitations
<ul style="list-style-type: none"> ▶ Many cows can be bred with a superior bull. ▶ Regularity in calving and milk production is assured. ▶ Pregnancy can be easily confirmed. ▶ Increases the rate of conception. ▶ Cow can be kept free from coital infections. ▶ Problem cow can be treated ▶ Accidents during natural service can be avoided. ▶ Animals with defects can be bred through Artificial insemination. ▶ Overcomes the difficulty of size and weight. ▶ Old, heavy or injured sires can be used. ▶ Nymphomania (frequent and/or prolonged heats mostly due to cystic ovarian follicles (COF)) can be diagnosed and the animal can be disposed off early. ▶ It is cheaper than maintaining a sire ▶ The dairy owner does not have the problem of searching and purchasing a new herd sire every two years to avoid inbreeding ▶ Helps in better record keeping about the breeding population. 	<ul style="list-style-type: none"> ▶ Requires well trained operators and special equipment. ▶ Requires a cold chain for liquid nitrogen canisters ▶ Requires more time than natural services. ▶ Necessitates the knowledge of structure and function of reproductive organs of animals on the part of the operator. ▶ Improper cleaning of instruments and in sanitary conditions may lead to lower fertility.

methods ▪ Brainstorming and discussions
▪ Lecture



process Brainstorm the participants on the usefulness of AI.
Key Question: What are the advantages and disadvantages of AI?
Elicit responses from participants and supplement with content above – clarifying concepts.

stop and check! Participants are able to list the advantages and disadvantages of AI.

7-3 Collection of semen

materials

- Charts and markers
- Pictures
- AI container
- Scissors
- Forceps
- Straws
- Sheath
- AI gun
- Thawing cup

content

Artificial Insemination technique requires careful preparation and the use of specialised equipment. The first step in AI is the collection of semen. The steps involved are:

1. Selecting the sires
2. Preparing the artificial vagina
3. Collecting the semen
4. Examining and evaluating of the semen
5. Diluting the semen
6. Deep freezing of semen for storage



**2 hour
30 mins**

Parts of the Artificial Vagina

1. Rubber cylinder - inner diameter of 6 cm with length between 30 cm for young bulls and 40 cm for adult bulls. The cylinder has rims on either side. A valve is fixed at above 5 cm from one end to admit water and air in the preparation of artificial vagina. The outer edges of the cylinder are upturned and refilled so as to have a firm grip by the inner sleeve.
2. A thin inner latex - of a diameter between 7.0-8 cm with a length of 30-50 cm which is turned back over each rim of the outer cylinder and tightly held by thick rubber bands
3. Rubber cone- between 20-25 cm in length is mounted on the cylinder to the end where water and air inlet. Valves are closed.
4. Glass collection tube of 10 ml capacity is fixed to the conical end of rubber cone
5. Insulation Bag covering the glass tube and rubber cone is fixed on the rubber cylinder with strap for protecting semen in tube from cold and direct sun rays.



Preparing the Artificial Vagina:

- The parts of artificial vagina should be clean, sterile and dry before assembling.
- Before semen collection warm water between 45° – 50° C is filled through the filling aperture into the space between outer cylinder and inner latex to provide inner temperature between 42°-46° C
- Soft paraffin is now smeared over the inner surface of the latex liner
- During collection the collector should hold the AV at 45° angle to the ground
- Semen collection can take place twice or thrice in a week.

Examination and evaluation of semen:

Once semen is collected conduct a visual macroscopic inspection of volume, colour and consistency.

1. Collect 5-8 cc/ml of semen
2. Colour: Normal colour – white
Pathological indication in colour:
Yellow- Pus or Urine
Pinkish or Reddish – Admixture of fresh blood
3. Consistency:
Thick creamy - Excellent
Thin creamy - Very good
Thick milky - Good
Thin milky - Fair
Watery - Extremely poor
4. Now conduct a microscopic examination to verify mobility and structure

a. Mobility of spermatozoa

0	No motility
+	Less than 20% of the sperms showing progressive motion
++	20- 40% showing progressive movement but no wave
+++	40- 60 % showing progressive movement with slow wave
++++	60- 80 % showing progressive movement with wave more intense
+++++	80-100% showing progressive movement with rapid wave

As a rule +++ or more are recommended for Artificial insemination purpose

b. Live and dead sperm count

c. Morphological abnormalities: Head, Neck, Middle piece and tail (see picture overleaf)



Dilution of semen:

The main objectives of extending or diluting semen are:

- To increase the volume of the ejaculate obtained from quality adult males, so that a large number of females may be mated from a single dose. In natural mating one ejaculate is used to inseminate one female whereas by extension of the same volume of semen, several hundred (500-1000) females can be effectively inseminated
- Ejaculated sperm does not survive for long period and thus to preserve the fertilizing capacity of the spermatozoa for a long period various agents are added.

Dilutors – Egg yolk citrate

Functions of the agents:

- Provide nutrients as a source of energy
- Provide lipoprotein to protect sperm cells against low temperature shock
- Provide a buffer to prevent harmful shift in pH as lactic acid is formed with metabolism of sperms.
- Maintain the proper osmotic pressure and electrolyte balance
- Inhibit bacterial growth
- Provide a buffer for a proper balance of mineral elements essential to the life of sperm cells

Deep freezing of semen:

The diluted semen is stored in liquid nitrogen at a temperature of -196°C .

Methodology for freezing semen:

1. Preparation of diluents
2. Collection, evaluation, dilution, equilibration
3. Packaging of frozen semen
4. Printing of straws
5. Filling and sealing of semen
6. Freezing the straws in LN_2 (Liquid nitrogen) vapour

Precautions and First aid practices for persons handling LN_2 :

1. Liquid Nitrogen is a very cold but non-poisonous gas
2. In a closed room, evaporated liquid Nitrogen replaces the air (nitrogen-oxygen mixture).
A person working under such condition may fall unconscious without sensing any warning symptoms. If a person seems to become unconscious working with LN_2 , i.e., in a semen bank or LN_2 plant room, bring this person to a well ventilated room immediately. If breathing has stopped, give artificial respiration

3. If LN_2 comes into contact with skin or eyes, it creates the same sensation as burning or frost bite. If any such accident happens rinse the affected part of the body immediately with a lot of cold water and consult a physician.

methods

- Lecture
- Demonstration

process Describe the process of collecting, testing and storing semen.
 Display equipment used for collecting and storing semen. Let the participants handle the equipment to understand their structure and use.
 Mention precautions to be taken in different aspects of AI.
 Use videos and pictures to show actual use of the equipment. The links below use Quicktime software.
 Semen collection: <http://animalsciences.missouri.edu/reprod/video/bullcol.mov>
 Semen storage: <http://animalsciences.missouri.edu/reprod/video/Busmpro.mov>
 Semen freezing: <http://animalsciences.missouri.edu/reprod/video/bulsefre.mov>
 Clarify any doubts and open the floor for discussions.

stop and check! Participants are able to correctly identify and explain the various equipment used in AI.
 They are able to describe the process of semen collection, dilution, examination and freezing.
 They are able to explain the precautions to be taken while collecting semen, handling liquid nitrogen and correct storage.

7-4 AI techniques

materials

- Charts and markers
- Pictures and video

content There are two techniques of Artificial insemination.

1. Recto vaginal technique:



Advantages:

- The method is relatively simple, easy to operate and is widely used in practice all over the world.
- Intrauterine insemination is possible by recto vaginal technique.

Disadvantages:

- Requires well trained operators.

2. Speculum Method:

The operator dilates the vulvar lips and introduces a speculum into the vaginal passage. Insemination pipette containing diluted semen is then introduced through the vaginal passage and inserted half way into the cervix where semen is syringed.

Insert picture is in Okcareer document

Advantages:

- Easier for less trained operators

Disadvantages:

- The speculums are required in different sizes to suit cows of various sizes.
- Vaginal speculum may not be 100 % sterilised after each insemination
- Intrauterine insemination is not possible

Procedure for loading the AI Gun

1. Ensure that the AI gun has the right temperature. It has to be between the temperature of the thawed semen and of the uterus.
2. There may be air bubbles anywhere in the thawed straw. Bring up the bubbles just below the single plug.
3. Insert the straw into the AI gun
4. Make a horizontal cut through the air bubble about 1 cm below the top of the straw. Keep the AI gun upright, the top being at eye level.
5. Strip a new plastic sheath over the straw and the AI gun without touching the upper half of the sheath. The plastic ring is kept about 10 cm from the base of the AI gun, so that the sheath can easily be placed correctly without any hindrance caused by the plastic ring.
6. Fix the end of the straw to the top of the sheath.
7. Fix the plastic sheath after checking the straw position. Hold end of the AI gun with one hand and the plastic ring in the opposite direction
8. Push the piston of the AI gun until it touches the double plug of the straw.
9. Retract the AI gun

See Artificial Insemination: Student Worksheet <http://www.okcareertech.org/cimc/downloads/ag/ansci-s.pdf>

- methods**
- Lecture
 - Demonstration

- process** Describe the two techniques of AI. Use videos and pictures for clarity.
List the advantages and disadvantages of each method of AI.
Describe the procedure for loading the AI gun using actual equipment where possible or with pictures and videos.
If possible allow participants to repeat this as a dummy exercise and to see it in actual practice in the field.
Clarify understanding at each stage. Open the floor for discussions and clarify or repeat lessons.
- stop and check!** Participants are able to describe the two techniques of artificial insemination and their advantages and disadvantages. They can correctly describe the procedure for loading the AI gun and demonstrate the same.

7-5 Diagnosing pregnancy

- materials**
- Charts and markers
 - Pictures and video

content **Importance of diagnosing pregnancy**

Pregnancy or gestation is the condition of a female when a developing young is present in the uterus. The importance of detecting whether a female animal is pregnant or not is directly related to the economy of dairy management. A female may sometimes show a number of signs which are strongly suggestive of pregnancy but on proper diagnosis it may not be found correct. Much valuable time will be lost. On the other hand if a cow is really pregnant, it can demand a change in her feeding schedule as well as the management from the very early stage. In case of failures due to infertility, sterility, etc., the causes as well as curative measures will be required.



1 hour

Oral information about pregnancy symptoms obtained from the cattle owner is not reliable, because the owner may conclude only from the absence of heat which is an unsure sign of pregnancy. In these situations, timing is important so that a diagnosis can be made and potential financial losses can be minimised.

Methods of detecting pregnancy

Some simple signs of detecting pregnancy include:

- Cessation of oestrus
- The animal has a tendency to grow fat
- Increase in body weight of the animal at the last half of pregnancy
- Increase in the volume of the abdomen at a later stage of pregnancy
- Changes in mammary glands

More detained examinations can be done:

- By rectal examination
- By laboratory methods





How to enter the rectum and location of the genital organs

Materials required for conducting a pregnancy diagnosis by rectal examination

1. Rope
2. Bucket of water, soap, towel
3. Lubricant such as liquid paraffin or edible oil
4. If possible protective clothing such as apron and gumboots

Use left or right arm but observe the following:

1. Finger nails should be short and blunt.
2. Lubricate hand and arm properly.
3. Put the hand into the rectum by forming a cone and dilate with it by making slow rotating motions. This method helps to prevent injuries in the rectum and it induces defecation.
4. Remove the remaining dung with backward movement and squeezing of your hand
5. If the animal is straining withhold examination until all such movements have ceased. You may otherwise cause injuries.
6. Sometimes the rectum becomes filled with air. The examination is then impossible and it may also lead to injuries. Expel the air by careful forward and backward movement of your hand.

Differential diagnosis – when the examination leads to mistaken diagnosis:

Differential diagnosis in pregnancy examination:

1. The following organs may be confused with signs of pregnancy:
 - Urinary bladder - May be confused with pregnant horn
 - Rumen - May be confused with foetus
 - Left pendulous kidney - May be confused with foetus
2. A number of abnormal conditions of the uterus may be confused with pregnancy:

Conditions	Notice
1. Mucometra -Accumulation of mucous it may be confused with pregnancy of 2 months	<ul style="list-style-type: none"> • Double wall slip absent • Foetal bump and foetus absent • The fluid moves from one horn to the other, this is not the case in pregnancy
2. Pyometra - Accumulation of pus in the uterus, frequent after abortions, retention of placenta and unhygienic assistance during calving. It may be confused with pregnancy of 2-3 months	<ul style="list-style-type: none"> • Double wall slip absent • Foetal bump and foetus absent • Placentomes absent • Pus moves from one horn to the other

3. Chronic endometritis 4. Enlarged pendulous uterus hanging over the pelvic brim	<ul style="list-style-type: none"> • Double wall slip absent • Foetal bump and foetus absent • Uterine wall might become hard and thick.
5. Mummified foetus (dead foetus in the uterus) 6. Macerated foetus	<ul style="list-style-type: none"> • Complete absence of foetal fluid, therefore, no foetal bump • The dead foetus is a hard mass, which does not move in the uterus • No placentomes can be felt • Double wall slip absent • Foetal bump absent • No placentomes can be felt • Only bones of the dead foetus can be felt

A rare case of lymphocytic pyometra in a cow with leukosis. Courtesy of Dr. Robert M. Lofstedt: <http://www.merckvetmanual.com/mvm/htm/bc/repme01.htm>

- methods**
- Lecture
 - Discussion
 - Pregnancy diagnosis materials

Define pregnancy and the importance of diagnosing pregnancy in animals.

Describe the different methods of diagnosing pregnancy.

Describe how to conduct a rectal examination.

Show videos:

1. Palpating an open cow (not pregnant)
<http://animalsciences.missouri.edu/reprod/video/cowpOT.mov>
2. Palpating a pregnant cow
<http://animalsciences.missouri.edu/reprod/video/cowpPT.mov>

If possible arrange for a demonstration using a cow reproductive tract.

note to the trainer

It is not advisable to allow trainees to palpate a pregnant cow as it can lead to the death of the foetus or injury to the cow if done improperly.



Describe events when a false diagnosis of pregnancy can take place. Use pictures to explain some of the common causes of mis-diagnosis.

Open the floor for discussions and clarify doubts if any.

stop and check!

The participants are able to define pregnancy and explain the importance of diagnosing pregnancy in livestock. They can describe the procedure for rectal examination to determine pregnancy in cows. They can explain various conditions that can lead to mis-diagnosis of pregnancy and the presentations in each condition.

Recap the entire session on artificial insemination and diagnosis of pregnancy and clarify doubts that remain. Arrange for a detailed field exposure to the entire AI chain – from selection of stud bulls to AI and diagnosis of pregnancy.

resources

Dr. Rodney Geisert: University of Missouri (Animal Sciences)

<http://animalsciences.missouri.edu/reprod/> : this site has a wealth of information on animal reproduction – notes, images, and videos

Dr. Rodney Geisert: Learning reproduction in farm animals: Missouri State University – has excellent videos for this Module. <http://animalsciences.missouri.edu/reprod/video/index.htm>

Dr. M.L. O'Connor. Artificial Insemination Technique. Dairy Integrated Reproductive Management

The Pennsylvania State University. IRM 12 <http://www.wvu.edu/~agexten/forglvst/Dairy/dirm12.pdf>

Dr. RG Steane: The artificial insemination (AI) of cattle: <http://www.biotopics.co.uk/edexcel/biotechnol/artins.html>

<http://www.thebeefsite.com/articles/721/artificial-insemination-for-beef-cattle> or http://www.uaex.edu/Other_Areas/publications/PDF/FSA-3118.pdf

Artificial Insemination: Student Worksheet – Module 6 <http://www.okcareertech.org/cimc/downloads/ag/ansci-s.pdf>

Animal diseases

module aim Animal diseases are a fact of everyday life especially for resource poor owners. Animals kept by the poor are more vulnerable to disease because they are surrounded by disease causing organisms, the animals are not managed well and with poor nutrition they are prone to illness. As such people also keep very few animals, even the loss of one animal can significantly affect their livelihoods. The purpose of this module is to enable participants to learn about various seasonal diseases, metabolic diseases and preventive measures in livestock and poultry. This module also intends to create awareness on various poisonous substances. It is hoped that adequate preventive care and awareness could itself reduce the vulnerability of livestock to diseases and illnesses.

learning objectives At the end of this training module participants will be able to

- Describe various bacterial, viral, parasitic, metabolic diseases
- Describe the causes, symptoms, preventions and control of livestock diseases
- Explain the effect of various toxic substances on the health of animals and the relevant first aid or treatment where possible
- Explain the need for scheduled vaccination of livestock

module summary

Session Title	Duration
1. Classification of diseases	30 min
2. Bacterial diseases	2 hours
3. Viral diseases	2 hours
4. Parasitic diseases	1 hour
5. Metabolic diseases	1 hour
6. Poisoning	1 h 30 min
7. Vaccination schedules	1 h 30 min
Total	2 days

materials Charts and markers, pictures

handouts On diseases, symptoms and treatment

methods Brainstorming, discussions, lectures, presentations and demonstrations, field visit

field visit To veterinary dispensary or farm

guest lecture A practising veterinarian



8-1 Classification of diseases

materials • Charts and markers

content Introduction

The most important factor adversely affecting animal production and reproduction is disease. Animals are kept under hot humid environments and mostly under unsanitary conditions. They are usually susceptible to a large number of bacterial, viral, protozoan, parasitic and nutritional diseases round the year. This leads to economic losses – not just to the owner but also to neighbours. So, timely recognition and prevention of disease is necessary.



45 min

Classification of Diseases			
Bacterial diseases	Viral	Parasitic	Metabolic diseases
1. Anthrax 2. Haemorrhagic Septicaemia 3. Brucellosis 4. Black quarter 5. Mastitis 6. Tuberculosis	1. Rinderpest 2. Foot and mouth diseases 3. Rabies 4. Pox diseases 5. Blue tongue 6. PPR 7. C a n i n e distemper 8. R a n i k h e t disease 9. Bird flu	1. Endo parasites 2. Ecto parasites	1. Milk fever 2. Acetonaemia (or) post parturient ketosis 3. Grass tetany (or) Hypomagnesemia

methods • Brainstorming
• Lecture

process Brainstorm the participants on the effect of disease on animal production and reproduction
Key Question: How does disease affect the health of livestock?
Elicit participant responses and describe the common causes for diseases in livestock.
Classify different diseases and list the major ones.
Open the floor for discussion and clarify doubts if any.

stop and check! Participants are able to explain some common causes for diseases in livestock and classify diseases.

8-2 Bacterial diseases

- materials**
- Charts and markers
 - Pictures/presentation
 - Newspaper cuttings on disease outbreaks

content **Definition:** Bacteria are a very important group of microorganisms because of both their harmful and their beneficial effects. They are widely distributed in the environment. They are found in air, water and soil, in the intestines of animals, on the lining of the mouth, nose and throat, on the surface of all animal and plant body. Bacteria are the smallest single celled organisms. Important bacterial diseases are explained below.

Anthrax

It is a highly septicaemic disease seen mostly among cattle, sheep, and pig. In humans it causes malignant pustule or wool sorter's disease caused by *Bacillus anthracis*

Symptoms:

- High fever
- Difficulty in breathing
- Bleeding from ears, mouth, nose, anus, and vagina
- Blood does not clot
- Trembling and convulsive movements
- Animal collapses and dies quickly



1 hour

Animals susceptible: Cattle, buffaloes, horses, pigs, camels, dogs, and humans.

Source of infection: Soil contaminated with *Bacillus anthracis*, spores of fodder grown on infected soil, contaminated drinking water, excreta, blood, etc.

Prevention and Control

- Improve hygiene in the shed
- Do not open the carcass for post mortem if anthrax is suspected because the anthrax spores will be distributed all over the area and can survive a long time (even centuries).
- Burn or bury the infected carcass immediately, together with bedding and contaminated soil.
- Bury the animal 2 metres deep. Cover with quicklime on all sides and the top.
- Never drag an anthrax carcass along the road. Use a cart or ambulance which should later be thoroughly disinfected.
- Annual vaccination with Anthrax Spore Vaccine is a must for all animals in endemic areas

Haemorrhagic septicaemia

This is a highly fatal, acute septicaemic infection, also known as septicaemic pasteurellosis, caused by *Pasteurella multocida*.

Symptoms

- Fever
- Discharge from the nose
- Cough
- Lack of activity
- Lack of appetite
- Bloat



- Swelling of the neck
- Laboured breathing

Animals susceptible: Mainly affecting buffalo, cattle and to lesser extent, pig, horse and camel.

Source of infection: The disease causing organism multiplies rapidly in lungs, and infected droplets are exhaled in the air. Disease is spread either by droplet inhalation or by ingestion. Sick animals also contaminate the atmosphere and grass by

excreting a large number of bacteria from the nose or mouth or in the faeces. Environmental stress, starvation, chilling, or change in diet can bring on the disease.

Prevention and control

- In endemic areas, carry out preventive vaccination every year, one month before the onset of rains.
- Vaccinate promptly if there is an outbreak of haemorrhagic septicaemia in your area.
- Segregate healthy animals from sick animals and from others that have come into contact with the sick animals

Brucellosis (Contagious bovine abortion)

It is a bacterial infection caused by *Brucella abortus* in cattle and buffaloes and *Brucella melitensis* and *Brucella ovis* in sheep

Symptoms: Abortion or retained placenta

Animals susceptible: Cattle, buffaloes, sheep, goat, and pigs and humans (zoonotic).

Source of infection: Aborted foetus, foetal membrane, vaginal discharge. Milk and faeces of infected animals contain the disease organisms which contaminate the environment, feed, water, and grazing ground.

Prevention and Control

- Identify and isolate the affected animals.
- Dispose aborted foetus, placental and uterine discharges, contaminated litter, and soil by burning or burying after covering with quicklime.
- Vaccinate 3-6 month-old calves (*Brucella abortus* strain 19)
- Make sure that fresh stock is free from the disease

Black Quarter (Blackleg)

Black quarter is an acute infection but a non contagious disease characterized by inflammation of muscle, severe toxemia and high mortality in cattle, is caused by *Clostridium perfringens*.

Symptoms

- Fever
- Lameness
- Swollen muscles in affected area-bubbles can be felt under the skin in the swollen area

Animals susceptible: Cattle, buffaloes

Source of infection: Soil contaminated with infected faeces or decomposed carcasses, contaminated foodstuffs, water, and open wounds.

Prevention and control: Vaccinate all animals every year before the monsoon season

Mastitis

Refers to the inflammation of udder and is characterised by physical and chemical changes in the milk which include discoloration. At least 50 infectious agents are responsible for mastitis, but Staphylococcus and Streptococcus bacteria are the principal pathogens responsible in majority of cases.

Symptoms

- Sudden rise in body temperature.
- Enlargement and hardening of affected quarter with cessation of milk secretion.
- Milk secretion become blood strained and contains pus.
- Sometimes affected quarter becomes dark in colour, cold, gangrenous and finally sloughs off.

Animals susceptible: Cow, buffaloes, goats, sows mares and camels.

Treatment and Control

- Antibiotics and sulphonamides.
- Improve hygiene
- Animals diagnosed positive should be milked last.
- Milkers should wash their hands before milking.
- A separate clean cloth for each cow is used for washing the udder with disinfectant.
- The first stream of milk from each quarter should not be allowed to drop on the floor but to be collected in a separate container

Tuberculosis (TB):

It is an infectious disease characterized by slow development of tubercles in almost any organ of the body except the skeletal muscle, caused by Mycobacterium bovis (in livestock).

Symptoms

- Low, recurrent fever
- Weakness
- Lack of appetite
- Progressive loss of weight despite good nutrition and care
- Enlarged superficial lymph nodes. You can feel them as swellings behind the ears and in front of the shoulders.

Animals Susceptible: All species

Source of infection:



Contaminated environment, contact with infected animals, food contaminated with infected discharge, faeces, urine or milk. In damp, contaminated environments, such as watering troughs, stagnant ponds and accumulated manure, the bacteria survive for many months.

Prevention and Control

- Have a tuberculin test done. (Consult a veterinarian)
- Clean and disinfect troughs for feed and water.
- Isolate infected mothers and their calves from the herd immediately at birth.
- *M. bovis* is innately resistant to pyrazinamide; therefore the standard treatment is isoniazid and rifampicin for nine months.

methods • Presentation
• Discussion

process Define the term bacteria. Describe in detail common bacterial diseases that affect livestock – listing out the definition of the disease, symptoms, animals susceptible, sources of infection, prevention and control.

After explaining each disease stop and check for understanding.

Use energisers during the session as it can be long and tedious.

stop and check! Participants are able to define the term bacteria and bacterial diseases. They are able to describe the presentation, treatment and prevention for each bacterial disease.

8-3 Viral diseases

materials • Charts and markers
• Pictures/presentation
• Newspaper cuttings on disease outbreaks

content Viruses are the smallest of all micro organisms. Most viruses are not visible under the light microscope. Viruses are acellular and always pathogenic. They cause disease in humans, animals, plants and other microorganisms. Viral diseases are manifested in acute, sub acute or chronic forms, some of which are fatal. These diseases occur in epidemic or endemic forms. Viruses spread either directly by contact or indirectly through infected clothes, food and water troughs or by droplet infection.



1 hour

Rinderpest

This is a highly fatal viral disease of cloven footed animals, caused by Morbilivirus

Symptoms

- Very high fever
- Discharge from the nose
- Foul-smelling shooting diarrhoea which contains blood and mucus
- Difficulty in breathing

- Watery eyes
- Dehydration
- Lesions on mouth and tongue
- Animal cannot eat

Animals susceptible:: Cattle, buffaloes, sheep, goat and pigs

Source of infection:

The virus is found in saliva, discharge from eyes and nostrils, and in urine and faeces. It contaminates pastures and grasslands, and spreads by ingestion of contaminated feed and water.

Prevention and control

- Infected animals are to be isolated
- All adult cattle and calves more than 3 months old should vaccinated.
- Revaccinate exotic and crossbred animals every 3 years.
- Plug all natural openings of the carcass of dead animals with cotton to prevent oozing out of infected blood and discharge

Foot and Mouth Disease

FMD is a highly communicable disease affecting cloven footed animals The causative agent is O, A, C and Asia-1, SAT-1, SAT-2 and SAT-3. Of these O, A, C and Asia-1 have been recovered from outbreaks of FMD.

Symptoms:

- Blister-like sores and ulcers on udder, teats, feet, and inside the mouth, nose, and muzzle.
- Excessive salivation
- Fever
- Lack of appetite
- Refusal to eat

The disease usually lasts about a week but can last longer. It is often fatal to young animals.

Animals susceptible: Cattle, buffaloes, sheep, goats, and pigs.

Source of infection:

The disease causing virus remain alive in dried saliva and can contaminate the feed. Infected animals spread enormous amounts of virus from their mouths and noses into the air. The disease can also spread through contaminated water, hay, and pastures.

Prevention and control

- Dispose off contaminated feed and dung in a compost pit.
- Isolate affected animals.
- Bury dead animals in a pit of 2 m deep after covering the carcass with quicklime.
- Get first vaccination done at the age of 6-8 weeks, followed by a booster dose 4-6 weeks later. Repeat the vaccination as advised by a veterinarian.



Rabies

Rabies is a fatal viral disease of dogs and cats caused by Lyssavirus. It causes an acute encephalomyelitis. The disease in man is also known as hydrophobia, because the affected individual develops a fear of water.

Symptoms

- Animal becomes aggressive
- Bellowing
- Frequent Urination
- Salivation
- Constipation
- Animal becomes vicious-runs at and tries to bite anything that moves.
- Convulsions
- Death

Animals affected

- All mammals are susceptible: Cattle, buffaloes, horses, mules, and camels, but is most common in dogs and cats. Can also infect humans.

Source of infection

Dogs and cats are the main source of infection. Foxes and bandicoots act as carriers and are the most important reservoirs of the disease. The disease is communicated from animal to animal and to people chiefly by bites of rabid animals. The virus is excreted in saliva. Infection can also occur while handling infected animals. The virus can enter through scratches or wounds. Infection can also occur through licking by dogs and cats. Saliva of rabid animals infects pastures, utensils, and housing. Infected saliva remains virulent for many days. The virus can survive in water for 20-30 days. Contaminated water can transmit the disease to healthy animals.

Prevention and control

- Keep animals away from rabid dogs and cats.
- Promptly wash the wounds of bitten animals with water. Allow the wounds to bleed for some time. This helps to wash out the virus.
- Apply tincture of iodine on the wounds.
- If a dog or cat bites your livestock, keep both the livestock and the dog or cat confined and under observation for 10 days.

Rabies in humans:

Symptoms:

- Severe headache
- Vomiting sensation
- Watering from eyes and nose and extreme dryness of the throat
- Paralysis of the throat soon sets in and he /she is unable to eat or drink. The paralysis soon extends to the entire body and the patient dies in about 7 days.



Pox Diseases

Animals, humans and birds are susceptible to certain forms of contagious eruptive fevers known as pox diseases.

Cowpox

This infection although mostly occurring in cows, sometimes also occurs in buffaloes. The occurrence of cowpox has frequently been associated with the incidence of small pox in human beings. It is transmitted through milkers.

Symptoms

- Rise in body temperature.
- Red spots and papules on the udder.

Treatment prevention and control

- Lesions should be cleaned with potassium permanganate solution.
- Application of an antiseptic ointment.
- Affected animals should be isolated and milked by separate milkers. Milk from affected animals should be boiled before use

Sheep pox

Sheep pox is a highly contagious disease. It causes a mortality of 20-50% in animals below the age of 6 months, and cause damage to the wool and skin in adults.

Symptoms

- High fever
- Symptoms of Pneumonia
- Acute enteritis
- Skin lesions appear particularly in parts free from wool, around the eyes, inner side of the thigh udder and under surface of the tail.
- Internal organs such as trachea, lungs, kidneys and intestines are also affected.

Prevention, Treatment and control

- Vaccination.
- Ulcers on the skin should be washed with Potassium permanganate (KMnO₄) lotion and dusted with boric acid.
- Strict hygienic measures

Blue Tongue

BT is an infectious, non-contagious, insect borne viral disease caused by an Orbivirus of the family Reoviridae.

Symptoms

- Enteritis
- Lameness and fever
- Facial oedema and haemorrhages
- Ulceration of mucous membrane swollen and hyperaemic tongue
- Inflammation of the coronary band of the hoof.

Animals susceptible: Sheep, goat, and cattle.

Prevention and Control

- Washing of wound with Potassium permanganate (0.1 gm in 300ml water), Lugol's iodine (5gm iodine+10 gm + 100 ml water) and copper sulphate (10 gm in 100 ml water) provides some relief and controls secondary infection.
- Vaccination



PPR (Peste des Petits Ruminants):

PPR is an acute contagious disease caused by Morbili virus in the family paramyxoviridae.

Symptoms:

- Fever
- Decreased appetite
- Dull coat
- Haemorrhagic gastroenteritis
- Dry muzzle
- Restlessness
- Diarrhoea
- Thick discharge from nose and eyes
- Respiratory distress
- Pregnant sheep and goats may abort.

Animals susceptible: It affects small ruminants (sheep and goat)

Prevention and control: Vaccination

Canine Distemper

Highly contagious disease of dogs. The virus belongs to the genus Morbilivirus in family Paramyxoviridae. The virus is airborne, being spread by secretions from the eyes and nose.

Symptoms

- Fever (diphasic course). The temperature follows a diphasic course with an initial rise lasting for 1-3 days followed by an apparently normal temperature for a day or two and then a secondary rise lasting for a week or longer.
- Loss of appetite.
- Constipation followed by diarrhoea.
- Vomiting
- Affecting respiratory tract lead to coughing, laboured breathing and nasal discharge
- Epileptic fits followed by blindness, paralysis of hind legs, meningitis, twitching of the ears, jaws and limbs

Treatment, Prevention and Control

1. Care and nursing.
2. Protect the animal from extremes of temperature.
3. Soft food.
4. Eruptions occurring on the under surface of the body should be dusted with boric acid.
5. Sulphonamide and penicillin (prevention of secondary infection).
6. Vaccination.

Ranikhet diseases

Ranikhet disease also known as Newcastle disease is a contagious and highly fatal disease of fowls. The disease is caused by Paramyxovirus.

Symptoms

- In young birds: sneezing, gasping, and often droopiness.
- Adult birds - dull and depressed with ruffled feathers, diarrhoea, characterised by the passing of a watery stool with an offensive smell.
- Profuse salivation and accumulated in the mouth and obstructs respiration, which results in the production of a gurgling sound.
- Decline in egg production. The eggs laid by infected birds may be soft shelled and deformed.

Prevention and control:

- No effective treatment.
- Slaughtering of all apparently ailing birds. Removal of all infective materials such as droppings residues of poultry feed and litter.
- Vaccination of birds 6 weeks and above

Bird Flu (Avian influenza):

Avian influenza is caused by type A influenza virus of RNA type belonging to family orthomyxoviridae. Avian influenza can vary from a very mild to highly fatal disease depending on the strain of the virus and host factors. All bird species are susceptible to infection with avian influenza virus.

Symptoms:

- Respiratory signs include coughing, sneezing, respiratory sounds and excessive discharge from eyes.
- Layers and breeders may show increased broodiness and decreased egg production.
- Affected birds show increased huddling, ruffled feathers, depression and decreased feed and water consumption and occasionally diarrhoea and mortality.

Highly pathogenic avian influenza infection is most fulminating type of disease in which there is sudden onset of high mortality which may reach to 100% within few days. If the birds survive they may exhibit nervous disorders such as tremors of head and neck, inability to stand, torticollis. Egg production may completely stop. Birds which take some time to die, may also show excessive eye discharge, respiratory sounds, swelling of head and face, bluish discolouration of head and wattles.

Control:

- Prevent the introduction of new birds.
- Clean out vegetation around poultry houses and pens.
- Prevent the accumulation of standing water.
- Isolate dead bird disposal outside perimeter of the farm.
- Sanitation addresses the disinfection of materials, people and equipment entering the farm and the cleanliness of the personnel of the farm.

- methods**
- Presentation
 - Discussion

stop and check! Participants are able to define the terms virus and viral diseases. They are able to describe the presentation, and prevention for each viral disease.

note to the trainer Include content about fresh outbreaks of viral diseases relevant to the time. E.g., swine flu (H1N1) was prevalent in 2009.

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8-4 Parasitic diseases

- materials**
- Charts and markers
 - Presentation slides

content What is a parasite?

A parasite as an organism, plant or animal which lives upon or with another living organism at whose expense it obtains some advantage without compensation

Parasitic diseases:

Definition: Diseases caused by parasites (endo or ecto parasite)

Endoparasitic infestation:

A parasite may live inside of the body or in the lumen of the intestine.

Causes:

- Unhealthy hygienic conditions
- Under nutrition / malnutrition leading to mineral deficiency and lower resistance
- Contact with infested animal, water supply, pasture, faecal material
- Intermediate hosts i.e., flies, ticks, etc. also spread them
- Ingestion of soil, licking of walls, gates, infested floors, etc.



1 hour

Treatment:

- Keep the pens and premises clean and dry
- Remove dung and store in a compost pit at a safe distance
- Composting kills the parasites and their eggs
- Ensure clean drinking water
- Follow deworming schedule

Ecto parasitic infestation:

A parasite may live on the surface of the body.

Causes:

- Hot and humid living conditions.
- Unclean animal and surroundings
- Overcrowding and housing indoors.
- Contact with infested animals, buildings, pastures.

Treatment:

- Keep the animal, shed and surroundings clean.
- Wash and groom the animals especially the hidden parts regularly and spray them as soon as lice/ticks noticed
- Apply sulphur mixed coconut oil (3:1)
- Spray the animals with suitable insecticides at periodic interval. In serious cases injecting the animal with suitable preparations like ivermectin may be required, especially when scabies has developed.
- Supplement minerals in the diet

- methods**
- Brainstorming
 - Lecture
 - Discussion

process Define the terms parasite, endoparasite and ectoparasite. Describe in detail common parasitic diseases that affect livestock – listing out the definition of the disease, symptoms, sources of infestation, prevention and control.
After each disease stop and check for understanding.

stop and check! Participants are able to define the terms parasite, endo and ecto parasite, and parasitic diseases. They are able to describe the presentation, and prevention for each parasitic disease.

8-5 Metabolic diseases

- materials**
- Charts and markers
 - Presentation slides

content Metabolic disorders:

Metabolism means the basic chemical processes that take place within the body of a living organisms that help it to remain alive. Digestion, respiration, excretion, etc. are metabolic processes. When metabolic processes are upset by changes in weather, diet, infection, the animal becomes diseased. Some common metabolic diseases that affect livestock severely are explained below.



1 hour

Milk fever or hypocalcaemia or parturient paresis

The disease usually occurs in 5-10 year old cows and is chiefly caused by a sudden decrease in blood calcium level, generally within 48 hours after calving. The volume of milk secretion particularly when the udder is completely emptied soon after birth may lower the calcium from its normal level of about 10 mg to 3-8 mg per 100 ml of blood. The production of colostrums by the animal may also bring about rapid reduction in the concentration of the blood calcium. Serum calcium is of great importance in maintaining muscle tone.

Causes:

- Decrease in the levels of ionized calcium in tissue fluid
- Decrease in serum calcium level in some cows.



**Symptoms:**

- Loss of appetite
- Constipation and restlessness
- No rise in temperature
- Muscular weakness, unsteadiness of movement
- Stiffness of gait
- The animal lies down with its head inclined laterally and appears to be in deep sleep with depressed consciousness
- Not able to swallow its food
- Breathing may be slow and deep
- Tongue hanging down from the half open mouth.

Prevention:

Monosodium phosphate (5% concentration) in the concentrate ration and intramuscular administration of 10 million units of vitamin D3 in a single dose 2-8 days before calving.

Treatment and control:

Slow injection of 300 ml of 20 percent solution of calcium borogluconate and simultaneous injection by the subcutaneous route of 50-100 ml of same solution.

Grass tetany or hypomagnesemia or lactation tetany

Grass tetany is especially encountered during late winter and in spring. Magnesium even though present in amounts of only 1.7-3 mg in 100 ml of bovine serum is of vital importance to life. In affected cases the magnesium level may be as low as 1 mg per 100 ml of serum. Continued excessive intake of potassium salts also interfere with normal mineral metabolism leading to disturbed calcium magnesium relationship.

Causes: Magnesium deficiency

Symptoms:

- Staggering or Paresis
- Grinding of teeth.
- Twitching of the muscle and tetanic contraction of the muscle of the hind limb
- Frequent urination
- Death occurs during convulsion

Treatment:

Combined preparation of calcium and magnesium, e.g., 500 ml of 25 percent of calcium borogluconate containing 5 percent magnesium hypophosphite.

Control: Feeding of 60 gm of magnesium oxide daily for cattle and 7 gm doses for sheep

Acetonaemia in cows (post parturient ketosis):

High milk yielding cows and buffaloes kept on poor energy diet suffer from energy deficiency leading to ketosis. There is an excessive accumulation of ketone bodies in the blood and urine along with decreased concentration of glucose.

Causes: Failure of supply of available glucose to tissues.

Wasting form:

- Decrease in appetite and milk yield in 2-5 days
- Dung firm and dry
- The cow appears depressed and is reluctant to move
- Temperature, pulse and respiratory rates are normal.
- Characteristic odour of ketones in the breath and in the milk

Nervous form:

- The animal walks in circle and there is apparent blindness.
- Tremors of head muscles later involve the whole body.

Treatment:

- 500 ml of 50 percent solution of dextrose daily for 1-5 days
- Ammonium lactate 200 gm daily for 5 days gives good result
- Thyroxine 250-300 mg/day for five days.
- In nervous form of the disease chloral hydrate in daily doses of 30 g may be given by mouth.

Control:

- Stall fed cows should have some exercise daily.
- Ration should contain sufficient amount of cobalt, phosphorus and Iodine.
- During the last two months of pregnancy, concentrate containing 10 percent protein should be provided at the rate of 2-3 kg every day. This may be gradually increased to 1 kg during the last two weeks of pregnancy.

- methods**
- Brainstorming
 - Lecture
 - Discussion

- process**
- Define the terms metabolic disease. Describe in detail common metabolic diseases that affect livestock – listing out the definition of the disease, causes, symptoms, prevention and treatment.

After each disease stop and check for understanding.

- stop and check!**
- Participants are able to define the term metabolic diseases. They are able to describe the presentation, prevention and treatment for each metabolic disease.

.....



8-6 Poisoning

- materials**
- Charts and markers
 - Pictures

content **Poisoning**

A poison is a substance that causes harm or death when introduced to or absorbed by an animal's body. Poisoning is a process where harmful substances - either natural or synthetic are introduced into an animal's body accidentally or even intentionally.

Causes:

- Chemicals such as arsenic, mercury and salt
- Poisonous plants such as lantana, young sorghum, and other plants in the flowering stages
- Pesticides and medicines used in fields
- Snake bite

Symptoms:

- Animals suddenly fall sick or die
- Animals show signs of illness
- Abdominal pain
- Groaning
- Kicking at the abdomen
- Diarrhoea
- Constipation
- Convulsions



1 hour

Treatment:

Drench: The oral administration of medicine in the form of a drink through mouth of the animal.

When poisoning is suspected

- Drench animal with 1 litre of paraffin oil or vegetable oil
- Drench animal with milk, water with powdered charcoal, or coconut water, or mix together, 10-12 egg white, ¼ kg sugar and 1 litre water. Drench once a day for one or two days.
- Seek professional help immediately if you suspect poisoning.

Cases of poisoning are difficult and expensive to cure. It is better to prevent poisoning by being careful when using poisonous substances. See table on facing page for a list of common poisons, sources, symptoms and emergency treatments

- methods**
- Brainstorming
 - Presentation

process Describe in detail common poisons and how they affect livestock – listing out the source, symptoms, and treatment for poisoning.

stop and check! Participants are able to describe common poisonous substances that affect livestock, the sources of poisons, symptoms of poisoning, and emergency treatment.

Poisons	Source	Symptoms	Emergency treatment
Arsenic	Rat poison, insecticidal dips and sprays, mischievous poisoning.	Dark, blackish diarrhoea, red mucous membrane, loss of hair, leathery skin.	None
Lead	By licking lead-painted objects. Some insecticidal sprays also have lead.	Strong-smelling diarrhoea, bellowing, blindness.	Epsom salts, 100g in 50 ml water given as drench.
Nitrate	Insecticidal sprays, young plants grown in nitrate-rich soils, accidental ingestion of nitrate fertilizers.	Blue colouring inside the mouth and eyelids, rapid and laboured breathing.	Drench with milk with egg white.
Salt poisoning	Excessive consumption of salt.	Loss of appetite, hypersensitivity, redness and dryness inside mouth and eyelids.	Drench 500 ml oil, followed by 500 ml of water. Reduce slightly for smaller animals.
Selenium	Plants growing in selenium-rich soil.	Loss of hair from mane and tail, rough horns, deformed hooves. Occurs over a period of time due to slow accumulation of selenium in the body.	No emergency treatment.
Sorghum	Young immature plants.	Convulsions, inside mouth and eyelids might turn blue, death.	Drench. Stop animals from feeding on the plants.
Lantana	Shrubs and plants of lantana.	Skin becomes sensitive and red. Animal shuns light. Suffers diarrhoea or constipation.	Drench. Remove lantana from pasture.
Fungus	Food which is stale and mouldy	Diarrhoea	Drench. Remove stale and mouldy feed
Malathion and other farm chemicals	Grazing on recently sprayed fields, or accidental contamination of food and water	Convulsions, twitching of muscles, loss of control over urination	Seek professional help.



8-7 Vaccination schedules

materials • Charts and markers

content Vaccination is the administration of antigenic material in order to artificially increase the animal's immunity. By vaccinating an animal we can either prevent a disease or reduce the effects of the disease on the animal. Mass vaccination drives have been successful in controlling several highly contagious diseases. Many vaccines require repeated doses at varied intervals to effectively retain immunity. Since many new vaccines are continually being developed, it has become necessary to schedule the vaccination to animals depending on their age and reproductive status (age specific disease vulnerability), location (especially for endemic diseases), seasons, and to avoid interference of one vaccine with another. Scheduling the vaccination also means that owners are unlikely to forget or miss vaccinations. See the following pages for indicative vaccination schedules for various livestock. Use updated information in your sessions.



2 hour

Precautions to be taken while carrying out vaccinations for livestock and poultry

- Vaccinate only healthy animals
- Use sterile, disposable needles and syringe for each animal
- Use only quality vaccine; note the date of manufacture and expiry before using the vaccine.
- Always maintain vaccines under cold chain
- Use proper diluents for diluting the vaccine
- Follow correct dose and route for vaccination
- After dilution, the vaccine should be maintained under cold chain conditions and should be used within the stipulated time period.
- Avoid vaccinating pregnant animals

Note

- Infectious bursal disease (IBD), Infectious bronchitis (IB), Infectious laryngeal tracheitis (ILT) vaccine is used only in endemic areas.
- In case of outbreak of Newcastle disease, Ranikhet disease vaccine K(RDVK) is given by subcutaneous injection or Lasota through drinking water.
- The birds should be dewormed before administration of vaccines

methods • Discussion
• Lecture

process Explain the need for periodic, planned vaccination schedules for livestock. Present the vaccination schedule for different types of livestock. Use the content above for reference – but update the same to suit the time and location. Use the vaccination schedule to recap important diseases and the need to control them.

Vaccination schedule for cattle:		Vaccination Schedule For Sheep And Goats:	
Age of vaccination	Vaccine	Age of vaccination	Vaccine
4 – 8 months	Contagious abortion S19 (Brucella abortus)	6-8 weeks before lambing	Tetanus 1 st injection
a. 4 months b. 2-4 weeks after vaccination(booster) c. Revaccination - biannual	Foot and mouth disease	2-4 weeks before lambing	Tetanus 2 nd injection Sheep pox*
6 weeks before weaning	Black quarter (BQ) 1 st inj. Anthrax	3 months and above	Sheep Pox
6 months	Black quarter 2 nd inj.	4 months revaccination done annually	Foot and mouth disease
6 months and above	Haemorrhagic Septicaemia	Before weaning	Enterotoxaemia 1 st injection Black quarter 1 st
6 months and above- revaccination annually	HS/BQ combined vaccine	6 months of age	Black quarter 2 nd injection Anthrax Enterotoxaemia 2 nd injection
		Lambhood vaccination	Johne's disease



Vaccination schedule for commercial layers			Vaccination schedule for commercial Broilers		
Age of vaccination	Vaccine	Route	Age of vaccination	Vaccine	Route
0 day	Marek's disease	Subcutaneous injection at hatchery	0 day	Marek's disease vaccine	Subcutaneous injection at hatchery
7 th day	Newcastle disease F strain/ Lasota	Eye drop or Nasal drop per chick	5-7 day	Newcastle disease F (Lentogenic type),	Eye drop method.
14 to 16 days (II) weeks	Infectious Bursal Disease (Live),	Eye drop method.	28 to 38 days	Newcastle disease vaccine Lasota	Through drinking water.
21 to 24 days (III) weeks,	Infectious Bronchitis (Live)	Eye drop method			
30 to 35 days (fifth week),	Newcastle disease Lasota strain	Eye drop method			
42 to 45 days (Sixth week),	Infectious Bursal (Live)	Eye drop method			
56 to 70 days (8 th to 10 th week),	Newcastle disease K (Mesogenic type),	Subcutaneous injection.			
84 to 91 days (12 th -13 th week	Fowl pox vaccine	Wing web puncture or intramuscular injection.			
91 to 98 days 13 to 14 th week	Infectious bronchitis	Through drinking water			
126 to 133 days 18 th to 19 th week	Newcastle disease K9 (Mesogenic type),	Subcutaneous injection.			
Every 8 weeks after peak production	Newcastle disease, Lasota vaccine	Through drinking water			



Administering drugs



module aim Paravets offer valuable services like first aid, nursing and simple drug administration. As a logical extension to the module on disease management in livestock, this module introduces participants to methods of drug administration especially for emergencies and simple ailments. The module requires considerable practice of methods and is therefore meant to be reinforced with lots of opportunities to practice under supervision of a veterinarian. The module offers participants an understanding of the mechanisms behind drug administration and skills to work with animals.

learning objectives At the end of this training module participants will be able to:

- Explain various methods of drug administration
- Describe specific places for drug administration by injection
- Explain how to effectively use equipment during treatment

module summary

Session Title	Duration
1. How to administer drugs?	1 h
2. Equipment used to administer drug	1 h
Total	2 hours

note to the trainer



This module best held in a veterinary dispensary or in a farm with the local veterinarian also in attendance

methods Presentations, demonstration and field visits

materials Charts and markers, pictures, veterinary equipment – feeding cup, syringes and needles, IV set, sterilising equipment and supplies

handouts On drug administration



9-1 How to administer drugs?

materials • Charts, markers and picture

content Drugs need to be administered to animals that are too sick to recover on their own. Paravets need to be skilled in drug administration – especially for first aid purposes before the services of a veterinarian can be sought. Drug administration is a combination of sound knowledge of drugs and animal physiology as well as a skill



1 hour

1. Oral administration method

- Liquid syrups and tablets are advocated orally

Administering liquid drugs:

- Take the medicine in the bamboo vessel or bottle
- Keep the head of the livestock slightly slanting upwards
- Open the mouth of the animal with the left hand and pull the tongue of the animal and pour the liquid/drugs slowly.
- Be very cautious that the drug should not enter in the respiratory tract as it could lead to the death of the animal.

Administering tablets:

- It is very easy when compared with liquid drugs administration.
- The tablet can be inserted into a banana fruit and given to the animal
- The tablet can be crushed and mixed with pure honey and it can be given through the tongue

Precautions to be taken before and after administration of drugs:

- Be aware that the particular drug had not produced any allergic symptoms when it was administered before
- Ensure that the drug does not enter the respiratory tract
- If the animal has difficulty swallowing the drug, stop immediately, wait a while and then try again
- When administering liquid drugs raise the animal's head only slightly and not vertically
- Use good quality banana for administering drugs
- Use only pure and unadulterated honey for administering drugs

2. Injection Method:

How to inject drugs and where?

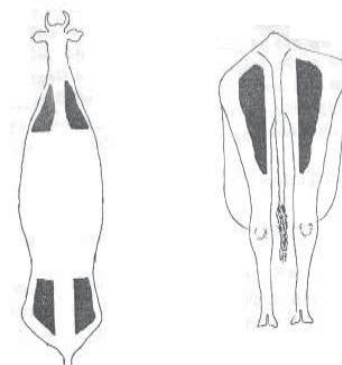
Some of the drugs which cannot be given through the mouth can be administered through injection. A few drugs will lose their efficacy because of the presence of acids in the stomach. Except stomach problems in ruminants like cattle, buffalo, sheep and goats, the drugs for other diseases are administered only through injection.

Injections are of three types:

- Intramuscular
- Intravenous
- Subcutaneous

Intramuscular method:

It is the method of administering drugs through muscles. Most drugs are administered through this method. The drugs advocated through this method will enter into the body of the animal within 30 minutes. Except for drugs given for emergency ailments all the others can be administered through this method.



Specific places for Intramuscular injection: Neck region, buttocks and thigh region (see picture). Drugs which produce less pain and oil free formulations can be injected in the neck region, but the oil formulations and painful injections should be administered only in the buttocks and thigh muscle region. Always check the injection vial to confirm mode of injecting.

Merits: This method is widely administered for all the ailments. It is very safe and simpler than other methods.

Demerits:

1. Drugs administered through this method will take 20- 30 minute to act in the body of the animal so it cannot be used in an emergency
2. Only 15 ml of drug can be injected through this method and any pain producing drugs will lead to swelling of the particular region.

Procedure for Intramuscular injection:

1. First analyse thoroughly the formulation, the type of drug and the place to be injected before administering the drugs to the animals.
2. If two or more injections are needed, decide the sequence of injections first.
3. Sterilise the needle and syringe and evacuate air from the syringe before drawing the drug into it. There should be no air bubbles in the syringe.
4. Clean the area you propose to inject with cotton dipped in spirit, tincture or any antiseptic.
5. Insert the needle on the chosen spot with slight pressure.
6. If it bleeds, remove the needle immediately and wipe the spot using antiseptic cotton till the bleeding stops. Find an alternate spot for injecting.
7. Once the needle is injected satisfactorily, place the syringe with drug on the needle and slightly pull the piston to ensure that there is no bleeding.
8. Slowly push the piston and advocate the drug
9. The animal should not move till the drug is fully injected.
10. After the injection, wipe the injected spot with disinfected cotton
11. After 6–8 hours give a hot water fomentation.



Intravenous injection:

This method is advocated mainly during emergencies. The drug administered through this method will mix with the blood immediately within 1-2 seconds but it is quickly drained out in urine. The drugs administered in emergencies and to save the animal's life should be advocated only through this method. Generally these drugs are administered through the jugular vein and other veins.



Merits

1. There is no better treatment for emergencies than this method.
2. The second after the administration, the drug reaches the blood stream and starts its action.
3. It is the right method for glucose, calcium saline, ringers lactate administration
4. Drugs that affect the skin and muscles can be injected through this method

Demerits:

1. Oily formulations of the drugs that affect the heart should not be administered by this method (e.g., Oxytetracycline)
2. Drugs inducing shock should not be administered through this method
3. Only a skilful person can use this method of injection

Procedure:

1. Turn the head away from the person administering the drug. Slightly wipe the jaw and neck of the animal with your left hand
2. There is a vein that bulges in the neck (the jugular vein); wipe along the vein with cotton dipped in tincture
3. Pierce the needle on the vein. If blood comes out through the needle when pierced it is the right position for intravenous injection otherwise try the method again
4. Ensure that there are no air bubbles in the syringe. If the drug is administered with air bubbles, it will cause a heart attack and the death of the animal



Subcutaneous Injection:

Most vaccines are administered through this method. It can take 2 hours to 2 weeks for the drug to act in to the system of the animal.

Merits:

Long acting drugs and those drugs which are prone to produce shock to the heart and swelling on the muscle can be administered through this method

Demerits:

1. This method of injection cannot be used in emergencies
2. The drugs affecting skin, should not be administered by this method



Places for subcutaneous injection:

The neck and lower stomach portion which has loose skin

Procedure:

1. First sterilise the spot where you will inject the drug.
2. Pinch the skin slightly and pull it up and inject the needle into the skin.
3. Ensure that there is no bleeding before injecting drug on the skin

- methods**
- Brainstorming
 - Lecture
 - demonstration

process Brainstorm the participants on the need to administer drugs.

Key Question: Why do we have to administer drugs to animals?

Seek responses and clarify issues

Describe various methods of drug administration with details of when a certain method is preferable, precautions to be taken before, during and after drug administration, process of drug administration and demonstrate the methods on a dummy if possible

Allow participants to try certain methods if the session is held in a veterinary clinic or in a farm. You may use placebos for oral administration

If possible, a local veterinarian could also supplement the session with practical tips

Open the floor for discussion and clarify issues and demonstrate method again if needed

stop and check! Participants are able to clearly explain the different oral and injecting methods of administering drugs. They can demonstrate the methods correctly with a dummy animal

note to the trainer Skills learnt in this session are useful for conducting animal health and vaccination camps. Make sure that the participants are reasonably skilled before they participate in such camps. Additionally, participants should also be taught to dress wounds correctly.





9-2 Equipment used to administer drugs

- materials**
- Charts and markers
 - Pictures of equipments
 - Feeding cup
 - Syringe
 - Needle
 - Intravenous set
 - Sterilising equipment

content Veterinary drug administration requires specialised equipment and supplies that are often available in pharmacies in large towns. While some are expensive and available in dispensaries, a feeding cup, injecting syringes and needles (of various sizes), intravenous sets and sterilising equipment are basic and essential. It is important to be stocked with these items at all times and in sterilised condition.

- methods**
- Presentation
 - Demonstration
 - Exposure
 - Interaction

process Brainstorm the participants on equipment and supplies used to administer drugs to livestock.

Key Question: what equipment is essential for administering drugs to animals?

Seek responses from participants and supplement with the list of essential equipment and supplies.

Describe the structure and functions of the equipment and supplies and their availability and use.

Allow participants to handle the material and seek feedback.

Open the floor for discussion and clarify concepts.

stop and check! Participants are able to correctly name drug administering equipment and supplies and describe their use.

note to the trainer Skills learnt in this session are useful for conducting animal health and vaccination camps. Make sure that the participants are reasonably skilled in using basic equipment and supplies before they participate in such camps.

Sum up the entire module – recapping the previous sessions on diseases and drug administration. In case the sessions were held in the classroom, arrange for a visit to the dispensary where the participants will be able to see and attempt some of the simpler procedures.



Traditional medicines



module aim Veterinary care is often understood as modern allopathic diagnosis and treatment methods taught to veterinarians in universities. However, livestock have been cared for by owners since thousands of years with geographically relevant knowledge gained with years of trial and error. Traditional or local or 'ethnoveterinary' medicine is the knowledge developed by local livestock holders unlike the scientific or 'allopathic' veterinary medicine taught at universities. Both systems have evolved and now complement each other. Traditional medicine has been developed by farmers in their fields and not laboratories and clinics and uses a range of locally available materials. The knowledge and skills are transferred within families or by oral tradition. It is now recognised that traditional medicine can be effective and affordable and can be provided locally. The purpose of this module is to create awareness on local treatment practices for livestock and gain skills in identifying and collecting locally available herbs for treating livestock.

learning objectives At the end of this training module participants will able to:

- Identify locally available herbs and its importance in livestock diseases management
- Explain/list the herbal treatments for various diseases in livestock

module summary

Session Title	Duration
1. Why traditional medicines?	1 h
2. Herbal treatments for livestock diseases	3 h
Total	4 hours

materials Charts and markers, local herbs, photos of herbs, ready herbal preparations

handouts Various treatment measures

methods Brainstorming, discussion, presentation, demonstration and guest lecture

guest lecture By local healers

note to the trainer



Identify local healers – especially those who specialise in livestock and invite them to conduct this module. Prepare in advance so that all materials are available for demonstration. Also discuss the overall session plan with the healers so that the sessions can be effective.



10-1 Why traditional medicines?

- materials**
- Charts and markers
 - Local herbs
 - Photos

content **Traditional or ethnoveterinary medicines:**

For many animal ailments local healers provide treatment through indigenous or local or ethnoveterinary healing practices. Many small livestock holders cannot afford high cost of allopathic treatment – which may not be available in small villages. Supplementing allopathic veterinary care with traditional medicines is considered a logical option. Centuries old traditional veterinary practices have the following advantages



1 hour

Advantages of local veterinary treatment

1. Locally available
2. Cost effective
3. Less adverse side effects
4. Easy to practice

Limitations:

- Some remedies are inconvenient to prepare or use.
- Some plants are available only at certain times of the year.
- Some treatments are ineffective
- Some practices are harmful
- Traditional diagnosis may be inadequate (identify symptoms than diseases)
- Dosages are uncertain and remedies are not standard
- Herbal medicines are often not as fast acting
- Less useful in control and treatment of epidemic diseases like FMD, HS, Anthrax, etc.

Content for the guest speaker: The local healer may design his or her session to include the following content:

1. Personal history and experience with using indigenous methods to treat livestock
2. How did the healer get trained?
3. What in his/her experience are the advantages and disadvantages of local methods of treatment
4. Historically – what is the trend with respect to the demand for local healing practices among livestock holders in the area – what are the practices that are commonly applied without the need for a special healer?

- methods**
- Brainstorming
 - Lecture
 - Guest lecture by local healers.

process Brainstorm the participants on the need for complementing veterinary care with indigenous methods of treatment.
Key Question: what is the role of local knowledge and treatment practices for veterinary care?
What are the advantages and limitations of indigenous veterinary practices?
Elicit responses from participants and introduce the topic. Define ethnoveterinary practices and list its advantages and disadvantages.
Introduce the guest speaker (local healer) who will then hold the session.

stop and check! Participants are able to define the term ethnoveterinary practices and explain the need to complement mainstream veterinary (allopathic) methods with local practices.

10-2 Herbal treatment for livestock diseases

materials ▪ Charts and markers
▪ Local herbs

note to the trainer The content in this section is indicative. While some practices can be repeated elsewhere look out for practices in your locality and modify the content accordingly. Some plants are referred to by their Tamil names.

content **Bloat:**

Animals sometimes have too much gas and fluid in their stomach. This results in bloat and other forms of indigestion.

Symptoms:

- Stomach is distended/bulged
- Discharge from the nose and eyes
- Difficulty in breathing
- Lying down and getting up often, kicking the sides of the abdomen



3 hour



Causes: Sudden change in feed material, excess intake of legumes/ grams or due to intake of feeds like kitchen waste.

Treatment:

1. Dried ginger (*Zingiber officinale*) 25 gm, pepper (*Piper nigrum*) 10 gm, betel leaves (*Piper betel*) 50 gm stems of *Pirandai* (*Cissus quadrangularis*) 200 gm. Pound and mix the above items and give orally as a bolus for three consecutive sessions. 30 minutes after every administration, administer 50 gm of salt in half a litre of warm water orally.

or

2. Asafoetida (*Ferula asafoetida*) 10 gm, dried ginger (*Zingiber officinale*) 10 gm, pepper (*Piper nigrum*) 10 gm, *Thippili* (*Piper longum*) 10 gm, palm jaggery 250 gm. Pound the ingredients and keep the same in a plantain leaf and administer orally



Worm infestation:

Clinical signs:

Animal looks dull, emaciated. Body hair appears thick. The stomach will be pot bellied in appearance, semi solid foul smelling stools with worms. Off feed.

Reason:

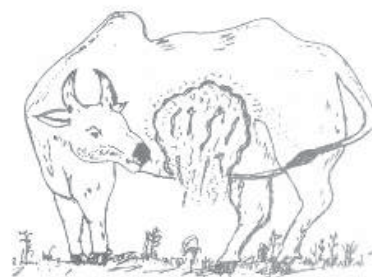
The worms enter the animal digestive system through grass while grazing during rainy season.

Treatment:

1. Oral administration of Aloevera 50-75 gm (small ruminants) and repeated after 21 days.

Or...

2. Aduthinnapalai (*Aristolochia bracteolata*) two handfuls of leaves are ground and drenched with 100 ml of neem oil



Anorexia:

Symptoms: Animal off feed, dull and inactive, frequently lying down and getting up and absence of rumination.

Reason: Fever, change of ration, infectious diseases.

Treatment:

1. Turmeric (*Curcuma longa*) 200 gm, ginger (*Zingiber officinale*) 200 gm, Karupatt/ palm sugar 250 gm, bitter gourd (*Mimordica charantia*) leaves 200 gm. Pound the above materials and give orally twice a day in the morning and evening for two days.

(or)

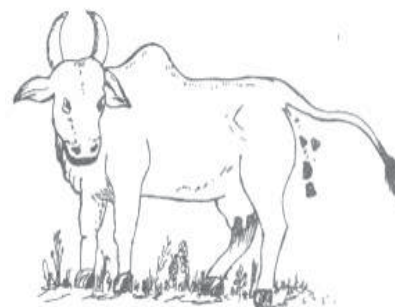
2. Pirandai (*Cissus quadrangularis*): two plants are to be rubbed on the tongue of the animal with salt

Constipation and Impaction:

Symptoms: Lack of defecation or pelleted hard faecal material voided; no rumination, animal looks dull and sick.

Reason: Fever, heat stress, lack of sufficient water and dehydration.

Treatment: Castor oil (*Ricinus communis*) 150 ml is drenched orally (or) Kuppaimani (*Acalypha indica*) two handfuls and a leaf sheath of Aloe vera are to be ground and fed.



Anoestrus and suboestrus:

Symptoms: Animals not showing regular signs of heat, repeat breeding and early embryonic mortality. At times heat signs not visible.

Reason: Nutritional deficiencies, management disorders, hormonal deficiency and uterine disorders.

Treatment:

1. Bengal gram 250 gm is soaked in water for 12 hours and tied in a cloth for 24 hours for sprouting and to be administered the next day morning. This is to be repeated once in two days until the animal comes to heat. Before giving this Aloe vera pulp is to be given for 7 days. Before insemination 100 ml Neem oil has to be administered orally.
2. Oral administration of Aloe vera 100 gm (first day). After giving Aloe vera give 300 gm of *Cissus quadrangularis* continuously for 3 days and then continue with 150 gm /cow /day for 2 weeks.

Prolapse of uterus:

A female uterus can push through the birth opening (vulva) and hang down outside. This is called prolapse. If it not corrected, the uterus will dry out and become infected. This is likely to kill the animal.

Treatment:

1. Wash the exposed uterus with clean water and apply vegetable oil on hands, push it inside.
2. Internally Thottalsinungi (*Mimosa pudica*) leaves two handful are ground well and mixed with 200 ml goats milk, to be given three times. (morning, evening, and next morning)
3. Keep the animal in a slightly slanting portion keeping the head portion in a lower level at least for a week.



Retention of placenta:

Nonshedding of placenta beyond 3-5 hours post partum.

Treatment:

1. The leaves of two sesame plants (*Sesamum indicum*) 250 gm are pounded with 1000 ml of water and drenched, placenta would be shed in about 1-2 hours' time.
- (or)
2. Horsegram (*Vigna unguiculata*) 500 gm are boiled and strained and mixed with 100 gm of palm sugar and administered orally. Placenta would be shed in about two hours' time.



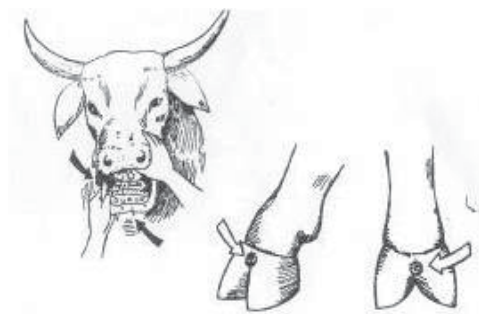


Foot and mouth disease:

Clinical signs: Ulcers in the mouth and in cleft of hooves. Drooping of saliva, off feed with fever, difficulties in walking.

Treatment:

1. Banana 5 fruits and sesame oil 100 ml are mixed and fed for a week.
2. Boiled Bajra grains 750 gm and banana 5 fruits are mixed and fed with 200 ml castor oil.



Ectoparasitic infestation:

Vasambu (*Acorus calamus*) 15 gm, dried ginger 15 gm, *Thumbai* leaves (*Leucas aspera*) 200gm, neem leaf 100 gm, neem seed 100 gm, turmeric 10 gm, garlic- 6 cloves, onion 10 gm, camphor 5gm - grind all the ingredients into a semi powder form and mixed with 5 litres of water and boil for 15 minutes. Take *Thumbai* (*Leucas aspera*) twigs and dip in the solution and apply on the affected part and wash the animal after 24 hours

(or)

Thumbai juice (*Leucas aspera*) 500 ml is kept in direct sunlight and 2 gm of camphor is added and the same is applied once in the evening. Use *Thumbai* plant to scrub the body of the animal during bathing.

Non specific Gastric enteritis

Clinical signs: Off feed, diarrhea, dull and inactive, not walking steadily

Reason: Diseases, drinking contaminated water.

Treatment: 10gm of omum (*Trachyspermum copticum* – caraway or ajwain), cumin, poppy, turmeric, pepper, tamarind, onion, garlic, 5gm of asafoetida along with salt. All the ingredients are ground and administered orally one or two times per day.

- methods**
- Lecture
 - Demonstration
 - Experience sharing
 - Discussion

process Brainstorm the participants on common local treatment for livestock
Key Question: have you used any local treatment on livestock? What did you use?
Elicit responses from participants and open the floor for a demonstration of methods by the local healer. Allow participants to handle the herbs, equipment and materials during the demonstration.

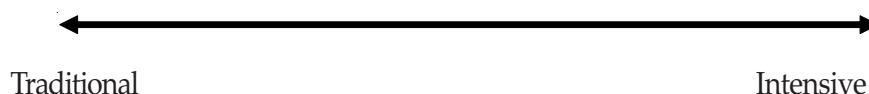
Include any treatments that have not been covered by the healer in the concluding session. Open the floor for discussions and clarify issues if any.

stop and check! Participants are able to describe local treatment methods for common ailments in livestock. They are able to identify herbs that are commonly used in local herbal medicines.

Evelyn Mathias, November 2001

Traditional versus intensive animal production

All over the world a wide spectrum of animal production systems exists. These range from 'traditional' low-input management systems in remote rural areas to 'modern' intensive production units where hundreds of animals are kept for the sole purpose of producing food for sale. Numerous variations exist between the two extremes.



The following table compares the extreme ends of the spectrum. However, we need to keep in mind that in reality only few systems will match the ends of the spectrum. Most will combine characteristics of both ends.

Source: Modified after [Hooft 1999:26](#)

Hooft, Katrien van't. 1999. Relation between ethnoveterinary and western knowledge in family-level livestock keeping (examples from Bolivia). In: E. Mathias, D. V. Rangnekar, and C. M. McCorkle, with M. Martin (eds.). *Ethnoveterinary Medicine: Alternatives for Livestock Development - Proceedings of an International Conference Held in Pune, India, 4-6 November 1997*. Volume 1: Selected Papers. BAIF Development Research Foundation, Pune, India. Pp. 25-29.

<http://www.ethnovetweb.com/>



	Traditional management	Intensive production
Goal	Minimization of risk	Maximization of profit
Means	Integration e.g., agriculture and animal production, keeping several species, placing a few animals with neighbours	Specialization and automatization e.g. chicken farm, large dairy production
Investments	Low; optimises investments rather than production	High; maximises production
Breeds	Mostly local multipurpose breeds	Mostly high performance breeds
Purpose of animal production	<ul style="list-style-type: none"> • Food, fibre, fertilizer and fuel • Cash income • Draught power and transportation • Savings account • Buffer against crop failure and other risks • Employment • A way to access and use common property • Support for the social network and culture 	<ul style="list-style-type: none"> • Production of food for sale
Effect on environment	Sustainable use of vegetation and resources which have no other use	High use of energy, production of large amounts of animal wastes
Labour/capital	Labour intensive	Capital intensive
Flexibility	High	Low
Dependence on inputs from outside	Low	High
Market orientation	Low	High

Ethnoveterinary versus modern veterinary medicine

Again, this section compares two extremes at the end of a wide spectrum. The majority of the real-life systems will be somewhere in between.

	Ethnoveterinary medicine	Modern veterinary medicine
Integration	Integration with culture, religion and other aspects of a community's life; animal healers often also treat humans, and human healers treat animals	Separation from animal husbandry, human medicine, pharmacy, and religion
Approach	Holistic: treats whole patient	Treatments often target specific organs
Diagnosis	Depends mostly on observation and the senses	Hightech methods play important role
Prevention and treatment	Stimulates immunity and improves the general condition	Seeks to control micro-organisms

resources Ethnovetweb: <http://www.ethnovetweb.com> this is a comprehensive website that has information and resources on ethnoveterinary practices.

ANTHRA <http://www.anthra.org> is an Indian NGO, founded by women veterinary scientists 1992. It focuses primarily on issues of livestock development, in the wider context of sustainable natural resource use.





Rearing small animals and poultry



module aim Small livestock – sheep, goats, swine and poultry are very important to the livelihoods of the poor. Often, resource poor livestock owners do not have strictly financial considerations for rearing small animals. However, in order to create wealth from small animals, it is important to improve management practices. The purpose of this module is to introduce participants to improved practices in animal rearing different types of small animals and poultry. Small livestock and poultry are increasingly reared on commercial farms – which are resource intensive and therefore risky for small holders; there is also increased concern about the health risks of such intensive farming. Information on rearing livestock and poultry on large scale commercial basis is readily available. It is small holders looking for backyard systems that often go without adequate technical support. This module should concentrate on concerns of such small holders while also providing exposure to various scales and intensity of livestock rearing.

- learning objectives** At the end of this training module participants will able to explain:
- Desirable features of rams and ewes
 - Feeding of different categories of sheep and goats
 - Various disease control measures for sheep and goats
 - Poultry housing and management
 - Pig rearing and management

module summary

Session Title	Duration
1. Rearing sheep	2h
2. Rearing goats	2h
3. Rearing poultry	1h
4. Rearing pigs	1h
Total	2 days

materials Charts and markers, pictures, videos

handouts Latest information on rearing small livestock and poultry – commercial, backyard systems and alternative approaches (like free range or organic)

methods Brainstorming, discussion, lectures, presentations, exposures or farm visits

field visit To see poultry, piggery, sheep and goat rearing (or any other livestock relevant for your area)

note to the trainer



This module is best conducted as a combination of one day in the classroom and one day in the field. Inform farmers early about your visit and make adequate preparations for field visits.



11-1 Rearing sheep

materials

- Charts and markers
- Picture

content

Sheep are unique among domestic livestock as they are reared for a variety of purposes and can be maintained under diverse environmental conditions, utilising uncultivable waste land and weeds from the field. Sheep rearing is a subsidiary occupation of mainly poor farmers and landless labourers. Sheep are most docile and earliest domesticated among farm animals for basic needs of food and clothing. They convert food and roughage cheaply into good cash products and fertilise land. A male sheep is called a ram, a female is called a ewe and the young is called a lamb.

Managing breeding rams:

- The ram should be a pure breed
- Select the ram for growth rate and carcass trait
- Ram should be active, vigorous and moderate in flesh
- Optimum age should be 2 years or more for breeding purpose
- Separate ram from flock for 12 hours and turn the ram to flock at night
- Retain rams as 2 to 4 percent of all males
- Cull half of the ewes and 96 percent of all rams



2 hours

Managing breeding ewes:

- Good health and vigour, active disposition, healthy look of skin.
- Structure: Ewe should be true to the type of breed, full sized with deep wide chest, strong head, back levelled, wide deep body, short legs, moderate size
- Ewe should have uniform built and slightly longer body, have roomy hind quarters with well formed udder
- Udder: Sound, smooth, soft pliable with both teats functional
- Fleece: Dense, tight, uniform quality and have ability to transmit wool characteristics to lambs
- Age: Most valuable between 2 to 2½ years, broken mouthed after 5 years and maximum useful age 6 to 7 years
- Must provide 8 lambs in 6 to 7 years
- Have good mothering ability and active foraging habits

Feeding sheep:

- Sheep have small muzzle and split upper lip helping them to nibble small blades of grass on pasture.
- Sheep prefer small tender grass.
- Sheep chew food more thoroughly than cattle.
- Excess feeding to sheep causes indigestion
- Capacity of sheep stomach is 15 to 16 litres
- Sheep do not compete with dairy cattle on pasture
- The animals should be kept on optimum nutritional status. However, over-fattening is not desirable. Common salt and mineral mixtures must be offered to stall fed animals.

Feeding of different categories of sheep

Normally sheep are grazed in open lands for about 8 hours a day. This is not sufficient to maintain their health, especially in dry seasons, in degraded lands and for pregnant animals. Feeding with concentrates can significantly improve health and productivity. In 2009, 1 kg of concentrate feed bought locally cost Rs. 10; it would cost about Rs. 2 per day to feed a pregnant ewe and Rs. 120 if fed during the last two months of gestation.

Pregnant ewes:

Gestation period of ewes is between 143 and 150 days. In the first half of gestation growth of the foetus is not so rapid and thus the maintenance requirements of nutrients can take care of pregnancy. However, avoid underfeeding during this period. During the latter half of gestation the foetus grows better if provided with better nutrition.

Ingredients	Parts/Kg
Maize/Jowar/Bajra	30
Groundnut cake/deoiled Groundnut cake	20
Rice bran/deoiled rice bran	40
Molasses	7
Mineral mixture	2
Salt	1
Total	100 parts/kg

Give about 150-250 gm/day of concentrate mixture in addition to 8-9 hours of grazing on good pasture. The advantages of extra allowance of feed given during last half of gestation are to:

- increase birth weight of lambs.
- reduce number of weak lambs
- reduce chance of lambing paralysis which occurs just before lambing.
- increase milk of ewes.

Feeding lactating ewes:

Immediately after lambing reduce concentrate ration as it could lead to conditions like swollen udder and other udder complications. During this period give good quality hay, legumes along with a smaller quantity of concentrate (about 50-100 gm a day). Lactating ewes require 800 gm of good legume-hay or 100 gm/day concentrate mixture for 75 days after lambing in addition to 8 hours of grazing.

Feeding lambs from tenth day to weaning:

Lambs aged 10 days and over will do well with good quality legumes, concentrate mixture - 50-100 gm/day with salt and mineral mixture.

Ingredients	Parts/kg
Maize	67
Groundnut cake	10
Wheat bran	10
Fish meal	10
Mineral mixture	2
Salt	1
Total	100 parts/kg



Feeding growing lambs:

Feed growing lambs good quality fodder and concentrate mixture as given below:

Ingredients	Parts
Maize	25
Groundnut cake	32
Wheat bran	40
Mineral mixture	2
Salt	1
Total	100 parts

Body weight of the animal	Concentrate mixture/day(if quality fodder is available)	Concentrate mixture/day(if quality fodder is not available)
10-15 kg	50 gm /day	300 gm
16-25 kg	100 gm/ day	400gm
26-35 kg	150 gm/ day	600 gm

Feeding breeding rams:

Rams used for breeding purpose should not be too fat; this may influence their fertility and mating behaviour. If breeding ram is fat, stop its ration of concentrate mixture feed only dry fodder

Flushing: Flushing is the special nutritional care for improving nutritional status of ewes 3-4 weeks before mating by providing additional concentrate mixture. It improves its nutrition and body condition before mating.

Feeding adult sheep:

Allow adult sheep to graze free of choice on pasture or grass land and supplement with 100gm of concentrate mixture. If legume or hay is available then concentrate mixtures are not necessary. When legumes are fed alone the chances of developing digestive disturbances increases; always add some of dry fodder like straws along with legume fodder. When sufficient pasture land is not available feed with available straw supplemented 300-400 gm of concentrate mixture is recommended.

Tips for managing sheep:

- Select breeds according to local agro climatic conditions.
- In case it is a farm, start with a ratio of 1 ram for 20 ewes
- Select animals with good body characteristics.
- Make arrangements for proper grazing, required concentrates, and clean drinking water.
- Sheds must be well ventilated and hygienic
- Breed ewes 2 times a year
- Wean the lambs at 3 months of age
- Vaccinate animals at appropriate time
- Deworm animals once in 3 months. If required, treat animals for external parasites (dipping)
- Shear the animals after winter season

- methods**
- Brainstorming
 - Lecture
 - Exposure

process Provide a quick overview of sheep rearing – its importance, important traits in sheep, breeding sheep, feeding sheep.
Allow participants to interact with sheep owners (small and large) and sheep demonstration farm managers.
Give nutrition related information as handouts for participants to refer.

stop and check! Participants are able to list the desirable traits in sheep – especially breeding rams and ewes. They can interpret the feeding requirements for various categories of sheep by using the handouts. They can list key issues in managing sheep.

11-2 Rearing goats

- materials**
- Charts and markers
 - Picture

content The goat, called a mini cow, is a multipurpose animal to provide meat, milk, hide, hair and manure for soil. In rural areas goat farming plays a vital role in providing employment. Goat farming can be a profitable occupation for a farmer and can fit well into mixed farming. A male goat is called a buck, a female is called a doe and the young is called a kid.



2 hours

Breeding management of goats

The characteristics of breeding bucks and does are similar to that of sheep

- Does attain puberty between 7 months and 1 year
- There are 2 peak breeding seasons; one from March to May and the other from September to November
- A doe in heat shows these signs - a wagging tail, frequent bleating, restlessness, anorexia; the vulva becomes oedematous and swollen; the animal mounts other goats and allows itself to be mounted by them
- The buck should be put into service when it is 10-12 months of age
- Gestation period in goats is 145 to 150 days

Housing goats in rural areas:

- The house should be clean, dry, well lit and ventilated, free from parasites, drafts, and facing east-west direction
- The house must be on higher level for easy drainage
- House should be able to provide protection from rain, cold, direct sunshine and winds
- Temperature inside remains between 15°C- 25°C. Three to five goats may be kept in one house of 2.1m in length and 1.5m in width



Care of pregnant and lactating goats:

- Diagnose pregnancy
- Feed laxative, leguminous and nutritious ration along with 450 gm of concentrate daily
- Use a separate pasture for does
- Avoid overfeeding and underfeeding to prevent metabolic disorders
- Avoid sudden changes in rations for does
- Provide ration with enough protein and minerals as per requirements according to body weight and stage of pregnancy
- Water should be available at all times
- House the pregnant doe in separate pen to avoid accidents, injuries from other animals and also to give better care
- Provide clean soft bedding material in maternity pens for pregnant goats in last 15 days of gestation.
- Reduce the concentrate mixture for goat at 100 gm/ day in last week of gestation before kidding

Care of newborn kids:

From birth to third day the kids are given mother's milk i.e., colostrum. After the third day the quantity of milk to be given to the kid is reduced to about 100 ml/day. Along with mother's milk, they are fed green tender grass, pasture or legume fodders like lucerne and cow pea.

Creep ration:

Between 7-40 days of age kids are fed 4-5 times a day, and between 40-60 days 3 times creep feeding is done. Creep feed for newborn kids can be formulated as given below.

Ingredients	Parts
Gram	20
Maize	22
Groundnut cake	35
Wheat bran	20
Mineral mixture	2.5
Salt	0.5
Total	100

Grower ration:

A kid between 3-12 months age is called a grower and duration this period the animals gains about 1/3rd of its adult body weight. Thus expected body weight at the completion of 1 year is 18-20 kg. A sample grower ration is given below.

Ingredients	Parts
Maize	50
Wheat bran	30
Groundnut cake	10
Molasses	07
Mineral mixture	02
Salt	01
Total	100

Finisher ration:

The finishing period of goat, depends upon the market demands for animals of different body weight. Generally goats are marketed at the body weight of 20-30 kg.

Ingredients	Parts
Maize	15
Jowar	15
Groundnut cake	20
Wheat bran	40
Molasses	07
Mineral mixture	02
Salt	01
Total	100

Feeding of dry goats:

If sufficient grazing facilities are available, the maintenance requirements are satisfied by sufficient hours of grazing on good quality pasture. However during shortage of pasture, 200gm of concentrate mixture should be given.

Feeding of pregnant goats:

When the doe is pregnant, great care is needed regarding feeding specially during last one third period of gestation as this is the active period of total development and near about 70-80% gain in foetus mass is achieved during this period. The requirement of protein, calcium and phosphorus is increased during this period.

Feeding of lactating goats:

For adult does in lactation give about 300-400 gm of concentrate mixture for every litre of milk produced. Additionally give 150 gm for maintenance.

Ingredients	Parts
Maize	12
Dal husk	35
Wheat bran	30
Groundnut cake	5
Molasses	5
Mineral mixture	2
Salt	1
Total	100

Ailments and its control in goats:

It is better to prevent ailments and diseases than to treat them. For this goats must be vaccinated and dewormed from time to time.

Control measures of diseases:

- Treat conditions quickly
- Segregate sick animals
- Change pasture
- Vaccinate healthy animals



- Disinfect shed where sick animals were kept
- Affected animals must be slaughtered, burnt or buried underground 6 feet deep with lime
- Properly dispose litter material
- Use antiserum in affected animals
- Quarantine affected animals
- Use foot baths
- Ensure personal hygiene so that handlers do not spread diseases themselves
- Follow approved methods of sanitation

methods

- Presentation
- Discussions
- Exposure

process Provide a quick overview of goat rearing – its importance, important traits in goats, breeding goats, feeding goats and disease management.

Allow participants to interact with goat owners or goat demonstration farm managers.

Give nutrition related information as handouts for participants to refer.

stop and check! Participants are able to list the desirable traits in goats – especially breeding bucks and does. They can interpret the feeding requirements for various categories of goats by using the handouts. They can list key issues in managing the health of goats.

11-3 Rearing poultry

materials ■ Charts and markers
■ Pictures

note to the trainer Obtain latest information on the management of commercial poultry (small or large) for the session. This information is breed and location specific – and changes especially due to diseases that affect poultry and the need for new management and vaccination schedules. While the Paravets should know about and may support commercial poultry farming, their main role is to support the poor – who cannot afford to take up large scale commercial poultry units. Paravets must be familiar with the management of backyard poultry. This session therefore provides only the outline of the contents that need to be covered. The technical information is very vast and the subject of an entire manual.



content Poultry farming in rural areas provides the local population with high quality protein (eggs and meat) and supplemental income. Poultry offers people cash incomes, something to gift, loans, manure, birds for religious rituals/sport and barter. Though, there is a trend towards commercial production of poultry and eggs worldwide, the role of small scale backyard poultry in resource poor communities is still extremely important. People who keep small numbers of birds (2-10) are usually women, children – the poorest people in their communities. Backyard poultry systems use few and no inputs and birds scavenge for food. Productivity of these birds can be very low because they are rarely fed by keepers and never medicated. Some are not even housed – they roost wherever possible in their neighbourhood. Even though desi birds have low productivity, their meat and eggs are sold at higher prices due to taste



1 hour

preferences. Some consumers do not prefer commercially grown poultry due to the high use of chemicals and antibiotics in the production. Therefore, even small improvements in the management of backyard poultry will offer better returns to smallholders.

Why do people rear poultry?

- Small initial investment
- Availability of quality chicks
- Short generation interval
- Quick, assured and better returns compared to other livestock species.

Issues to consider in managing poultry

Size and type: farmers can choose between small, backyard, free-ranging vs. large, commercial, industrial scale of poultry

Poultry housing – depends on size and type of operation

- Consider roofing, floor type, sides and roof structure, cage, battery,
- Housing requirements include factors like temperate, humidity, ventilation, light, floor space and equipment for feeding, watering, cleaning, disinfectants, disease management and security from theft and predators.

Breeding: choose between natural vs. artificial incubation – clearly understanding the advantages of each system over the other.

In commercial poultry farms the following are needed

Incubation, brooding of young chicks, grower management, layer management, specialised housing requirements, scheduling of vaccinations, moving between housing, feeding and disease management.

Disease management in backyard vs. Commercial: Provide an overview of the most appropriate disease management strategies and steps for different scales of poultry operations. Describe the hygiene requirements and the precautions for disease prevention and control.

Under each topic include matter on how small improvements can be made in backyard poultry systems to obtain better returns and reduce risks. E.g. vaccination against Ranikhet disease or candling method of identifying viable and fertile eggs.

Refer: Acamovic, T et.al (2005). Chapter 16: Poultry in E Owen, et al (ed.) (2005) Livestock and Wealth Creation: Improving the husbandry of animals kept by resource poor people in developing countries. Nottingham. NUP.

- methods**
- Lecture
 - Discussion
 - Exposure

process Provide a quick overview of poultry rearing – its importance, poultry housing, incubation, grower management, layer management, broiler management, disease control.
Allow participants to interact with poultry owners of different scales.
Give nutrition related information as handouts for participants to refer.

stop and check! Participants are able interpret the housing, feeding and disease management requirements for various categories of poultry farms by using the handouts. They can list key issues in managing the health of poultry.



11-3 Rearing pigs

- materials**
- Charts and markers
 - Pictures

content **Pig rearing:** Swine rearing in India is carried out under a variety of adverse social, climatic and environmental conditions. Though it is not very relevant to Erode district, there are parts of the country – such as northeast India where pig rearing is an important activity. There are very few large pig farms and most pigs are left to scavenge in the village. Scavenging, while providing cleaning services for the village, creates conditions for diseases for both pigs and humans. Hygienic management and low-cost stall rearing of pigs is to be encouraged. The male pig is called boar, the female a sow, a young one is a piglet, a sow before breeding is called a gilt.



1 hour

Advantages of pig rearing in India:

- Efficient converter of concentrates into meat
- Quick and net high returns because of 6 months of market age.
- Rapid expansion of enterprise than cattle and sheep
- Relatively less investment on equipment, sheds, herd.
- Exotic breeds being more prolific may produce two litters per year and about 8 to 12 piglets per farrowing.

Selection of Sows:

1. Sow must be from a litter whose litter size and weight at birth and weaning weight is maximum
2. Have minimum back fat thickness
3. Sow must have well developed udder with twelve teats and at least six teats in each row evenly distributed on belly sides
4. Teat of sow must be free from any abnormality
5. Sow must have deep body

Guidelines for normal reproduction of pigs:

Age at puberty	6 to 7 months
Breeding age of gilts	10 to 12 months
Breeding age of boar	At 90 to 100 kg of body weight
Breeding of sows	At 18 to 24 months
Number of sows per boar	10
Heat cycle	19- 23 days(average 21 days)
Heat period	2- 3 days
Mating time	1 st day of heat in gilts and 2 nd day of onset of heat in sows
No. of services per conception	Two at interval of 12 to 14 hours
Gestation period	112- 114 days

Management of breeding pigs:

- Feed gilts and dry sows liberally to increase energy intake 10 to 15 days prior to mating (flushing)
- Give extra allowance of grains and multivitamin injection along with flushing

Care and management of gilts and sows:

- Maturity of gilts is more important than its age. Larger litter usually results from gilts bred during their third heat period.
- It is better to purchase a sow that has been already bred at least once.
- Flush the gilt or sows to make sure a gain of about 500 gm per day during two weeks before breeding. It helps to increase shedding of more number of ova and thus increase litter size.
- Heat period in sows last for 2-3 days these should be mated second day of heat preferably second service of at 12- 24 hours interval

Care and management of pregnant animals:

- Record the date of mating to determine expected date of farrowing because swine have a short gestation period.
- Provide separate sty of about 3m² for each sow
- Keep the sty clean, dry and non slippery.
- Liberally feed and treat kindly
- Do not mix pregnant sow with other animals; they may fight and this could lead to abortions.

Care of piglets:

- Remove the piglets soon after they are farrowed
- Clean all piglets and make their body dry.
- Make sure that breathing passages of all baby pigs are clear
- Cut the navel cord with sterilised scissors leaving 3 cm from navel and disinfect by applying tincture of iodine
- Allow piglet to suckle milk from mother sow for about 8 to 10 times in 24 hours initially
- Piglet anaemia is a major problem and is solved by spraying the sow's udder with ferrous sulphate or intramuscular iron injections to piglets

Sanitation and comfort:

Pigs are preferably transported in pens. Sanitation includes adequate ventilation, proper lighting, adequate drainage (helped by providing raised housing), proper cleaning, and proper disinfection. Pigs are sensitive to heat and pens are usually North-South oriented to reduce direct exposure to sun. Providing soft bedding material (like hay or wood shavings) is beneficial especially in cold areas.

Health: Pigs are sensitive to diseases like swine fever, FMD, anthrax, brucellosis etc. Preventing contact with vectors and good hygiene are important for prevention – especially as some diseases can also be zoonotic (like swine flu).

- methods**
- Lecture
 - Exposure



process Provide a quick overview of swine rearing – its importance, traits in swine, breeding gilts/sows and boars, feeding swine and sanitation, and management issues.

Allow participants to interact with piggery owners.

Give nutrition related information as handouts for participants to refer.

stop and check! Participants are able to list the desirable traits in swine – especially breeding gilts/sows and boars. They can interpret the feeding requirements for various categories of swine by using the handouts. They can list key issues in managing the health of swine.

.....

note to the trainer



Recap the entire module when you return from the field. Open the floor for discussions on various rearing methods. Enable further opportunities to interact with farms in case participants feel the need for better understanding.

resources Chapters 16, 18, 19, 20: E Owen, et al (ed.) (2005) Livestock and Wealth Creation: Improving the husbandry of animals kept by resource poor people in developing countries. Nottingham. NUP.

IIRR (1996) Environmentally Sound Technologies for Women in Agriculture. Cavite.
The html version is available on <http://www.mamud.com/techwomen.htm>

Organic Vet: <http://www.organicvet.co.uk/> A Compendium of Animal Health and Welfare in Organic Farming – has alternative methods for rearing livestock though in a western context.

Bill Mollison (1990): Permaculture: a designer's manual: Deccan Development Society – See sections 11.12, 12.11 and chapter 13 for ideas of livestock and aquaculture in Permaculture systems.



Extension



module aim Paravets are entrepreneurs who also play a social-oriented role of facilitating knowledge-sharing. Reaching out to people to enhance their knowledge, skills and abilities is called extension. The purpose of this module is to introduce the participants to the goals and techniques of extension and to expose them to ways in which these techniques can be used in different situations. Extension as a process has evolved from traditional university centric top-down approach - to a participatory, bottom-up, learner centred one. Effective extension therefore relies on appropriate attitudes towards people and the ability to choose methods depending on the situation. This Module must be followed by the module on PRA and linkages.

learning objectives

- Define extension.
- List the purposes of extension
- Describe various techniques in extension and their features

module summary

Session Title	Duration
1. Why do we need extension?	1 h
2. Extension methods	1 h
Total	2 hours

materials Charts and markers, presentation slides

methods Lecture, presentations, discussions

resources Agricultural and Rural Extension Worldwide: Options for Institutional Reform in the Developing Countries: (FAO, 2001) Prepared by William M Rivera. <http://ftp.fao.org/docrep/fao/004/y2709e/y2709e.pdf>



12-1 Why do we need extension?

- materials**
- Charts and markers
 - Presentation slides

content **What does extension mean?**

The word extension is derived from the Latin roots 'Ex' meaning out and 'tensio' meaning stretching. 'Stretching out' or 'reaching out' is the meaning of extension. The word extension signifies an out of school system of education.



1 hour

Extension (as applicable to agriculture and animal husbandry) was known as the application of scientific research and new knowledge to farming practices through farmer education. It now includes a number of communication and learning activities organised for people by professionals and practising farmers/livestock holders from different disciplines. Extension used to be top-down – transferring skills and knowledge to the farmer by the universities, it now recognises that farmers also have knowledge and cannot be passive learners. In 2004 (Leeuwis, C. and van den Ban) extension was defined as 'a series of embedded communicative interventions that are meant, among others, to develop and/or induce innovations which supposedly help to resolve problematic situations'.¹ Extension in agriculture or livestock management is not limited to production processes only – it includes aspects of input management, marketing, and off-farm activities.

Education is an integral part of extension. Education is the production of desirable changes in knowledge, attitude and skills, either in all or one or more facets of human behaviour. The fundamental objective of extension is the development of people. The general needs for extension are:

1. To assist people to discover and analyse their problems, their felt and unfelt needs and their strengths
2. To develop leadership among people and help them in organising groups to solve the problems.
3. To disseminate information based on research and/practical experience, in such a manner that the people would accept it and put it into actual practice.
4. To keep the research workers informed of the people's problems from time to time, so that they may offer solutions based on necessary research.
5. To assist the people in mobilising and utilising the resources which they have and which they need from outside.

Different approaches are used for various objectives of extension¹ as given below:

- Technology Transfer: usually top-down, the approach delivers specific recommendations to participants about practices they should adopt
- Advisory Work: More common these days, this uses participatory approaches to promote predetermined packages of technology
- Human Resources Development: This is also a top down approach, where information

¹http://en.wikipedia.org/wiki/Agricultural_extension

is passed on, but the participants are free to decide on how they will apply that knowledge (if they wish to)

- Facilitation for Empowerment. This is the new thinking which involves experiential learning and farmer-to-farmer exchanges such as farmer field schools and participatory technology development. Here knowledge is gained through interactive processes and participants are encouraged to make their own decisions. Also the participants have expanded to include the farmer, the spouse, family, input suppliers, etc.

What role do Paravets play in livestock extension?

Paravets are in close contact with livestock holders, especially small holders. This offers a good opportunity to create regular awareness on livestock related matters, provide practical support to livestock holders in times of disease outbreak, camps, and better livestock management. If Paravets become familiar with some extension methods (especially participatory ones) there can be greater mutual learning and strengthening of the sector.

- methods**
- Brainstorming
 - Discussions
 - Presentation

process Define 'extension' using content. Describe the evolution of the term extension from top-down university centric concept to a participatory one.

Brainstorm participants on the objectives of extension and their role in extension.

Key Question:

'Why is extension important in livestock development?'

Indicative answers:

'Because, livestock owners may not have awareness'

'to pass on new ideas'

'to reach out to people in times of emergencies – like outbreak of diseases'

Describe the typical objectives of extension and the different approaches to extension depending on the need.

Key Question: What is the role of a Paravet in livestock extension?

Open the floor for discussion on the objectives of extension and a Paravet's role in extension. Try to recount previous experiences when the participants were involved in extension work and reflect on those situations.

stop and check! Participants are able to define extension, especially participatory extension and describe the various objectives of extension. They can explain their role as extension agents.





12-2 Extension methods

- materials**
- Charts and markers
 - Presentation slides

content Extension uses a large number of communication methods and approaches to achieve its objectives. It is understood that no extension worker can be equally skilled in all techniques nor it is possible to use one single method in all situations. Also no one method can reach all the audience. Behavioural changes required on the part of learners may also need several exposures with the same, different or a combination of techniques or media mix required for effective learning. However, a good understanding of different methods will help an extension worker to choose the best one for the given situation.



1 hour

Classification:

Several classifications of extension methods exist. The lists are given below.

Extension techniques according to use (after Wilson and Gallup, 1955)	
<p>1. Individual contact:</p> <ul style="list-style-type: none"> ▪ Farm and home visits ▪ Personal letters ▪ Office calls ▪ Flag method ▪ Veterinary clinic ▪ Farming Systems Development ▪ Farmer Exchange methods <p>2. Group contact:</p> <ul style="list-style-type: none"> ▪ Group meetings ▪ Method demonstration ▪ Result demonstration ▪ Conducted tours ▪ Training ▪ Camps ▪ Farmer Field Schools ▪ Farmer Exchange Methods 	<p>3. Mass contact:</p> <p>a) Broadcast media</p> <ul style="list-style-type: none"> ▪ Radio ▪ Televisions <p>b) Printed media</p> <ul style="list-style-type: none"> ▪ Journals ▪ Extension pamphlets ▪ Bulletins ▪ Leaflets ▪ Circular letters <p>c) Screen media</p> <ul style="list-style-type: none"> ▪ Slides ▪ Film ▪ Movies ▪ Video recordings <p>d) Others</p> <ul style="list-style-type: none"> ▪ Exhibitions ▪ Campaigns ▪ Farmers' fairs ▪ PRA

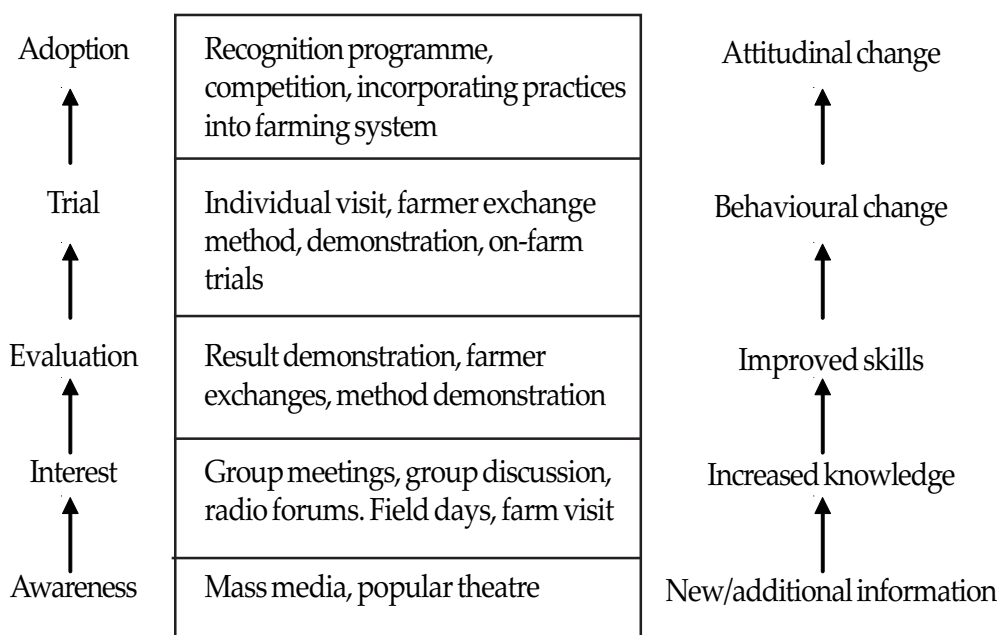
note to the trainer



A short description of each method may be given to participants. It will help if participants were introduced to these concepts during their field visits. Use matter from the resources mentioned in this Module for the content.

² <http://www.fao.org/DOCREP/W5830E/w5830e0a.htm>

Recommended extension methods for use at different stages of adoption² are given in the figure below.



- methods**
- Brainstorming
 - Presentation
 - Discussions

process Brainstorm the participants on the methods for extension.

Key Question:

‘In what ways can extension be carried out?’

Indicative Answers:

‘by making farm visits’

‘by calling for formal training’

‘through camps’

Etc.

Describe the classification of extension methods and some of the key techniques. Stress on newer and participatory approaches like farmer field schools.

Open the floor for discussions around methods and their advantages and disadvantages.

stop and check! Participants are able to list various techniques of extension and describe key techniques. They are able to suggest the appropriate techniques for different stages of adoption of practices.

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Participatory Rural Appraisal



module aim Learning from and with people will provide the greatest opportunities for Paravets to grow as professionals. Though most participants in the programme come from rural backgrounds, they would need to abilities to reflect on their values, their attitudes, and analysis and facilitation skills. Participatory Rural Appraisal is introduced to participants in preparation to the many field based learning activities that they will involve in during the course and later in their professional life. The aim of this module is to introduce systematic approaches to participate in communities and facilitate mutual learning as Paravets.

learning objectives At the end of this training module the participants will be able to

- Define PRA and its aims
- Explain key tools and methods of PRA
- List some of the dos and don'ts of PRA
- Prepare a checklist for an actual PRA exercise

module summary

Session Title	Duration
1. Why PRA?	1 h
2. PRA methods	3 h
3. Dos and don'ts in PRA	1 h
4. Preparing for a PRA	1 h
Total	1 day

materials Charts and markers, presentation slides, pictures, video – Myrada PRA Film

handouts Basics of PRA and PRA exercises

methods Brainstorming, discussions, presentations, role play, fishbowl exercise, video

note to the trainer



PRA exercises must be held immediately so that participants can practise their skills and reinforce their learning. The PRA exercises may be conducted in villages where your institute intends to work more closely – so that unnecessary expectations are not created.

resources Essential Readings:
MYRADA PRA/PALM Series No. 1 and 4f at http://www.myrada.org/series_pra.htm

C Heffernann, et al (2005) Chapter 4 The Livestock and Poverty Assessment Methodology: an Overview in E Owen et al (ed.) Livestock and Wealth Creation: Improving the husbandry of animals kept by resource poor people in developing countries. Nottingham. NUP



13-1 Why PRA?

- materials**
- Charts and markers
 - Presentation slides with photos of PRA exercises
 - Results of previous PRA exercises in the form of charts

content How do we understand the world around us?

In the past it was felt that people who were poor, rural or illiterate poor did not know what was good for them. Only knowledge that came from universities and with experts was considered valuable. Experts used to develop theories about an issues and then try to understand it on the field with long and boring questionnaires they designed themselves. Whatever was learnt through this method was not shared with people who had responded to the study. Experts used the information to decide on projects that were best for the local people – without consulting them. Programmes meant for the ‘betterment’ of the people often failed as important local knowledge and people’s priorities and situations were not considered. These failures forced people to find new ways to working with people. Participation, or greater involvement of people in understanding their situation and developing how they want to go about improving it required new methods and tools and different attitudes of people who come from outside. PRA – Participatory Rural Appraisal is one of the many approaches that were developed to effectively work with people in understanding situations, reflecting upon it and taking action.



1 hour

What is PRA?

PRA – is participatory rural appraisal; also known as PLA – participatory learning and action, or PALM – Participatory learning methods

- PRA is semi structured and relatively quick way of learning with people about their situation, problems and opportunities.
- In order to learn with the people we need to develop certain attitudes that are important to support people’s participation, innovation, opinions and aspirations.
- The objectives of PRA are to arrive at an agreed set of possibilities for development which could further lead to join participation and mutual support in implementation, monitoring and evaluation.

PRA aims to¹:

- Allow us to learn from people
- Get beyond the standard ideas and answers
- Challenge our biases in understanding situations
- Be quick, adequate and flexible in learning
- Get away from main roads and deep into rural areas
- Avoid over collecting data (optimal ignorance)
- Accept a degree of inaccuracy (appropriate imprecision)
- Include different ways of understanding the same thing... (triangulation)

¹ Relaxed and Participatory Appraisal: Notes on Practical Approaches and Methods for Participants in PRA/PLA related Familiarisation Workshops:

http://www.idrc.ca/uploads/user-S/11491553671Reader_1_PRA_notes.pdf

In livestock management - PRA supports us to answer these questions (adapted from Heffernan et al (2005))

- How important are livestock to livelihoods and well being, now and in the past?
- Who are the resource-poor livestock holders and how many are they?
- What are the major issues in animal health and production in the local area?
- Is the planned livestock intervention (let us say a vaccination programme or a new training topic) the most appropriate one for the area?

methods

- Brainstorming
- Discussion
- Presentation

process Brainstorm on how people understand the world around them.

Key Question:

‘How do you understand what is happening in a village where you want to work?’ ‘How do you find out what a livestock owner is looking forward to?’

Indicative answers:

‘we will talk to people’

‘we will do a survey’

‘we will ask a leader in the local area’

‘I know already – I am from a similar village’

Introduce the concept of PRA and compare PRA with traditional structured methodologies like surveys.

Open up discussions around mutual learning.

Explain the aims of PRA.

Show photos and videos of actual PRA exercises to illustrate points.

Open up the floor for discussions.

Sum up recapping the contents of the session.

stop and check! Participants should be able to compare traditional structured ways of understanding the world versus participatory means like PRA.
Participants should be able to explain the aims of PRA.





13-2 PRA methods

- materials**
- Charts and markers
 - Presentation slides with photos
 - Charts with results of previous PRA exercises

- content** Refer to Myrada PRA PALM Series No. 1 at www.myrada.org for more information. Participatory Rural Appraisal uses several techniques and methods to interact with people. These methods are usually very visual and require active listening. Some of the exercises are:
- Social mapping and Resource mapping
 - Seasonality
 - Resource outflow and inflow
 - Venn diagramming
 - Time line
 - Transect walking
 - Matrix ranking and scoring
 - Wealth ranking
 - Need analysis
 - Problem tree analysis
 - Trend analysis



3 hours

1. Social mapping/Resource Mapping:

This is the construction of a map of village area using rangoli powder or chalk on the ground or a cement floor to understand the village layout, main features such as housing, temples, stores, and other infrastructures and also other resources like forest, waterways, grazing land, etc.

Purpose:

- To get an impression of the social and physical layout of the villages and perceived by inhabitants themselves.
- To understand globally the social structures of the village, who lives where, what livestock they possess, what facilities are there, where they are located.
- To get an impression of the natural resources environment of the villages as perceived by the people - for livestock management the location and extent of grazing land, fodder, markets, etc..

2. Seasonality:

Through seasonality exercises, we can understand the seasonal variations in any activity as well as seasonal factors affecting any issues – for example infectious diseases, availability of water and fodder.

Purpose:

- To plan livestock interventions by studying seasonal patterns in rainfall / pest and diseases / market / milk production, etc.
- To plan for employment generation activities by studying labour availability pattern etc.

3. Resource outflow and inflow:

This exercise is a useful starting point for understanding the village economy and planning development interventions. In particular - to identify those products and services that are currently 'imported' into

Purpose: To understand the inflow and outflow of various resources pertaining to a village, a family, a business, etc. Resources can include both human and material resources.

4. Observation:

It has been observed in some of the villages that local people have evolved indigenous technologies for solving the problems of animal husbandry, soil erosion, etc. The Paravets may have to learn a lot from the village community and unlearn some of their orthodox views and theoretical presumption about peoples capabilities.

5. Venn diagramming:

It is a visual exercise that shows interrelationships between different agencies and the strength of these relationships.

Purpose: To know livestock owners' access the services from different institutions and how people prioritise which source to tap and why. Venn Diagrams help to understand the relationship with different institutions and how to build people's linkage with other appropriate institutions.

6. Matrix Ranking:

This is a visual exercise that allows people to rank one issue or item relative to another, using various criteria and thus show their priorities and preferences.

Purpose: To understand how livestock holders prefer one item relative to another and find the most preferred options in a given situation. Matrix ranking can be used to see which animal or breed of animal people prefer to keep, what fodder species they would like to plant, etc.

methods

- Presentation
- Video
- Discussions
- Role play

Present various methods and techniques of PRA using photos and pictures – showing both process and outcomes of these exercises.

process

Show a film on PRA methods.

If required ask participants to role play and try out some of the exercises.

Seek questions and provide clarifications on each method. Stress especially on methods that you will be conducting on the field.

Participants are able to explain the purpose and features of key PRA methods.

stop and check!

note to the trainer

Try to record PRA exercises whenever you conduct them on the field. These simple videos will make excellent learning materials.



13-3 Dos and don'ts in PRA

- materials**
- Charts and markers
 - Video

content Participatory learning requires unlearning of certain attitudes and ways of functioning, and learning ways to respect others and learn from them. Therefore understanding the dos and don'ts of PRA are important. These dos and don'ts must be practised and for this participants should be aware of their own behaviour



1 hour

PRA Dos:

- Do feel that you are a learner - leave status, achievements, and experience behind.
- Do show your interest and enthusiasm in learning from people; recognise and respect people and their knowledge
- Do be sensitive to the moods of others (anger, boredom, hurt, anguish, enthusiasm, etc.) and build on it
- Do follow protocol as required by the situation. Make prior appointments with the interviewer/informants as you would do for other important people
- Do create an atmosphere of confidence, trust and enjoyment, women especially should feel like expressing themselves.
- Do remember that everyone has something to say involve the silent ones, especially women
- Do listen carefully and facilitate information flow
- Do terminate bad interviews; try to analysis (later) what went wrong
- Do record the names of the participants in the exercise and given them credit for the information they give

PRA Don'ts:

- Don't feel superior to the others
- Don't think that there is nothing more for you to learn; don't hesitate to ask people for advice
- Don't hesitate to clear your doubts and curiosities with the farmers, but don't do it in an ignorant manner
- Don't take the people for granted, treat them with respect
- Don't blunder about confused
- Don't interrupt; it disturbs the flow of thought
- Don't forget to say 'thanks' or show your gratitude in other culturally appropriate ways.

- methods**
- Brainstorming
 - Role play with fishbowl
 - Discussion
 - Presentation

process Brainstorm on the attitudes required to learn in a participatory way.
Key Question: 'What are some of the dos and don'ts when you are learning together with livestock holders?'
Indicative Answers:

stop and check!

- ‘respect people’
- ‘address them by their name’
- ‘sit on the same level as them’
- ‘use language that they can understand’
- ‘don’t have side talk when someone else is speaking’
- ‘don’t speak to only men in the community’
- ‘don’t lecture’

Conduct role plays where some participants assume roles as outsiders, some as local community members and the others as observers of the fishbowl. Conduct a few simple PRA exercises (like Venn Diagramming)

After the exercise ask the observers to point out correct and incorrect behaviour among those playing the outsider role. Similarly take feedback from other participants.

Present the dos and don’ts of PRA.

Open the floor for discussions.

Participants are able to explain the dos and don’ts in PRA and correctly identify such behaviour during role plays.

13-4 Preparing for a PRA

- materials** • Charts and markers
• PRA checklist as handouts

content Preparing for the field requires work in three areas:

1. Mental preparation: the facilitators should be clear why they are conducting the PRA, check whether they are prepared to face the participants from the local community, know what they are going to tell them and how. There should be no hidden agenda.
2. Physical elements: Importantly, these aspects include the community – have they been informed, have permissions been taken, are venues ready, has food and accommodation been arranged, do local people know what they need to prepare for in advance (e.g., if they are cooking for the team), what about transport, are the materials ready, what about readiness in case of some unexpected events (like death in the village or rain, or conflict)
3. The team itself: are the participants divided into teams and in each team who does what (responsibilities for documentation, interviewing, observation), what about gender composition of teams.



1 hour

Apart from the general preparation, each team must prepare a checklist for each PRA exercise they intend to conduct. Look at the following aspects:

- Objective of the exercise
- Materials required
- Team Members and their responsibilities
- Formats for collating data from the exercise



An example is given below:

Seasonality Exercise

Objective of the Exercise: To explore the seasonality of livestock diseases in Oruthi Village

Materials required: Small strips of paper, pens, markers, locally available twigs, seeds, stones etc.

Team Members: Alamelu - Interviewer, Alagesan- observer, Asha and Arul - Documenters,

Format for the exercise:

Month	Diseases	Livestock affected
January		
February		
March		
April		
May		
...		

- methods**
- Subgroup discussion
 - Presentation

process Introduce the aspects of preparation for a PRA exercise using content.

Divide the participants into subgroups and assign them to prepare a checklist for each of the exercises that will be conducted in the field.

Ask the subgroups to present their checklist in the plenary. Seek feedback and suggestions from other subgroups. Supplement and correct aspects of each checklist.

Sum up the session and provide instructions for the actual field exercise (if already known).

stop and check! Participants should be able to develop comprehensive checklists for PRA exercises on the field.

Sum up the entire module and recap key points.

Follow up the Module with an actual exercise at the earliest.

field visit Select a village where your agency is planning to support livestock related initiatives or villages where participants of the course will operate after their training. Consult with the people in the



village well in advance about the exercise and find a time that is suitable for participation of men and women of the village. Prepare for logistics of the exercise – transport, food and accommodation, materials, documentation, common spaces and the need for public address systems, etc. Confirm participation and anticipate the approximate number of participants both from your side as well as from the village. Choose only those exercises that are relevant for both your group and the participants from the village. Orient participants of the course about the exact nature of the exercises, the behaviour expected of them and prepare for contingencies.



Building relations and networks



module aim No person or group can function and survive in isolation. Linking with others is an essential aspect of a society that shows specialisation of occupations and activities and relies on coordinated action in most spheres. Paravets play an important role in the livelihoods of rural families, especially the poor. Unlike formal veterinary care institutions that are well known, Paravets tend to be small entrepreneurs who provide much needed services and who link livestock owners to formal systems when required. As entrepreneurs, they need to develop their practice through the goodwill of the people they serve. Building rapport and good relations with the community and community based organisations may not come easily to all. This module hopes to enable participants to appreciate the need for building good relations within their work area and equip them with methods that would help them create good networks with the government, private sector, civil society actors and local families.

learning objectives

At the end of this training module participants will be able to:

- Explain what are linkages and why a Paravet needs to link with different actors
- List some of the criteria to form strong linkages with others
- Describe various tools and techniques for build rapport with the community
- Describe the different types of community based organisations in their work area

module summary

Session Title	Duration
1. Why linkages?	1 h
2. How to build linkages?	1 h
3. Good rapport with the community	30 m
4. Organisations in my area – CBOs and others	1 h 30 m
Total	4 hours

materials Charts and markers, presentation slides, videos on community based organisations

methods Brainstorming, discussion, lectures, video show

note to the trainer



The nature of community based organisations differs from place to place. Adapt this module to suit your area. Also supplement with practical exercises on communication during actual visits to farms, government offices, panchayat offices, private sector organisations, NGOs, Grama Sabha meetings, animal health camps and PRA.

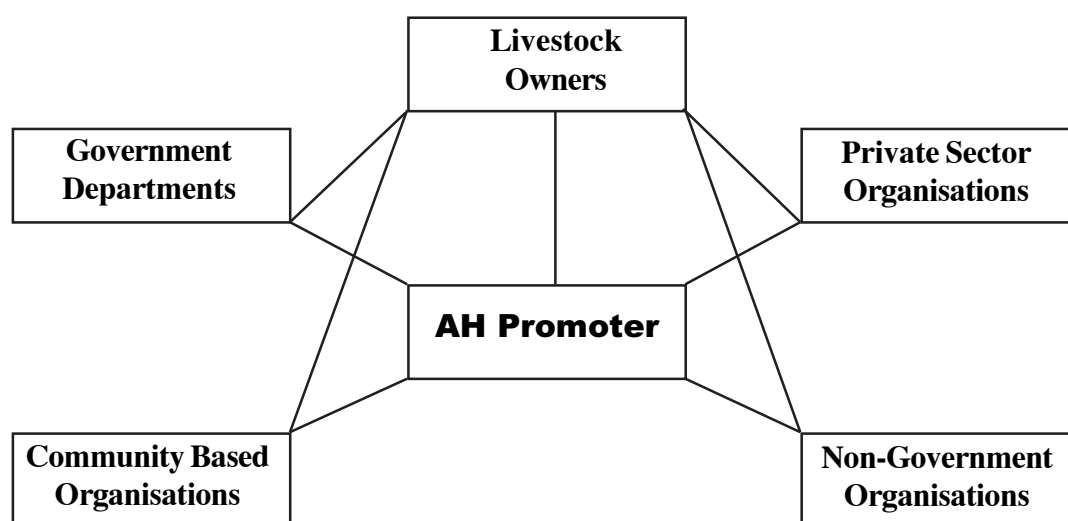


14-1 Why linkages?

materials • Charts and markers

content When any individual or organisation develops formal or informal relationships with another entity, we call it a linkage. Livestock development requires strong links to be developed between livestock holders, veterinary health care providers, animal feed suppliers, finance institutions, insurance providers, markets for milk, meat, eggs and by-products like fertilisers, leather and wool, information providers, trainers and equipment manufacturers. These linkages may be with the government, private and not-for-profit sectors. The AH Promoter is both an entrepreneur and a facilitator of livestock development. He or she thus needs to build strong linkages with these different entities for him/herself and for clients. E.g. the AH Promoter needs to link with the district milk union for providing Artificial Insemination services; at the same time, he/she could link a dairy farmer with a local supermarket to supply fresh paneer. Creating strong linkages will ensure that the AH Promotion activities will sustain and the local economy becomes stronger.


1 hour



- To provide need based services. By linking up with various actors duplication of services can be avoided and the best of competencies can be used.
- To mobilise resources for the AH Promoter and Livestock holders
- To share information and ideas – in a timely manner and in a way that all can understand and take action
- To lobby for a common purpose – especially with the government – so that actions that support a vast majority of livestock holders can be taken up
- To resist exploitation by powerful entities – especially in marketing. Joining up poor people's organisations is especially helpful here.
- For enhancing knowledge and skills of the AH Promoter – through training, exposure visits, internships and information
- To enhance the sustainability of AH Promotion activities. With linkages these activities will not be overly dependent on a few promoters.

- methods**
- Brainstorming
 - Discussions
 - Lecture

process Explain what is meant by a linkage.

Brainstorm the participants on the different entities involved in livestock development and the need for linkages with them.

Key Question: 'which are the agencies that are involved in livestock development?'

Indicative Answers: 'the government veterinary department'

'animal feed shops'

'milk dairy', etc.

Describe various government, private, non-government and individual agents involved in livestock development.

Key Question: Why does an AH Promoter need to link with other institutions?

Indicative Answers: 'to get support and resources'

'to avail of special schemes for the poor and the self-employed'

'to develop a close contact with government and businesses'

'to help livestock owners improve their activities'

Open up discussion on the topic and seek more responses. Sum up with matter in the content.

stop and check! Participants are able to explain why linkages should be built with other agencies.

14-2 How to build linkages?

materials • Charts and markers

content The need for linkages between entities is understood. But every entity must be prepared to build linkages. It is possible to build linkages with entities with credibility. The AH Promoter needs to fulfil certain criteria to link with others.



1 hour

- Professionalism: The AH Promoter should function with best of his/her abilities, providing quality and in time services. Good money management is important – services must be provided at costs that are affordable to poor livestock holders, earnings must be recorded and managed well. If resources are raised through linkages, the AH Promoter is responsible for its proper management. Professionalism will enhance the AH Promoter's reputation.
- Good rapport: The AH Promoter should be capable and willing to develop cordial and constructive relationships with a diverse set of entities. This comes from good rapport that is built up over time and skills of organising.
- A positive outlook: Having a positive outlook helps build linkages with agencies that are not always open for cooperation. The positive outlook that people can be helped if much



needed resources can be released from entities that possess them is a must.

- Good documentation: Most formal linkages require good bookkeeping and record maintenance. This is a skill that can be learnt by the AH promoter. The discipline of maintaining records should also be built up.

- methods**
- Subgroup discussion
 - Presentation

process Brainstorm the participants on what is required to build linkages.

Key Question: 'what are the requirements for an AH Promoter to build linkages?'

Indicative Answers:

- Ability to work well
- Friendly nature
- Persistence
- Good report writing
- Support from NGO

Open up the discussion on the question. Sum up the session covering any left-out points.

stop and check! The participants are able to list key criteria to help an AH Promoter to build linkages.

14-3 Good rapport with the community

materials • Charts and markers

content Why build rapport with the community?

The AH Promoter is the eyes and ears of the veterinarian at the community level. The AH Promoter is not a qualified veterinarian but is responsible for providing animal health care and animal production advice to people in their communities. Since AH Promoters deal with animals that are prized possessions of people, they should be trusted by people and in order to work well with people, the Promoters should know people very well.



30 mins

How to build rapport with the community? In order to build good relations an AH Promoter should:

- Visit the field frequently: these interactions with community will enhance the relationships with different members of the community
- Make home/farm visits
- Participate in functions and events in the village: By attending functions in the community the AH Promoter becomes familiar and gain people's respect.
- Attend Grama Sabhas and meetings of community based organisations – this provides opportunities to discuss animal health care issues and organise logistics for camps.
- Render timely services when called: this increases one's reputation and respect and creates demand for services.
- Display appropriate behaviour and approach: a positive attitude and approach makes one approachable

- Show commitment and involvement in work
- Be open – respect others’ views, learn and be transparent in word and deed; this makes one approachable and people feel free to call one the AH Promoter’s services. An open attitude also helps one learn and gain more experience.

methods ▪ Brainstorming
▪ Lecture

process Brainstorm with participants on the need for good rapport with the community and how one can do it.

Key Questions: ‘why does an AH Promoter need to build good rapport in the community?’

‘How can an AH Promoter build good relations in the community?’

Explain the need to build rapport – by supplementing participants’ responses with material in the content. Explain the methods of building rapport, describing how each method builds the reputation of an AH Promoter.

stop and check! Participants are able to explain the importance of good rapport in their work areas. They are able to list out methods that help build their rapport and reputation.

14-4 Types of community based groups

materials ▪ Charts and markers
▪ Presentation slides with photos of different types of CBOs

content Types of community based groups:

Rural areas in India have many types of community based groups both formal and informal. It is difficult to extend veterinary services to individuals in a large community, but the presence of groups enables Paravets to reach a larger audience more effectively. These groups also provide voluntary effort and contribute labour, money and in-kind resources in events such as animal health camps. Some of the important community based organisations in Erode district are:



**1 hour
30 mins**

1. Self help (affinity) groups - SHGs:

An SHG is small (15-20 members), generally homogeneous and bound by affinity; it is a group whose members use savings credit and social involvement as instrument of empowerment. SHG members often take loans for livestock development. They are a key target group for Paravets.

2. SHG Federation:

A federation of SHGs is formed by 15-20 SHGs located in a compact geographic area. Its function is to strengthen and provide support to individual SHGs through regular interactions. Federations support SHGs to gain a greater voice in the local area, help them learn from each other and monitor their performance. Federations are useful for lobbying for local infrastructure and in providing services through the CMRC (see below). Federations also have the organising capacity to manage animal health camps in compact areas.



3. Community Managed Resource Centres:

A Community Managed Resource Centre (CMRC) is formed by 100-200 SHGs (roughly 5-8 federations) living in a compact geographical area to provide for a range of services for betterment of SHGs and the wider community. The CMRC usually has information on the demand for veterinary service in the local area. It also organises services like life and livestock insurance and has good rapport with the veterinary department. Close contact with CMRCs will help Paravets greatly in discharging their services.

4. Milk Cooperative Society:

Primary Milk Cooperatives are the organisations formed by the milk producers at a certain area for a common cause of marketing their milk. The earnings/income of the society will be shared by their members itself. The Cooperatives are closely connected to the district Milk Union, which also provides the cold chain for semen for artificial insemination services. The Paravets need to work closely with the members of the Primary Milk Cooperatives and the Milk Union to obtain supplies and find clients for their work.

5. Watershed association:

A small groups of farmers from a very small catchment organise together to manage watershed management programmes. They conduct meetings and training, ensure participation in decision making of all the farmers in the group. These small groups of farmers are responsible for planning, budgeting implementation, monitoring and management of watershed management activities. Watershed Associations are good to reach out for extension and other services of the Paravets.

6. Forest committee, Parent teachers association, etc.

While all the other committees are useful to keep in touch with, their agenda may not directly support livestock development. But since many of the members of these committees are also members of other CBOs, meeting these CBOs will strengthen the rapport between community members and the Paravets.

- methods**
- Brainstorming
 - Video
 - Presentation

process Brainstorm the participants on the types of community based organisations that they can work with.

Key Question: 'Which community based organisations in your community is important for your work?'

Indicative answers:

- Self-help groups
- Farmers' Clubs

Describe each CBOs and its role in livestock development.

Play any appropriate video that describes the roles of CBOs in livestock development.

Open up for discussions and clarifications.

stop and check! The participants should be able to describe various community based groups that support livestock development and how they are involved.

Sum up the module and seek feedback.



Technical linkages



module aim The Paravet needs to work closely with different actors to ensure that quality veterinary care reaches livestock holders – especially those who are poor. Some of the key actors are the state animal husbandry departments, the district milk cooperative unions, veterinary colleges/universities and research stations, entrepreneurship development. The purpose of this module is to enable participants to understand the importance of each of these institutions and develop their ability to link with them.

learning objectives At the end of this training module participants will be able to:

- The state animal husbandry department and its functions
- The district co operative milk producers union (like Amul, Aavin, Nandini)
- The Veterinary University/Research Centre
- Self-employment or entrepreneurship training institute

module summary

Session Title	Duration
1. Animal Husbandry Department	45 m
2. Cooperative Milk Union	45 m
3. Veterinary University	45 m
4. Entrepreneurship training	45 m
Total	3 hours

materials Charts and markers, brochures/profiles of organisations

methods Lectures, presentations, brainstorming, discussions

guest lecture Invite speakers from the government, milk cooperative union, training institute and a private sector firm

note to the trainer



The four sessions above are designed to use the services of institutions relevant to Erode District in Tamilnadu, their contents are therefore context specific and provided in the manual for illustration purposes only. Modify this module to suit your work area. Also, the module consists of guest lectures in every session. Discuss with your guest faculty in advance so that they are available for your module and the sessions are held effectively. Provide them with a checklist for their sessions. Keep any materials and equipments they would need ready.



15-1 Department of animal husbandry

materials ▪ Charts and markers

content The AH Department in Tamilnadu, which had its origin in 1982 as Civil veterinary department to provide veterinary aid to needy farmers was subsequently renamed as Animal husbandry department in 1948, with the main objectives of treatment and prevention of livestock diseases. Since then, this department has widened its activities.



45 mins

At present the Animal Husbandry Department is under the overall control of the Commissioner and Director of Veterinary Services and Director of Animal Husbandry with allocation of different subjects. The State is divided into 25 regions each headed by a Regional Joint Director of Animal Husbandry and 65 administrative divisions each headed by an Assistant Director of Animal Husbandry. Field veterinary institutions consist of polyclinics, clinician centres, veterinary hospitals that are under the direct control of the Regional Joint Director and veterinary dispensaries, which are under the control of the Assistant Directors.

One Director in the cadre of Additional Director is in charge of the Institute of Veterinary Preventive Medicine (IVPM) located at Ranipet, which is engaged in the production of various kinds of livestock and poultry vaccines and other biological. One central Referral laboratory for disease diagnosis, confirmation and monitoring is functioning at Chennai. The Central Referral Laboratory also coordinates the work of the Animal Disease Intelligence Units headed by Assistant Directors functioning in various parts of the State engaged in disease surveillance and monitoring.

The Department also manages 8 Livestock Farms, 3 Sheep Farms, 20 Cattle Breeding and Fodder Development units and 2 poultry Disease diagnostic Laboratories.

Source: Policy note 2005-06 Animal husbandry department, Tamilnadu

methods ▪ Guest lecture
▪ Discussions

process Introduce the speaker.
The speaker can choose his/her methodology for the session. Typically a 20 minute presentation with a 15 minute discussion and question and answer session would be sufficient.
Steer the participants discussion especially around how they can link up with the Department in the long term.
Close the session by thanking the Guest.

stop and check! Participants are able to correctly describe the objectives and functions of the state animal husbandry department.



15-2 Cooperative milk union

materials ▪ Charts and markers

content The Dairy development department was established in 1958 in Tamilnadu. The activities of the Department include milk procurement, processing, chilling, packing and sale of milk to the consumers, etc.

Objectives of the dairy development department:

1. To assure a remunerative price for the milk produced by the member of the Milk Producers' Cooperative Societies through a stable, steady and well organised market support.
2. Distribution of quality milk and milk products to the consumers at reasonable price.

Functions of district cooperative milk producers union:

There are 17 District Cooperative Milk Producers Unions in Tamilnadu. Their functions include:

1. Establishment of chilling centres.
2. Formation of new milk routes to collect milk produced by the members of the societies
3. Collection of milk from societies, process and pack in modern dairy plants by maintaining quality standards
4. Supply of quality milk to Chennai Metro under hygienic conditions.
5. Fixing of procurement and selling price of milk.
6. Increasing of liquid milk sales by introducing innovative sales promotional activities
7. Supply of inputs to the members of the societies.
8. Rendering veterinary health service and emergency services, to the cattle of members of primaries, to impart training on first aid and on Artificial Insemination to the staff of member societies
9. Extending Artificial Insemination services to the cattle owned by the members of Milk Co operative Societies.
10. Providing milk cans, milk 'O' testers and LN₂ containers.
11. Salem, Erode, Madurai, and Dharmapuri Unions are the feeder Balancing Dairies. Surplus milk in the District unions, after meeting their local sales is diverted to the nearest feeder balancing dairies for conversion into milk products, such as Skim milk powder, Butter, and Ghee.
12. The three cattle feed plants at Madhavaram, Erode and Kappalur are run by the Kancheepuram – Tiruvallur union, Erode union, and Madurai union respectively. The production capacity of these cattle feed plants is 100 MT per day each. The balanced cattle feed produced in the form of pellets and mash are supplied to the members of the milk cooperatives, livestock farms manned by the Animal Husbandry Department and to various local bodies including the Corporation of Chennai.

Source: <http://www.aavinmilk.com/organization.html>.

methods ▪ Guest lecture
▪ Discussions



45 mins



process

Introduce the speaker.

The speaker can choose his/her methodology for the session. Typically a 20 minute presentation with a 15 minute discussion and question and answer session would be sufficient.

Steer the participants' discussion especially around how they can link up with the Milk Union in the long term.

Close the session by thanking the Guest.

15-3 Veterinary university

materials

- Charts and markers

content

Objectives of the Veterinary University Training and Research Centre - VUTRC, Erode:

To harness the potential of livestock in the state. To train the farming community on and off campus to adopt latest technology on animal husbandry practices.

VUTRC, Erode acts as an interface of Tamil Nadu Veterinary and Animal Sciences University (TANUVAS) in the dissemination of knowledge to field veterinarians, entrepreneurs and livestock farmers through various extension programmes like on campus training and off campus training (Mass contact programme, Kalnadai Pathu Kappu Thittam, Farmers' Training camp, NDDB- Artificial insemination workers training programme)



45 mins

The VUTRC also acts as a referral centre of TANUVAS for diagnosing diseases and to solve the managerial, medical and surgical problems in livestock in Erode District. During disease outbreaks immediate and thorough diagnosis of diseases is carried out with ADIU, Erode.

Livestock farmers, self help groups and rural youth are motivated to start small scale dairy, sheep, and backyard poultry farming and they are trained to prepare value added products like rose milk, khoa, paneer, etc.

Broadcasting the vaccination schedule for prevention of monsoon diseases through All India Radio announcements.

Source: Veterinary University Training and Research Centre (VUTRC), Erode

methods

- Guest lecture
- Discussions

process

Introduce the speaker.

The speaker can choose his/her methodology for the session. Typically a 20 minute presentation with a 15 minute discussion and question and answer session would be sufficient.

Steer the participants' discussion especially around how they can link up with the University's activities in the long term.

Close the session by thanking the Guest

15-4 Entrepreneurship training

materials ▪ Charts and markers

content Dr. Ambedkar self employment training institute generally known as ASETI, is sponsored by Canara bank and is located near Coimbatore, at Pudupudur.

Training:

All the training programmes are taught by trained experts/technicians/mentors with emphasis on learning by experience using methodologies like expert lectures, games and exercise, group discussions, role play, interactions with successful entrepreneurs and learning by doing. These are the features of the programme:

- Free boarding and lodging facilities are provided during the training.
- The training is also free of cost.
- Post training business counselling and support for 2-3 years.
- Guidance on credit linkages and other support systems.

The institute is monitored by a Trust with rich experience of running and supporting 26 similar institutes all over the country for the past 15 years. Local Management committee guides the institute to meet its objectives.

Follow up and counselling:

The unique feature of ASETI is systematic post training follow-up support given to ex-trainees for 2-3 years, regular letter correspondence and meetings to facilitate for counselling to the trained youth.

Rural development activities:

- Organising awareness camps for rural development for self employment, poverty alleviation, health, education, youth development, social forestry etc. for sustainable development in project area.
- Organising training programs for Self Help Groups in capacity building, leadership, accounts maintenance, business selection guidance, and management skills in starting and running micro enterprises. Involving in government sponsored programmes in poverty alleviation.
- Organizing rural youth towards social development

Source: Ambedkar Self Employment Training Institute (ASETI), Coimbatore.

methods ▪ Guest lecture
▪ Discussions

process Introduce the speaker.

The speaker can choose his/her methodology for the session. Typically a 20 minute presentation with a 15 minute discussion and question and answer session would be sufficient.

Steer the participants' discussion especially around how they can link up with the ASETI in the long term.

Close the session by thanking the Guest.

Sum up the module by seeking overall feedback on the sessions.



45 mins





Animal health camps



module aim Paravets are expected to take a very active role in organising and managing animal health camps. NGOs and government agencies need grassroots presence to manage camps and the Paravets fit into that role very effectively. The purpose of this module is to generate the awareness among the participants about the purpose, place and methods of organising animal health camps. The module will enable participants to understand the role of organisers and the preparatory work for animal health camps and therefore enhance their skills to engage in these camps. Part of the learning for this module comes from hands on experience gained during actual animal health camps held during the training.

learning objectives At the end of this training module participants will be able to:

- Explain the features of different types of animal health camps
- Explain how to organise an animal health camp
- Spell out the checklist for organising animal health camps

module summary

Session Title	Duration
1. Animal health camps	1 h
2. Organising animal health camps	2 h
Total	3 hours

materials Charts and markers, presentation slides, photos

handouts Checklist to prepare for a camp

methods Brainstorming, discussion, lecture, presentation

note to the trainer



This module should be complemented with practical exposure during animal health camps. In case the participants have already taken part in camps use the module to recap their experiences. During camps, ensure that lessons learnt during the module are refreshed.

At the MKVK, each batch of Paravet trainees takes part in 10-15 animal health camps – mostly organised by the AH Department. The module is therefore very important to help them plan and participate in camps. Camps are also opportunities for the participants to practice their skills in first aid and drug and vaccine administration.



16-1 Animal health camps

materials • Charts and markers

content **What is an animal health camp?**

Due to the dispersed nature of livestock holders, it may be difficult to reach them quickly and in a cost effective manner if approached individually. Animal health camps gather large number of livestock holders and their animals at one place in a short duration of time and thereby ensures cost effective and timely provision of services. Animal health camps are conducted for various purposes; they may be referred to as general camps, vaccination camp, infertility camps, and castration camps.



1 hour

- General Camps: they are held to create general awareness on health and management of livestock and provide a wide range of services like vaccination, AI, pregnancy diagnosis and treatment for parasitic infestations, wounds, etc. Some cases are referred for further treatment in hospitals.
- Vaccination camp: Saturation coverage of animals is necessary for immunisation to be effective. Vaccination camps are held seasonally so that all vulnerable animal populations are covered by appropriate vaccination. The camps also serve to increase livestock holders' awareness of typical seasonal diseases, ways to identify and treat diseased animals and preventive measures.
- Infertility Camps: livestock are valued for their productive capacity and owners lose both time and money when animals become infertile. Special camps to diagnose and treat infertility are therefore an effective means to support livestock holders. Mostly cattle are brought into these camps.
- Castration camp: young males among cattle are usually castrated by the 10th month to maintain breeding among cattle. Castration camps can help all holders to bring young males in their cattle herds to a common location so that castration can be conducted.



- methods** • Lecture
• Presentation
• Discussions

process Explain the definition of animal health camps. Describe the different types of camps.
Discuss the need for animal health camps.
Key question: 'Why do we need animal health camps?'
Explain the need for and purposes of animal health camps.

stop and check! Participants should be able to explain the need for animal health camps. They should be able to list and explain the purposes of different types of animal health camps.

16-2 Organising animal health camps

- materials**
- Charts and markers
 - Presentation slides with pictures of animal camps and equipment
 - **Handout:** Animal health camp checklist

content Planning for an animal health camp

To plan for an animal health camp the following factors should be considered.

- **Objective of the camp:** Reiterating the objectives of the camp ensures that the organisers can ensure that their preparations are in line with the goals. E.g. general camp, vaccination camp, etc.
- **Venue:** Is the venue suitable, can it accommodate the expected number of animals and their owners; is there appropriate place for the organisers and the medical team? Can the required equipment be used on that spot?
- **Time:** Is there adequate time to treat the expected number of animals, has the time been communicated correctly? Do all the members of the camp team know the timings and when should they be present at the venue?
- **Expected number:** What is the expected number of animals?



2 hours

Once the animal health camp is decided upon, a series of preparatory activities must be taken up to ensure smooth conduct of the event. The following checklist will be useful.

- **Objective of the Camp**
- **Venue**
- **Time and duration**
- **Expected number of animals**
- **Veterinarian team members:** (names and contact numbers)
- **Support team members:** local volunteers, SHG/CBO members, NSS volunteers, trainee Paravets, practicing Paravets, drivers, NGO staff, etc.
- **Medicines and Equipment:** Is the list of medications and supplies available? Have sufficient quantities been ordered to keep with expected number of animals? Has the stock arrived? Has it been stored properly? Are the medicines within the expiry date? Has any arrangement been made to stock and distribute these items to various teams during the camp?
- **Sharing responsibilities:** What kinds of teams are required? What is each person/team's role? Have the teams been assigned and oriented about their roles? When should they meet and arrive at the venue? E.g., some people are needed to inform livestock holders about the camp, other teams prepare the venue, some prepare the medicine stocks, etc.
- **Develop formats for recording camp details:** What paperwork needs to be prepared? Are the formats ready? Are enough copies of the format ready? Who is responsible for recording and documentation? Who will consolidate it?
- **General:** vehicles for transporting veterinarians, volunteers and equipment.
- **Precautions to be taken:** in case the camp is during a disease outbreak all necessary precautionary measures recommended for such diseases must be taken. In general all participants must follow basic procedures like use of gloves, washing hands with soap/sanitiser, isolating animals carrying contagious diseases.



Relevant equipment	Quantity required
Feeding cup Syringe, needle Bucket Gloves AI container and AI gun Castrator Gumboots Surgical instruments Sterilising equipment and supplies	
Other items Hot water Soaps Towels	

- methods**
- Brainstorming
 - Subgroup discussion
 - Presentation

process Brainstorm the participants on the preparation required for animal health camps.

Key Question: 'How do we plan for an animal health camp?'

Indicative answers:

'We must determine the purpose of the camp first'

'Must determine the number of animals that must be covered'

'Determine the best location'

'Find out who needs to be involved to provide consultancy and medicines'

Present the factors that must be considered for planning an animal health camp – using slides with photos that illustrate some of these factors.

Divide the participants into subgroups to brainstorm with and develop a checklist for the camps.

Key Question: What items should our checklist for animal health camps have?

Ask each group to present the checklist, consolidate the items on charts.

Sum up using presentation slides (from the content) with relevant photos of camps.

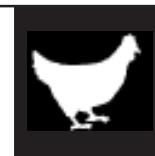
Discuss the final checklist with the participants.

stop and check! The participants should be able to develop a comprehensive checklist for organising animal health camps.

Sum up the module – recap the purposes and types of camps, preparation and checklists required.



Preparing for the future



module aim Paravets, like all professionals need a sense of purpose in their vocation. When individuals have a strong feel of their personal strengths, their values, what motivates them and their long-term goal, they are more likely to attain these goals. Paravets work with people, especially poor men and women in remote locations and they work with animals – their ethics and priorities are bound to be tested in this process. The purpose of this module is to take each participant through a personal journey – to their past and the future and enable them to articulate their personal goals and visions. It is hoped that in the long run the Paravets will gain the respect and admiration of people they work for and inspire more people to follow this vocation. The Module is conducted as a workshop using the Appreciative Inquiry approach.

learning objectives At the end of this workshop the participants will be able to:

- Recap the peak moments of their lives and draw their personal strengths and support
- Visualise aspects of their future – in personal, professional and community spheres
- Develop concrete milestones to help achieve their personal visions

module summary

Session Title	Duration
1. Good things from the past	3 h
2. Dreams for the future	1 h
3. Preparing for the future	1 h
Total	3 hours

materials Charts and markers, presentation slides, blank paper or handouts 1, 2 and 3, crayons or sketch pens

methods Brainstorming, personal reflection, personal presentations, writing

resources Ashford G and Patkar S (2002) The Positive Path: Using Appreciative Inquiry in Rural Indian Communities. IISD download at http://www.iisd.org/pdf/2001/ai_the_positive_path.pdf

note to the trainer



Prepare for the module using materials given in the resources



17-1 Good things from the past

- materials**
- Handout 1: Coat of Arms
 - Presentation slides

content Every human being has stories of challenges and successes in the past. It is easier to look forward to the future if we take aspects that are best and positive about the past. Small successes can motivate us and create confidence to try bigger challenges. While we easily learn from failures, it is also important to learn from past successes.

- methods**
- Brainstorming
 - Personal reflection
 - Writing
 - Storytelling

This is not a content oriented but a process driven session. The session duration will therefore depend on the total number of participants.

process Introduce the objectives of the workshop and create an environment for quiet reflection and sharing among participants.

Provide Handout 1 to each participant and each one to fill in the details – in a quiet spot in the venue within 20 minutes.

When they return ask each participant to pair up with one other participant.

Ask each participant to tell a story of a personal success to the partner taking 10 minutes each
Topic: 'The story of the time in my life when I faced up to a serious challenge and then overcame it and came out successful'



2 hours

After the story telling; ask each participant to share his/her partner's story in the plenary and ask what were the personal strengths of the storyteller and what was the help that came from outside

Seek feedback on how they felt narrating their story

Ask participants to complete Handout 1 with new information that came from the storytelling.

Sum up the session by stressing on the need to find personal strengths from past successes.

stop and check! The participants are able to narrate the story of the peak moment of their life and identify their key personal strengths, values and what support they gain from others.

17-2 Dreams for the future

- materials**
- Charts and markers
 - Handout 2
 - Sketch pens and crayons

content A dream or vision is a picture of a person's future as he or she would like to be. A vision is based on one's own strengths, the support that one can expect from family, friends and others in the world – but even more by a strong sense of what the person would like to see happen in the world because of his or her own efforts. Visions for the future include aspects of personal issues – family, friends, hobbies, values, wealth; professional concerns – work, enterprise, business, skills, growth; and community issues – recognition, contribution, social work, etc.

- methods**
- Personal reflection
 - Writing

process Distribute Handout 2

Ask all participants to mentally recap the strengths they discovered in the previous session. Using these strengths – ask participants to meditate for a while.

Start by asking participants to close their eyes, concentrate on their breathing, relax and then imagine...



1 hour

Topic: 'Imagine, 5 years from now. What will you be doing? What do you look like? What does your work look like? Who is around you? What are the tools of your trade? What does your family look like? What do people say about you? What has been your greatest achievement so far?'

After about 20 minutes – slowly ask all participants to open their eyes and quietly fill out Handout 2. They could use words or pictures to describe their visions.

Sum up the session with feedback from participants and matter from the content

stop and check! Participants have articulated their personal visions in terms of personal, professional and community aspects of their lives.





17-3 Dreams for the future

- materials**
- Presentation slides
 - Handout 3

content Dreams will remain dreams unless we actively plan to achieve them in practical terms. Plans for the future include what we would like to learn, what habits we would like to keep or change, who we shall ask for help and support, what resources we would need and the deadlines for certain actions.

- methods**
- Personal reflection
 - Writing

process Recap what was achieved in session 2. Explain the need for action plans to achieve our visions.

Distribute Handout 3: A letter to myself

Ask participants to relax and meditate and answer the following questions:

Key question:



1 hour

‘If I had a magic wand, what three things about me would I like to change for the better?’

‘In order to achieve my dreams – what would I do in the next six weeks?’

‘What should I have done in the next six months to be on course to my future?’

‘What should be achieved by one year to achieve my goals?’

For each aspect use the six-helpers to find clearer answers – what, why, when, who, where and how.

Once the participants have written their ideas on Handout 3 – seek feedback on the entire process.

Sum up the entire module.

End the workshop with a motivational group song.

stop and check! Participants have developed practical plans for achieving their visions and express that they feel ownership over the results of the exercise.

.....

Handout 1: Coat of Arms

My Strengths

My Values

A Picture that best describes me

What my family values in me

My Personal Vision

Coat of Arms



Handout 2: Personal Vision

My personal vision

In my personal life...

As a professional....

As a member of my community....

Handout 3: A letter to myself

Three weeks after the workshop on personal visioning.... I had done these things

Six months after I wrote my personal vision – these results had taken place – they were taking me closer to my dream.

One year after I saw a dream for myself – I had taken these steps...

These are my friends for the journey:

These are the resources I need to get to my dream:

I am a strong person, yet, if I could change a few things for the better in my life – I would like to be...

Signed by the participant

Date:



Resources

Textbooks and main sources:

Bannerjee, GC (1998) **A Textbook of Animal Husbandry**. 8th Ed. Raju Primlani for Oxford and IBH. New Delhi

E Owen, et. Al (ed.) (2005). **Livestock and Wealth Creation. Improving the husbandry of animals kept by resource-poor people in developing countries**. Nottingham. NUP - As the name suggests, this is a text book that looks at issues relevant to poor livestock holders and goes beyond mere technical issues to look at social, cultural, economic and gender issues in livestock development. The book is current and has several case studies references.

ICAR (1990). **Handbook of Animal Husbandry**. ICAR, New Delhi

IFWA and IIRR (1996) **Environmentally Sound Technologies for Women in Agriculture**. International Federation of Women in Agriculture and IIRR, Silang, Cavite, Philippines.

ITDG and IIRR (1996). **Ethnoveterinary Medicine in Kenya: A field manual of traditional animal health care practices**. Intermediate Technology Development Group and International Institute of Rural Reconstruction, Nairobi, Kenya.

KVK Namakkal (2006). **Recent Developments in Sheep and Goat Production**. VC&RI, Namakkal.

Muthiahmanoharan, P and Arunachalam R (2003) **Agricultural Extension**. Himalaya Publishing House, New Delhi.

MVC (1997) **Livestock Production and Management**. 1st Ed. MVC. TANUVAS. Chennai.

PAD and GAA (undated). **Uyirabimaanam Kol** (Humane Veterinary Care). PAD. Vembar and Chennai.

Paravet Project: <http://www.spc.int/rahs/Projects/paravet1E.htm> Paravet Programme - has a good module designs for Paravet training programmes – though somewhat relevant to the Asia-Pacific region. Basic manuals are downloadable.

Pothi, P (?) **Disease in Livestock and its Prevention**. New Century Book House. Chennai

Raneesh, S, et. al. (ed.) (2005) **A User's Guide on Ethnoveterinary Health Practices**. FRLHT, Bangalore.

Roberts, Stephen J (1971). **Veterinary Obstetrics and Genital Diseases**. CBS, New Delhi.

SEVA (2004) **Indigenous Veterinary Medicine – a Reference Book**. Madurai.

Virtual University for Agriculture Trade – Dept. of Agriculture, Govt. of Kerala has information relevant to India http://www.vuatkerala.org/static/eng/advisory/animal_husb/introduction1.htm



Wikipedia – the free encyclopedia - www.wikipedia.org. The Wikipedia has detailed descriptions about several aspects of veterinary sciences – however, users must judge the content on the web carefully before using it – read Wikipedia comments on the quality of any article before using it.

Online resources:

We have divided resources based on issues best addressed by the sites.

To understand the broader issues related to livestock rearing visit:

INTUTE - Online tutorials on veterinary sciences at Intute. The sites has direct links to several large veterinary science databases: <http://www.vts.intute.ac.uk/he/tutorial/vet>

<http://www.ilri.org/> the **International Livestock Research Institute** website has very accessible learning materials for small livestock holder training.

<http://drostproject.vetmed.ufl.edu/> has excellent pictures for veterinary medicine. The website welcomes further contributions from readers

<http://www.merckvetmanual.com/mvm/index.jsp> - the **Merck Veterinary Manual** is available online.

<http://www.ansi.okstate.edu/breeds/> - **Department of Animal Science – Oklahoma State University** – has detailed and useful information about animal breeds across the world.

<http://www.organicvet.co.uk/> - has a compendium for **organic practices in livestock farming**.

<http://www.ethnovetweb.com/> - This website is about **ethnoveterinary medicine**, or how people around the world keep their animals healthy and productive, and how development can build on this information.

<http://www.iacuc.arizona.edu/training/index.html> - **University of Arizona** learning materials on different animals.

Management of draught animals: a welfare and health perspective in South Africa M. James and R.C. Krecek ATNESA: <http://www.atnesa.org/Empowering99/Empowering99-jamesKrecek-ZA-www.pdf>

<http://lr010.k12.sd.us/animal%20nutrition.ppt> – the presentation slides are useful to understand the basics of **animal nutrition**.

On teaching and training methods:

The documents from the following sites have good examples for developing knowledge and skill learning objectives in Paravet training programmes.

<http://www.okcareertech.org/cimc/ag/ansci-teacher.pdf>

<http://www.okcareertech.org/cimc/ag/ansci-student.pdf>

Neil Bacon et al (1982): **Agricultural Development Workers Training Manual, Volume IV. Livestock.** Nellum (AL) and Associates, Inc., Frogmore SC. For Peace Corps Washington DC, 427p. (this manual is downloadable from the ERIC Site)

[http://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/4h8115/\\$FILE/DairyActivity4.pdf](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/4h8115/$FILE/DairyActivity4.pdf) - has interesting exercises for all aged groups under **the 4-H Dairy Project**.

For games and exercises

McKee, N, M Solas and H Tillmann (Ed.) (1998) **Games and Exercises: A manual for facilitators and trainers involved in participatory group events.** Unicef (1998)

International HIV/AIDS Alliance (2003) **100 ways to energise groups: Games to use in workshops, groups and the community.** Brighton – see www.aidsalliance.org

Participatory Training Methodologies:

PRIA (1994) **Training of Trainers – a Manual for Participatory Training Methodology in Development.** New Delhi. PRIA (check at www.pria.org)

VSA, IIRR and PEPE (1998) **Creative Training: A Users' Guide.** Manila. VSO, IIRR, PEPE. **This is a useful manual to learn participatory training methodologies.** Check the IIRR website for information (www.iirr.org)

CEDPA (1995) **Training Trainers for Development.** Washington D. The Centre for Development of Population Activities. <http://www.cedpa.org>

Images and videos:

<http://imagedb.vetmed.wsu.edu/> The images in this data base are for educational, non-commercial use only. Please credit **Washington State University** as the image source and link web pages containing images from this database to <http://imagedb.vetmed.wsu.edu/>

Dr. Rodney Geisert: **University of Missouri (Animal Sciences)** <http://animalsciences.missouri.edu/reprod/> : has a wealth of information on animal reproduction – notes, images, and video

Sites that have very simple and accessible learning materials are meant for children's learning and materials from such sites are adequate for the purposes of Paravet training in some sessions.

http://www.animalcorner.co.uk/farm/cows/cow_anatomy.html

http://www.animalcorner.co.uk/farm/chickens/chicken_anatomy.html

<http://www.iowabeefcenter.org/pdfs/bch/02200.pdf>

www.selectsires.com/reproductive/reproductive_anatomy.pdf

www.wvu.edu/~agexten/forglvst/Dairy/dirm1.pdf

<http://nongae.gsnu.ac.kr/~cspark/teaching/chap3.html>



www.gov.ns.ca/agri/agaware/chickhatch/pg16.pdf

<http://ag.ansc.purdue.edu/nielsen/www245/lecnotes/avianrepro.html>

<http://www.poultry.uga.edu/academics/pslab202.htm> - the **University of Georgia – Department of Poultry Sciences** – has excellent slides on chicken anatomy.

<http://www.ag.auburn.edu/poul/virtualchicken/> - has links to requesting an animated programme on the chicken reproductive system. <http://www2.dpi.qld.gov.au/sheep/8535.html> - for reproductive tract of ewes.

http://vetmedicine.about.com/od/runimantanatomy/Ruminant_Anatomy_Cows_Goats_Sheep_Llamas.htm - has animations and simple reading on anatomy – watch the animation of goat reproductive system.

Images used in the manual:

There are free images available for download at

<http://www.developmentart.com/index.htm> (the animal clipart in the headers of this document were taken from here)

<http://free-clipart.net/>

We have also used copyright free images from IIRR's publications

DFID, OIKOS & IIRR (2000) **Social and Institutional Issues in Watershed Management in India**, July 2000.

IFWA and IIRR (1996) **Environmentally Sound Technologies for Women in Agriculture**. International Federation of Women in Agriculture and IIRR, Silang, Cavite, Philippines.