Training Manual
On
Small Animal Management, Project Planning and Social Mobilization.

Prepared by
The Society for Management of Information, Learning & Extension (SMILE), Bhubaneswar.

In collaboration with
Gopabandhu Academy of Administration, Bhubaneswar.
Acknowledgements

This manual is the product of Animal Husbandry Department Officers and Teaching faculty of Orissa Veterinary College.

Our thanks go to all the personnel who have worked with us throughout the process. Support provided by the Gopabandhu Academy of Administration (GAA), Bhubaneswar to assist SMILE to develop the manual is gratefully acknowledged.

We wish to acknowledge the support given to our work by the Dean and staff of the Orissa Veterinary College, Bhubaneswar.

Dr. B.B.Nanda, Deputy Director, GAA has always encouraged us at every step for improvement.
Reference

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EXECUTIVE SUMMARY

The Society for Management of Information, Learning & Extension (SMILE), Bhubaneswar under the Department of Animal Husbandry & Veterinary Services of the State Government of Orissa in collaboration with Gopabandhu Academy of Administration, Bhubaneswar has undertaken the task for preparing a training manual on Small animal management, Project planning and social mobilization for veterinary doctors.

This manual has been prepared by the Animal Husbandry staff with the support of specific subject matter specialists. It will be useful as a conceptual guide as well as reference material for trainers. Moreover, some part of it could be used as reading material for participants.

The field requirement have been integrated into the training module. Sheep, goat and pig rearing are popular because of the prolificacy, less investment, and minimal skills that are needed for success. In addition, small animal are very adaptable that perform well in almost any environment. However, the present manual focuses on some modern technological aspects for enhancing the productivity.

Although the output of traditional small animal rearing in terms of weight gain and meat yield per animal is low, it is obtained with minimal labour and other inputs. This factor of low input and, consequently, low risk is one of the major advantages of small animal production. Simple changes in management of small animal can significantly improve production and the living conditions of many rural families in terms of enhanced nutrition and income generation through the sale of animal. Improved small animal production is therefore a low-cost and important aspect of rural development.

This manual aims to provide, for Veterinary Doctors, modern practices on the production of small animal and how productivity can be improved by introducing appropriate, low-cost approaches. The manual describes the steps that can be taken to improve health of animals and reduce the mortality. More costly techniques, such as supplementary feeding, intensive rearing are also covered in this manual. These information could be used for planning, implementing and monitoring small animal programme. It is expected that service providers will educate the farmers about the extra costs and labour that would be required for more intensive small animal production.
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<td>AH</td>
<td>Animal Husbandry</td>
</tr>
<tr>
<td>AHD</td>
<td>Animal Husbandry Department</td>
</tr>
<tr>
<td>AI</td>
<td>Artificial Insemination</td>
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<tr>
<td>ATMA</td>
<td>Agriculture Technology Management Agency</td>
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<tr>
<td>AV</td>
<td>Audio - Visual</td>
</tr>
<tr>
<td>BC</td>
<td>Backward Caste</td>
</tr>
<tr>
<td>BW</td>
<td>Body Weight</td>
</tr>
<tr>
<td>CBPR</td>
<td>Capacity Building for Poverty Reduction Programme</td>
</tr>
<tr>
<td>CDVO</td>
<td>Chief District Veterinary Officer</td>
</tr>
<tr>
<td>CPR</td>
<td>Common Property Resources</td>
</tr>
<tr>
<td>DAH</td>
<td>Directorate of Animal Husbandry &amp; Veterinary Services</td>
</tr>
<tr>
<td>DFID</td>
<td>Department For International Development</td>
</tr>
<tr>
<td>DRDA</td>
<td>District Rural Development Agency</td>
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<tr>
<td>FGD</td>
<td>Focus Group Discussion</td>
</tr>
<tr>
<td>FMD</td>
<td>Foot and Mouth Disease</td>
</tr>
<tr>
<td>FSB</td>
<td>Frozen Semen Bank</td>
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<tr>
<td>GAA</td>
<td>Gopabandhu Academy of Administration</td>
</tr>
<tr>
<td>GOI</td>
<td>Government of India</td>
</tr>
<tr>
<td>GP</td>
<td>Gram Panchayat</td>
</tr>
<tr>
<td>HID</td>
<td>Human and Institutional Development</td>
</tr>
<tr>
<td>IEC</td>
<td>Information, Education &amp; Communication</td>
</tr>
<tr>
<td>ITDA</td>
<td>Integrated Tribal Development Agency</td>
</tr>
<tr>
<td>LAC</td>
<td>Livestock Aid Centre</td>
</tr>
<tr>
<td>LI</td>
<td>Livestock Inspector</td>
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<tr>
<td>MIS</td>
<td>Management Information System</td>
</tr>
<tr>
<td>NABARD</td>
<td>National Bank of Agriculture and Rural Development</td>
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<tr>
<td>NGO</td>
<td>Non-Governmental Organisation</td>
</tr>
<tr>
<td>OUAT</td>
<td>OrissaUniversity of Agriculture &amp; Technology</td>
</tr>
<tr>
<td>PPR</td>
<td>Pestis-Petids-Ruminants</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Full Form</td>
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<tr>
<td>PRI</td>
<td>Panchayat Raj Institution</td>
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<tr>
<td>RMC</td>
<td>Regulated Market Committee</td>
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<tr>
<td>SA</td>
<td>Small Animal</td>
</tr>
<tr>
<td>SAD</td>
<td>Small Animal Development</td>
</tr>
<tr>
<td>SC</td>
<td>Scheduled Caste</td>
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<tr>
<td>SDVO</td>
<td>Sub Divisional Veterinary Officer</td>
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<tr>
<td>SGSY</td>
<td>Swarnajayanti Gram Swarojgar Yozana</td>
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<tr>
<td>SHG</td>
<td>Self Help Group</td>
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<tr>
<td>SMILE</td>
<td>Society for Management of Information, Learning &amp; Extension</td>
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<tr>
<td>SMS</td>
<td>Subject Matter Specialist</td>
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<tr>
<td>SWOT</td>
<td>Strengths, Weaknesses, Opportunities and Threat</td>
</tr>
<tr>
<td>TC</td>
<td>Training Centre</td>
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<tr>
<td>TNA</td>
<td>Training Need Assessment</td>
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<tr>
<td>ToT</td>
<td>Training of Trainers</td>
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<tr>
<td>TV</td>
<td>Television</td>
</tr>
<tr>
<td>VAS</td>
<td>Veterinary Assistant Surgeon</td>
</tr>
<tr>
<td>VD</td>
<td>Veterinary Dispensary</td>
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<tr>
<td>VOTI</td>
<td>Veterinary Officers Training Institute</td>
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<tr>
<td>VT</td>
<td>Veterinary Technician</td>
</tr>
<tr>
<td>WORLP</td>
<td>Western Orissa Rural Livelihood Project</td>
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Preface

I am glad to know that SMILE, Bhubaneswar has prepared a Training Manual for Veterinarians working in the state of Odisha on ‘Small Animal Management, Project Planning & Social Mobilization’ in collaboration with Gopalbandhu Academy of Administration, Bhubaneswar.

Small Animals like Sheep, Goat and Pig contribute a great deal for livelihood of rural household of Odisha. These animals contribute about 70% of the total meat produced in the State. Small Animal keepers have been rearing these animals since long, however they have limited access to the modern scientific management practices and disease preventions as a result, the production and productivity is not achieved to the desired level. Therefore, farmers are not able to maximize their profit. This can be overcome by providing simple technical inputs and information on Small Animal Management to the farmers at their doorstep.

The capacity building programme through training of Veterinarians & Para-veterinarians along with exposure visit to the National level Small Animal Development Institute shall assist in providing better service delivery. This kind of capacity building programme will strengthen and refresh the existing knowledge and skill on Small Animal Management of the Veterinarians and Para Veterinarians so as to disseminate their learning to the farmers in an effective manner. This uniformity in transmission of information will help in better management practices by farmers.

A number of Veterinarians and Para-veterinarians shall undergo training in batches at State and District level Training Institute. An attempt has been made to prepare a standard and user-friendly Training Manual so as to ensure uniformity in all the aspects of Training programmes of Small Animal Development.

I hope, this Manual will be of great help in imparting training to the Veterinarians of Odisha so that, they will be well equipped for better service delivery at farmers’ level.

(Satyabrata Sahu)
Commissioner-cum-Secretary
**SMALL ANIMAL MANAGEMENT, PROJECT PLANNING AND SOCIAL MOBILISATION**

**Training Objective** - At the end of the training program the participants will be able to
1. Update knowledge and skill on Sheep, Goat and Pig farming
2. Analyse the possible interventions to improve the small animal development scenario
3. Assess possible losses a farmer incurs due to various management problems and its remedial measures
4. Explore possible ways to motivate the farmers for adopting modern technology
5. Analyse the community mobilization techniques suitable for small animal rearers

**Time Table**

<table>
<thead>
<tr>
<th>Date/Day</th>
<th>10.00 AM – 11.30 AM</th>
<th>11.30 AM – 1 PM</th>
<th>2.00 PM – 3.30 PM</th>
<th>3.30 Pm – 5.00 PM</th>
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<tr>
<td>Day-1</td>
<td>Inauguration</td>
<td>Present status of small animal farming and role of AHD</td>
<td>Community and its diversity</td>
<td>Group approach</td>
</tr>
<tr>
<td></td>
<td>Introduction of the programme Principal</td>
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<tr>
<td>Day-2</td>
<td>Care and management of Pig</td>
<td>Common diseases of Pig and their prevention</td>
<td>Participatory Project Planning</td>
<td>Problem Identification in Sheep, Goat &amp; Pig rearing to enhance income</td>
</tr>
<tr>
<td>Day-3</td>
<td>Action Plan on Pig development</td>
<td>Care and management of Sheep and Goat</td>
<td>Common Diseases of Sheep and Goat and their prevention</td>
<td>Parasitic infestation in Sheep and Goat and their remedies.</td>
</tr>
<tr>
<td>Day-4</td>
<td>Breeding practices, genetic upgradation in sheep, goat and Pig</td>
<td>Feed and feeding management of sheep &amp; goat</td>
<td>Preparation of small scale sheep, goat and Pig project and their economic analysis</td>
<td>Fodder Crops and fodder trees for small animals and visit to fodder farm.</td>
</tr>
<tr>
<td>Day-5</td>
<td>Action plan of Sheep and Goat development.</td>
<td>Development of comprehensive plan (inclusive of Pig, Goat &amp; Sheep) potentiality &amp;intervention</td>
<td>Presentation of final Action plan</td>
<td>Valediction</td>
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### LESSON PLAN-1

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<table>
<thead>
<tr>
<th>Topic</th>
<th>Duration:</th>
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<tr>
<td>Inauguration &amp; Introduction</td>
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<td>Theory / Practical</td>
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### Objectives:

At the end of the lesson the participants will be able to...

- Introduce the aim, content and structure of the training programme
- Introduce the participants to one another
- Create a conducive training environment

### Materials, Tools, Equipment:

(for Practical in the Field, Lab.)

### Teaching Aids:

- AV Aids, Information Sheet, Assignment Sheet, Test etc.
- White Board, Marker, handout, Brown sheet, Permanent marker

### Remarks:

(Notes for changes and adaptations of the lesson plan, for use in future classes)
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<th>Time</th>
<th>Content: Steps/ Key Points</th>
<th>Methods</th>
<th>Aids</th>
</tr>
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<tr>
<td>10 Min</td>
<td><strong>INTRODUCTION</strong></td>
<td></td>
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<td></td>
<td>– Inauguration</td>
<td>Discussion</td>
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<td></td>
<td>Invite a senior government officer to be the chief guest.</td>
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<tr>
<td></td>
<td>Ask the chief guest to say a few words about the importance of the training and how rural poor can benefit out of small animal rearing.</td>
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<td></td>
<td>Welcome the participants.</td>
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<td></td>
<td>Explain the objectives of training programme.</td>
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<tr>
<td>25 Min</td>
<td>**MAIN PART * **</td>
<td>Group discussion</td>
<td>White Board, Marker,</td>
</tr>
<tr>
<td></td>
<td>Invite the participants to a short ice breaker. Ask each participant to choose a partner with whom he/she desires to interact. Ask them to discuss amongst themselves (Partners) for 10 minutes about their name, place of posting and family status. Then ask them to introduce their partner.</td>
<td></td>
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</tr>
<tr>
<td>20 Min</td>
<td>Introduce the main training contents of 5 days module.</td>
<td>Lecture</td>
<td>Flip chart</td>
</tr>
<tr>
<td>15 Min</td>
<td>Ask the participant about their need and expectations from the training programme.</td>
<td></td>
<td>Brown sheet, marker, Adhesive Tape</td>
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<tr>
<td>20 Min</td>
<td>Introduce the training methodology as a participatory, action-oriented, practical way of adult learning.</td>
<td>Group discussion</td>
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<td></td>
<td>People learn best by ‘doing’, not by ‘being told’ or lectured. Class room exercises wherever required, will be used and then the key messages, learning points will be consolidated for application in the future, rather than passively receiving messages.</td>
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<td><strong>CONCLUDING SESSION</strong></td>
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<td>– Summary, Review: Student</td>
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<td></td>
<td>– Test</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>– Home work</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>– Hints for next lesson</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Title of the assignment: Introducing the partner?

Size of the Group: 20

Task: Ask participants to choose one partner
     Explain the points for discussion with partners

     - NAME
     - PLACE OF POSTING
     - FAMILY STATUS

     Each participant will introduce their partner

Different working steps
     Ask each participant to choose a partner with whom he/she desires to interact.
     Ask them to discuss amongst their partner for 10 minutes about their Name, Place of posting and Family status

Presentation of the result:
Material:
     Brown sheet, Marker, Adhesive tape

Time Frame:
     25 mins

For the exercise/Group work: Min. 10
For the presentation: Min. 15

Criteria for the evaluation: There will be free and frank exchange of ideas.
CHECK LIST

• Making people comfortable with one another. Introducing participants through games helps them to open up to each other and to build up rapport between the participants and facilitators during the workshop.

• Creating a good atmosphere for training

• Enabling participants to learn about themselves

• Enabling participants to gain useful information

• About one another e.g. Skills, experience and strengths

• Sharing topics, session schedule, methodology and agreeing on these. Sharing of the objectives and expectations of the participants helps to match their expectations with the workshop topics. This makes it possible at the very start of the workshop to change topics according to the needs of the participants.
<table>
<thead>
<tr>
<th>Subject: Small Animal Management, Project Planning and Social Mobilization</th>
<th>Number of participants: 20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topic: Present status of Small Animal Farming and role of Animal Husbandry Department</td>
<td>Duration: 90 Min</td>
</tr>
<tr>
<td>Lesson: Theory / Practical</td>
<td></td>
</tr>
</tbody>
</table>

**Objectives:**

At the end of the lesson the participants will be able to....

- Analyse the present status of small animals in their district
- Examine critically the possible ways of convergence with other line departments for small animal development

<table>
<thead>
<tr>
<th>Materials, Tools, Equipment: (for Practical in the Field, Lab,)</th>
<th>Teaching Aids: (AV Aids, Information Sheet, Assignment Sheet, Test etc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>White Board, Marker, handout, Brown sheet, Permanent marker</td>
<td></td>
</tr>
</tbody>
</table>

**Remarks:** (Notes for changes and adaptations of the lesson plan, for use in future classes)
<table>
<thead>
<tr>
<th>Time</th>
<th>Content: Steps/ Key Points</th>
<th>Methods</th>
<th>Aids</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 Min</td>
<td><strong>INTRODUCTION</strong></td>
<td>Discussion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>What is the potential of small animal rearing in your district? Explain objectives</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25 Min</td>
<td>**MAIN PART ***</td>
<td>Group discussion</td>
<td>White Board, Marker,</td>
</tr>
<tr>
<td></td>
<td>Lead the discussion on small animal status in various districts and in the state.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Sheep/Goat/Pig Population and density per 100 person</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Output from the small animal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 Min</td>
<td>Discuss about the ongoing department programmes</td>
<td>Lecture</td>
<td>Flip chart</td>
</tr>
<tr>
<td></td>
<td>o Deworming</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Supply of breeding male</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Vaccination</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Watershed/Microprojects/SGSY/OTELP/ATMA/OCTMP etc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 Min</td>
<td>Sensitization of small animal owners</td>
<td>Group discussion</td>
<td></td>
</tr>
</tbody>
</table>

**CONCLUDING SESSION**

- Summary, Review: Student
- Test
- Home work
Subject: Overview

Topic: Present status of Small Animal Farming and role of Animal Husbandry Department

Objective:

At the end of the lesson the students will be able to:

- Analyse the present status of small animal in their district
- Examine critically the possible ways of convergence with other line departments for small animal development

Introduction:

The small animal sector assumes critical importance for the economically vulnerable section of the community and help in times of economic crisis. The pigs are traditionally reared by a particular community in the society. Since the pigs are very prolific breeders with very high feed conversion ratio, it has a good potential to explore. Goat is reared as a means of livelihood throughout Orissa. This is considered as poor man’s cow. Sheep are hardy animals and comparatively less vulnerable to diseases. The income from rearing small animal farming is substantial.

The number of goat per 100 persons in the State level is 16. The density of the goat per 1 square km of geographical area is found to be 38 in the State. Average density of Sheep per 100 person is 4.8 in the State. The density of the sheep per 1 square km of geographical area is found to be 11 in the State. At the State level, density per 1 square km is 1.6 pig per 100 persons. The density of pig per 1 square km of geographical area is found to be 3.7 in the state.

The Department of Animal Husbandry and Veterinary Services, Orissa is the major player involved in Small Animal Sector Development. The basic services like health care and advisory services are provided by the field level veterinary institutions available in the State. The State has six goat farms, 2 sheep farms and one pig farm. The purpose of these small animal farms is to produce breeding males and offer exposure and demonstration of modern practices to the farmers.

Small animal sector consists of goat, sheep and pig. The small animal sector is gaining importance in recent times because income elasticity of the demand is high for the meat and meat products.

The State has 8.9 million small ruminants (goat &sheep) and 0.6 million pigs as per 2007 census.
What does the AHD do?

Livestock plays a significant role in rural society, both in economic as well as in social development. The stakeholders in livestock development are manifold, e.g., men & women farmers, AHD, OMFED, OPOLFED, OUAT, DRDA, NGOs, banks, insurance companies, external aided projects, etc. The AHD has the mandate to provide technical and advisory services in livestock development to farmers aiming at an increase in productivity.

For the implementation of small animal development programmes the department offers different services to the public:

− Health care services – Preventive vaccination, Curative treatment, disease surveillance etc.
− Breeding services – Selective Breeding, Availability of buck/ram
− Feed and fodder services – Fodder tree plantation, Pasture development
− Advisory services – Training of farmers, exposure visit

However, often the services provided by the AHD may not be adequately addressing farmers’ problems related to all the species and the corresponding services. For example, we may come across a situation as illustrated in the following table:

The situation of AH programmes and services delivered in a sample village

<table>
<thead>
<tr>
<th>Programmes</th>
<th>Services</th>
<th>Health care Services</th>
<th>Breeding Services</th>
<th>Feed &amp; Fodder Services</th>
<th>Advisory Services</th>
<th>Marketing services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sheep development programme</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goat development programme</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Piggery development programme</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Very often **** Often *** Sometime ** Rarely * Never ☐

The table given in the exercise could assist participants to examine the AHD service status in their area. The exercise would help the field functionaries to identify which services are given more priorities and which are being given less or no importance in the past.

After group Work, Let us analyse each findings.
Goat development programme

The matrix may indicate that some attempts have been made with regard to animal health and advisory services and no attempt has been made with respective to breeding, feed and fodder and marketing services.

Sheep development programme

The matrix may indicate that some attempts have been made with regard to animal health and advisory services and no attempt has been made with respective to breeding, feed and fodder and marketing services.

Piggery development programme

According to the matrix we may conclude that in that village no sincere attempt has been made to promote any services to improve or contribute in the piggery development programme.

What can be done to improve such a situation?

The services provided by the AHD can be improved through many ways. But the first and foremost way is to enable the livestock owners to demand for better services. This is possible if they have the right information and awareness on AHD programmes.

Co-ordination:

The process of bringing the activities of the different persons/sectors in relation with one another so as to achieve the common goal is called Co-ordination.

Co-ordination consists of inter-relating the various parts of the work. It involves co-ordinating the various job roles and responsibilities of yourself and other staff of your unit & other units in the same organization, and of your unit with the community.

Hence in brief:

**Coordination involves interrelating the various job role and responsibilities:**
- of yourself with other staff of your unit
- of your unit with other units.
- of your organization with other

**Forms of co-ordination**
- Vertical
- Horizontal
Effective Coordination

- Role clarity
- Participative decision making
- Functional multi-disciplinary committee.
- Shared leadership.

Effective communication is vital in all the above aspects

Features of coordination

- It is not an automatic process, it has to be achieved
- Continuous activity
- Group effort
- Common threads it runs through all the following managerial functions:
  Programme planning, implementing, Directing, Monitoring & Evaluation, Controlling etc.

Importance of co-ordination

- Increases efficiency: it pulls all the functions & activities together. Resources are utilized in a proper manner. It ensures the smooth flow of resources into productive channel and brings the desired quality & quantity of output.
- Improves human relations: it brings unity of actions and direction. It helps building of a cohesive team.
- Inter departmental harmony: well co-ordinated activities helps in development of clarity about the tasks. It creates balance between different wings, people and facilities.
Convergence with other Organisations:

Sheep and Goat are kept for a number of reasons including: an easily liquidated resource; for consumption of meat; for manure etc. Local goats have further advantages, they can thrive well, they are cheap to buy and can make a quicker return on invested capital. In addition they adapt to a wide variety of climatic conditions and survive on browse material not normally consumed by other stock.

The problems faced by sheep and goat keepers are mainly, nutritional deficiency and disease. Worm infestation appears to be the most important disease condition in the state.

The present budget allocation under state plan is insufficient to meet the requirement of small animal sector particularly for health care and breeding. Since the small animals are mostly reared by poor people any intervention for improving the small animal sector will directly benefit the poor. Therefore various ongoing programmes working for poverty reduction need to focus on small animal development.

Other issues raised included the acute shortage of fodder and water that adversely affected small animal productivity. While watershed development is a major programme for rainfed areas of the state, the focus has largely been on agriculture development. There is need for convergence between livestock and agriculture development especially in rainfed areas.

Some of the programmes like capacity development of small animal keepers, exposure visit, deworming and development of common property resources could be taken up by the line departments.
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<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Topic:</strong></td>
<td>Community and its diversity</td>
<td><strong>Duration:</strong></td>
<td>90 Min</td>
</tr>
<tr>
<td><strong>Lesson:</strong></td>
<td>Theory / Practical</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Objectives:**
At the end of the lesson the participants will be able to....

- Analyse the composition of community
- Verify whether the community is homogenous or heterogeneous
- State the necessity of understanding each community before introducing any intervention
- Describe the involvement of women in small animal management
- Examine the present trend of livestock development

**Materials, Tools, Equipment:**
(for Practical in the Field, Lab.)

**Teaching Aids:**
(AV Aids, Information Sheet, Assignment Sheet, Test etc.)

White Board, Marker, , handout, Brown sheet, Permanent marker

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<th>Content: Steps/ Key Points</th>
<th>Methods</th>
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</tr>
</thead>
<tbody>
<tr>
<td>10 Min</td>
<td><strong>INTRODUCTION</strong></td>
<td>Discussion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>As rural development professional/ extensionist whom do we focus at while delivering messages/ transfer of technology</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Explain objectives</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 30 Min   | **MAIN PART *  
- The term community (common identity, geographical boundary, mutual support, sharing & sharing)  
- Composition of community (age, caste, sex, literacy etc.)  
- Current trends in livestock development**                                                                                                                | Discussion| White Board, Marker,     |
| 25 Min   | Need for consulting people while making situation analysis                                                                                                                                                    | Lecture   |                           |
| 15 Min   | Role of Women in small animal development                                                                                                                                                            | Discussion|                           |
| 10 Min   | **CONCLUDING SESSION**  
- Summary, Review: Student  
- Test  
- Home work                                                                                                                                           |           |                           |
Subject: Small Animal Management, Project Planning and Social Mobilization

Topic: Community and its diversity

Objective:

At the end of the lesson the students will be able to:

• Analyse the composition of community
• Verify whether the community is homogenous or heterogeneous
• State the necessity of understanding each community before introducing any intervention
• Describe the involvement of women in small animal management
• Examine the present trend of livestock development

As there are many people living in a community, we should know who these people are and what their needs are with regard to livestock development. We also need to decide whether we should focus our attention on people who are well off in a community or whether we should enlarge our focus so that more and more people (who really need our support) can be benefited.

Hence, every individual who is representing the department at community level should be very clear about the composition of the community and the programmes and services meant for them.

The word ‘community’ is being widely used but very difficult to understand it. Usually we come across three types of meaning when we use the term ‘community’.

• The term community refers to geographical boundaries – from a village to a larger national or international entity, e.g. the Indian community.
• Community as an expression of common identity, which may cut across geographical boundaries, e.g. the tribal community.
• Community is also seen as the basis for mutual caring, sharing and support.

When we say a ‘village community’, it can be said that a community is a group of people who adopted a system of life in a particular area, the village area. The problem with understanding a community could be due to the fact that the word community conveys a sense of completeness and possible equality. But, in reality, there are lots of differences, conflicts and power divisions in a
community. Therefore, for our understanding we can define community as a “group of people living together in certain area, with both elements of shared interests and harmony and elements of conflict”.
Since the focus of AHD is on communities depending on livestock, either directly or indirectly, it is essential for each of us to understand the composition of community.

“Again and again, outsider professionals treat communities as homogenous. Policy documents and project proposals advocate ‘community participation’ and go on further. Visitors to villages and slums assume that those whom they meet represent ‘the community’.”

**Different groups within a Community**

When we analyse ‘a community’ closely, we come across different social factors that differentiate people within the community. These social factors could be age, sex, education, caste, religion, resources, political power, etc. when we look at each of these factors in a community, we would find many difference:

<table>
<thead>
<tr>
<th>Age</th>
<th>Young and old</th>
<th>So, what does the word “community” indicate?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>Male and female</td>
<td>A homogenous group of People</td>
</tr>
<tr>
<td>Education</td>
<td>Literate and illiterate</td>
<td>Or different groups of People?</td>
</tr>
<tr>
<td>Caste</td>
<td>Upper caste and lower caste</td>
<td></td>
</tr>
<tr>
<td>Religion</td>
<td>Majority and minority</td>
<td></td>
</tr>
<tr>
<td>Resources</td>
<td>Resources rich and resource poor</td>
<td></td>
</tr>
<tr>
<td>Political</td>
<td>Powerful and without power</td>
<td></td>
</tr>
</tbody>
</table>

This shows that the community also includes those who are physically weak, children, the old, women backward castes, disabled and those who are poor.

**Livestock Keepers**

As a functionary of the AHD, your major focus is to work with livestock farming families in your LAC area on improvement of livestock productivity.

These farming families are not all the same. Therefore, you will need to categories families into: resource-poor and resource-rich families, families specialized in production of one particular species such as dairy or small ruminants, livestock oriented and agriculture oriented families, etc. the resources and the cultural practices of different categories of farming families need to be taken into account if you want to be successful in your extension efforts. An important categorization of farmers is on the basis of gender, i.e., men and women farmers.

**Women in small animal development**

Throughout the world, both men and women in farming families are engaged in a number of livestock production activities. It is well known to you that livestock rearing in general and small animal management in particular in Orissa, is primarily a family based activity with both men and women being
involved. Yet, men’s contribution is mostly the focus of attention, while women’s contribution remains undervalued and is given little attention. This is no exception in the activities of our Department.

Small and landless farmers, taken together, are the largest small animal holders. In the majority of the small and landless farm families, the women perform most of the activities related to small animal management. The extent of such involvement of women varies from community to community, state to state, or between the economic categories. However, the general picture suggests that women perform almost all the tasks related to small animal in the private domain, while men perform mostly outdoor tasks. Thus, right from animal shed cleaning, feeding, watering, women bear the major brunt, whereas tasks like taking the animals to the veterinary hospital, etc., are performed mostly by men. Therefore, understanding of different roles played by men and women within a farming family is crucial for designing extension Programme.

**Current Trends In Livestock Development**

Before we conclude this chapter, a note on the current trends in development to give some ideas about the current thinking and trends in the development scenario in general and of the livestock sector in policy (Draft), which underlines the serious thought extension, needs to be given as part of the AHD mandate.

The following illustrates the current trends in extension with the help of different dimensions of the AHD Programme.

<table>
<thead>
<tr>
<th>Dimension</th>
<th>From</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programme coverage</td>
<td>Only one livestock species</td>
<td>All livestock species</td>
</tr>
<tr>
<td>Clients</td>
<td>Target group</td>
<td>All livestock holders/caretakers</td>
</tr>
<tr>
<td>Influence</td>
<td>Enforcement</td>
<td>Problem solving</td>
</tr>
<tr>
<td>Objectives</td>
<td>Technology transfer</td>
<td>Development of local institution/organization</td>
</tr>
<tr>
<td>Scale</td>
<td>Individuals</td>
<td>Group, community</td>
</tr>
<tr>
<td>Scope</td>
<td>Input supply only</td>
<td>Information/advice only</td>
</tr>
<tr>
<td>Payment</td>
<td>Free service</td>
<td>Clients pay</td>
</tr>
<tr>
<td>Direction</td>
<td>Top-down</td>
<td>Two-way</td>
</tr>
</tbody>
</table>
In other words, there is a trend towards:

- Coverage of all livestock species: large ruminants, small ruminants, pigs, poultry etc. under the AH Programme;
- Considering all livestock holders and caretakers as clients of AHD;
- Adopting a problem solving approach to livestock development instead of imposing AHD programmes on farmers;
- Striving at a balance between technology transfer and organizing farmers (e.g. co-operatives);
- Emphasis on approaching a group of farmers rather than individual farmer;
- Focusing more and more on information and advice rather than input supply;
- Payment by farmers for the services offered by the AHD, and
- Two way flow of information, e.g. from extension workers to staff and from farmers to extension workers.

SITUATION ANALYSIS AND PROBLEM IDENTIFICATION

Importance

There is wide divergence in conditions under which small animals are reared. Such divergence is noticeable both in terms of areas in which livestock are reared and people who rear them. For example, in forest areas, mostly goat rearing is advantageous. Hence, if you are conducting training on small animal development, take care of reaching the women members from the small and marginal farmers’ households.

Need for consulting people:

For effective extension work, you need to carry out activities around actual situation and problems of your area as well as people. You can collect information about the actual situation, only when you consult the concerned people. Generally, such consultation is ignored while undertaking small animal development. In such cases you stand the risk of not taking up the actual problem areas while working among the people.
Visual representation to understand the local farmer families 'CONCEPTS'.

Fig -1
# LESSON PLAN-4

<table>
<thead>
<tr>
<th>Subject:</th>
<th>Small Animal Management, Project Planning and Social Mobilization</th>
<th>Number of participants:</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topic:</td>
<td>Group Approach</td>
<td>Duration:</td>
<td>90 Min</td>
</tr>
<tr>
<td>Lesson:</td>
<td>Theory / Practical</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Objectives:
At the end of the lesson the participants will be able to....

- Define a group
- Explain the conducive criteria suitable for formation of a group
- Describe different stages of Group development.
- Describe different criteria for SHG gradation

## Materials, Tools, Equipment:
(for Practical in the Field, Lab,)

## Teaching Aids:
(AV Aids, Information Sheet, Assignment Sheet, Test etc.)

White Board, Marker, , handout, Brown sheet, Permanent marker

## Remarks:
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<th>Methods</th>
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</tr>
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<tbody>
<tr>
<td>10 Min</td>
<td><strong>INTRODUCTION</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>United we stand and individually we fall.</td>
<td>Discussion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Explain objectives</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25 Min</td>
<td>**MAIN PART ***</td>
<td>Discussion</td>
<td>White Board, Marker</td>
</tr>
<tr>
<td></td>
<td>Group &amp; its dynamics</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Criteria for Group</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Group dynamics</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Risky shift phenomenon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 Min</td>
<td>Stages of Group development</td>
<td>Lecture</td>
<td>LCD, Projector</td>
</tr>
<tr>
<td></td>
<td>Forming, Storming, Norming, Performing</td>
<td></td>
<td>Computer</td>
</tr>
<tr>
<td>15 Min</td>
<td>• Stages of SHG</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Criteria for SHG gradation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 Min</td>
<td><strong>CONCLUDING SESSION</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>– Summary, Review: Student</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>– Test</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>– Home work</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Subject: Small Animal Management, Project Planning and Social Mobilization

Topic Group Approach

Objective:

At the end of the lesson the students will be able to:

- Define a group
- Explain the conducive criteria suitable for formation of a group
- Describe different stages of Group development.
- Describe different criteria for SHG gradation

A group is:

- “two or more people who share a common definition and evaluation of themselves and behave in accordance with such a definition” (Vaughan & Hogg, 2002, p. 200)
- a collection of people who interact with one another, accept rights and obligations as members and who share a common identity.

Criteria for a group include:

- formal social structure
- face-to-face interaction
- 2 or more persons
- common fate
- common goals
- interdependence
- self-definition as group members
- recognition by others

Societies can be seen as large groups consisting of a myriad of sub-groups.
Introduction to Group Dynamics

Human beings exhibit some characteristic behavior patterns in groups. People involved in managing groups and group members themselves can benefit from studying theories and doing practical exercises which help them to better understand people's behaviour in groups and group dynamics.

When group patterns are combined with study of individual development, then group dynamics can also be applied to education and therapy (as is often the case in experiential, outdoor and adventure education).

People may underestimate the importance of society and group memberships on their lives. While people sometimes undertake our experiences of life involve being engaged with others and groups. The nature of these groups can be quite varied, from a family going for a walk, to the crowd at a football game, to an internet discussion group, to a group of fellow workers.

Given the diverse, yet common occurrence of groups, what is the nature and pattern of such group experiences? The social dynamics which occur within groups over time vary from group to group, but also illustrate some commonalities.

A classic example is the issue of what happens to groups over time? For example, Tuckman’s (1965) forming, storming, norming, performing model of group development is commonly used to describe the evolving experience and organization of adventure-based groups.

Group Dynamic

- Group development - How does a groups' pattern of behavior evolve and change over time? What are the stages of group development?
- Group size - Does the size of the group matter? How do the experiences of a group of 3 differ from a group of 30 from a group of 300 or 3000?
- Risky shift - Do people tend take risks in groups that they would be less likely to take alone?
- Social support - How important is fostering social support within personal development groups? What ingredients need to combined with social support to effectively facilitate personal and group growth and development?
- Group games & activities - What kinds of games and activities can be used to help people get to know one another and develop their interrelationships?
- Group mix -Group homogeneity versus heterogeneity? e.g., What is the effect of having groups consisting of people from one ethnicity compared to groups which are multi-ethnic? Is it better to create groups with diverse (heterogenous) or narrow (homogenous) membership?
• Group norms - What kinds of group norms evolve? What role does the facilitator play in the formation of group norms? What kinds of group norms should be established? (e.g., through a group contract and organizational culture) In what kinds of situations should a participant be excluded from a group?

**Risky Shift Phenomenon**

When people are in groups, they make decisions about risk differently from when they are alone. In the group, they are likely to make riskier decisions, as the shared risk makes the individual risk less.

They also may not want to let their compatriots down, and hence be risk-averse (this is sometimes called *cautious shift*). The overall tendency towards a shift in risk perception is also sometimes called *choice shift*.

There are a number of reasons as to why this might happen. Theories have included:

• Wallach, Kogan, and Bem (1964) proposed that greater risks are chosen due to a diffusion of responsibility, where emotional bonds decrease anxieties and risk is perceived as shared.

• Collins and Guetzkow (1964) suggested that high risk-takers are more confident and hence may persuade others to take greater risks.

• Brown (1965) indicates that social status in groups is often associated with risk-taking, leading people to avoid a low risk position.

• Bateson (1966) suggests that as people pay attention to a possible action, they become more familiar and comfortable with it and hence perceive less risk.

**Stages of group development**

Bruce Tuckman (1965) developed a 4-stage model of group development. He labelled the stages, Dr. Suess-style:

1. **Forming**: The group comes together and gets to initially know one another and form as a group.

2. **Storming**: A chaotic situation for leadership and trialling of group processes

3. **Norming**: Eventually agreement is reached on how the group operates (norming)

4. **Performing**: The group practices its craft and becomes effective in meeting its objectives.

5. **Adjourning**: The process of "unforming" the group, that is, letting go of the group structure and moving on.
What is the Ideal Group Size?

A well-cited theory by Walsh and Golins (1976) includes the claim that a group size of 10 is ideal for Outward Bound programs - not too large so that individuals get lost, not so small that a group lacks dynamic diversity. Group size of 6 to 16 is roughly ideal.

It is more practical to consider an optimal range - say 6 to 16. Besides practicalities (e.g., enrolments and resources), the group size may be adjusted according to age, maturity, experience, program goals, experience of instructor, program difficulty, etc.

It is important to realize that group dynamics take place regardless of group size and, ultimately, it is the dynamics rather than the actual number in a group which is most likely to effect psycho-social outcomes. Groups with sizes between about 6 and 16 are likely to experience similar processes and outcomes. This is also a common size for other intense group settings, e.g., group therapy.

Research - Group size doesn't matter - its the individual's quality of experience matters

From research on approximately 3000 participants in Outward Bound and related programs in Australia, no consistent effects of group size on life effectiveness outcomes were identified. Group sizes in the study ranged between 5 and 26.

This is not to say group size doesn't matter, but at least in this large study, no identifiable relationship between group size and personal development outcomes was evident. More powerful factors appeared to be the type of participant and type of program.

The equivocal impact of group size shouldn't seem that surprising -- after all, a brilliant person can facilitate change in many people, while millions of people can fail to change one person - what ultimately matters is the nature of experience/process - and this may or may not be related to group size.

Factors affecting Group Cohesiveness and performance:

i) Membership
   ▪ Size
   ▪ Compatibility
   ▪ Performance

ii) Work environment
   ▪ Nature of Task
   ▪ Physical Setting
   ▪ Communications
   ▪ Technology
Community Based Local Institutions

In order to mobilise the community for small animal development, it is helpful to use the services of community based local institutions, active in your area. Your influence in the village community is limited, as you are primarily an outsider. But these institutions are mostly rooted in the community. Such community level institutions may either be already existing or they may have to be created.

Examples of existing institutions are:

- Local NGOs
- Youth clubs
- Mahila samities.
- Watershed committee
- Panipanchayat/ Microproject

Self-help groups are an example of an institution which often has to be created and which can be used for social mobilisation.

Utilisation of Existing Institutions

Local NGOs

A number of NGOs may be operating in your area, carrying out a broad variety of developmental activities. You may integrate some of activities with theirs. However, in choosing the NGOs with whom you will establish such partnership, you need to be a little selective.

What type of NGO you should look for?

You may come across quite a few very big NGOs, which operate in a fairly large area, sometimes extending their activities beyond district or even the state boundaries. It may not be possible for you to collaborate with them. You should look for smaller grass-root level NGOs which maintain very strong links across many villages within your jurisdiction. Identify NGOs and try to collaborate with them to implement small animal programmes.
How can you involve NGOs in your extension work?

- You may involve these NGOs for awareness building on a wide range of activities, such as, organization of vaccination camps or upgradation of local stock.
- Some of these NGOs may also have sheep and goat as a component of their programme, like income generation with small animal farming. You may extend the AI services or vaccination programme among those animals. Once you start working with NGOs, new areas of cooperation will emerge as a result of your contact. Instead of duplicating efforts and thinly spreading scarce resources, such integration of efforts of the AHD and of the NGOs will result in more effective development.

Micro Projects/ Panipanchayats

Microprojects, Watershed committee and Panipanchayats are good platform for sharing of information on routine deworming, vaccination, fodder cultivation, pasture development.

You can link-up with these community level organisations for a number of your extension activities.

Mahila Samitis/ Youth Club

Youth clubs, Mahila Samitis can also be involved in your extension activities, particularly among the women farmers.

SELF HELP GROUPS

What is a Self-Help Group?

The idea of forming self help groups (SHG) is increasingly becoming a popular developmental approach. The programme has now become an essential component in most rural development programmes, whether sponsored by the state government or the centre.

An SHG is a small homogeneous group of 10 to 20 members, generally coming from the poorer sections of the rural community. SHG is formed, primarily with the understanding, that the members will take charge of bringing about changes in their own lives through their collective efforts without any dependence on external interventions. Poor men and women at individual level are often not able to change their situation. But if they are organized into groups, the group resources and human power will not only increase the development potential, but also their bargaining power in the society.
How will you organize a SHG?

It would be best if the poor men and women organize themselves into such SHGs. In reality, this does not often happen. Development agents, like you, have to play the role of organizer. In order to be able to organize SHGs, you need to know the techniques involved in it and the procedural requirements. The following is a set of board guidelines which you need to refer to while organizing an SHG in your area.

How can you utilise these SHGs in your extension activities?

Once you come across SHGs within the livestock keeping community, they can be utilised in a number of ways for extension purpose:

- These groups of men and women can be motivated to take up various types of income generating activities like sheep, goat units, pig units by way of mobilizing loans from the SHGs.
- The more successful ones from among these income generating units become your demonstration units for proving the feasibility of the modern small animal management practices.
- SHG meetings can be used for some important announcements, like dates and venue of vaccination camp; health camps, etc.
- Above all, with their raised income level, these families will become effective agents to spread messages from farmer to farmer.

Reference:
www.wilderdom.com/group/theory
Mullins, J. Laurie, Management and Organisational Behaviour
www.changingminds.org/explanations/theory
www.wilderdom.com/group
# LESSON PLAN-5

**Subject**: Small Animal Management, Project Planning and Social Mobilization  
**Topic**: Care and management of Pig  
**Lesson**: Theory / Practical  
**Number of Students**: 20  
**Duration**: 90min

## Objectives:
At the end of the lesson the students will be able to:
- Explain about the advantages of pig rearing
- Explain about the selection of pigs
- Explain about the housing systems of pigs
- Explain about the farrowing management of the exotic sow
- Explain about the care and management of pregnant sows, piglets and bucks
- Explain about the feeding of breeding boars, pregnant sows
- Analyse the importance of ration in pig management

## Materials, Tools, Equipments:
- LCD  
- Computer / Laptop  
- Screen

## Teaching Aids:
- Handout  
- PPT  
- BB/WB  
- Marker / Duster.

## Remarks:
<table>
<thead>
<tr>
<th>Time</th>
<th>Content : Steps / Key points</th>
<th>Methods</th>
<th>Aids</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 min</td>
<td>INTRODUCTION :</td>
<td>Brain storming</td>
<td>White board</td>
</tr>
<tr>
<td></td>
<td>- Interest raiser what are the methods of rearing of pig in scavenging or semi scavenging.</td>
<td>Discussion</td>
<td>LCD</td>
</tr>
<tr>
<td></td>
<td>- Regarding traditional method of rearing.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 min</td>
<td>MAIN PART :</td>
<td>Lecture</td>
<td>White board</td>
</tr>
<tr>
<td></td>
<td>- Different types of feed</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Feed i.e. water requirement for different category of pigs</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Care and management of pregnant sows, piglets, Boar</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Housing requirements of pigs</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Recommended ration and feed conversion</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Water requirement of pigs</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Feeding schedule for piglet, grower, furnisher, breeding &amp; pregnant Prepare feed formulation using locally available feed ingredients.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 min</td>
<td></td>
<td>Discussion</td>
<td>LCD</td>
</tr>
<tr>
<td></td>
<td>- Use of non conventional feed resources like azolla.</td>
<td></td>
<td>White Board</td>
</tr>
<tr>
<td></td>
<td>- Handling methods of Pigs.</td>
<td></td>
<td>LCD</td>
</tr>
<tr>
<td></td>
<td>- Flock management (sow, boar, piglet, pregnant &amp; lactating sow, maintenance of hygienic condition</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 min</td>
<td>CONCLUDING SESSION :</td>
<td>Discussion</td>
<td>White board.</td>
</tr>
<tr>
<td></td>
<td>Summarization and comparison of basic hygienic management</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Subject: Small Animal Management, Project Planning and Social Mobilization

Topic: Care and management of Pig

Objective:
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- Analyse the importance of ration in pig management

Pigs are reared mainly for meat purpose. Pigs are prolific. Sows give birth 8 – 12 piglets per litter and two litters are produced in a year. Pigs require low investment and give quick return. Pigs are good consumer of waste products. It is having high dressing percentage.

Still in India Pig farming has not progressed satisfactorily due to (1) Social barrier (2) Low cost of pork in most parts of the country (3) Lack of proper technical know how. (4) Non-availability of suitable foundation stock (5) High price of pig feed etc.

Pig farming can minimize poverty, protein malnutrition and also can improve the economic condition of the weaker sections of society. Unemployed youths can be self employed by pig farming.

Different managerial practices in pig rearing

(1) Care of the naval cord:

The piglets are taken out of the farming pen soon after their births. The naval cord of the piglet is tied off 1" from the abdominal wall using a square knot with a string. The cord below the knot is then cut off by using a disinfected scissors about ½ ” from the knot. Tincture Iodine is applied on the surface. The cord dries off & drops in 4-5 days time.
(2)  **Clipping of needle teeth:**

Piglets are born with 8 no. of well developed but sharp temporary teeth known as needle teeth / Wolf teeth. 4 of these teeth are located on the sides of the upper & lower jaws. These teeth cause injuries to the sows udder & also to other piglets, hence it is desirable to clip these teeth within 24 hours of birth.

The piglets should be taken out of the furrowing pen and restrained. The mouth is opened, so that the teeth are exposed. A pair of disinfected clipper is used for cutting the needle teeth. The teeth were cut at the level of gum, one teeth at a time. Care should be taken not to cut the gum.

(3)  **Iron dextran Injection:**

Iron injects are routinely given to piglets. Since deficiency anemia is common among piglets because of low storage of iron in the body of piglets & also because of the low iron content of the sow’s milk. Piglets which are having no access to soil develop iron deficiency anemia within 7-10 days of births if iron is not administered to them. Iron is administered soon after birth. The symptoms of anaemia in piglets include weakness, rough hair, wrinkling of the skin, pale mucous membrane, diarrhoea & low resistance to infection & sudden death. Fe injects may be given within 3-4 days after births. A single dose of 150-200 mg of Fe is normally sufficient. In case the piglets are not provided with creep feed a 2nd dose may be necessary before weaning. Fe is administered intramuscularly in the neck or ham region. Ferous Sulphate 5% solution with 5% sugar can be painted in the teat of the sow.

**Restrainting of swine –**

Restraining young and light weight pigs is done by – (i) restraining the pig by side (ii) Restraining by holding its front hogs. (iii) Restraining by holding its hind legs. Restraining of older and heavier pigs is done by – (i) using a snare (ii) Laying the pig on its side (iii) Using a head gate.

**Ear notching:**

The swine enterprise require both financial and production records to identify strengths and weakness in the operation. Ear notching is the most used method and for baby pig, identification. Ear notching is the process of removing a portion of the ear. The notches grow as the pig grows. The most common individual pig and litter ear marking system is the shown in the diagram. In the the identification method of the purebred swine association in the U.S the litter no. is notched in the pig’s right ear and individual pig no. in the pig’s left ear (as per a key).

**Castration:**

It is a process of removing the testicles of the male pig. The male pigs reared for market purposes, are castrated in order to eliminate the boar odour in the meat. Piglets may be castrated between 10-20 days of age. If done earlier it may be difficult to find the testicles & if done later there may be more bleeding.
Weaning – Weaning of the piglets from their mother should be done at 8 weeks and should be fed thrice a day.

Deworming - After weaning deworming should be done with Valbagen, Panacur (Albendazole) (Mebendazole) etc.

Vaccination - Swine fever vaccine should be given at 2 – 4 weeks of age.

The pigs should also be vaccinated against H.S and FMD.

Wallowing / Sprinkling – Wallow should be provided or provision of spraying or sprinkling should be made to save the pigs from heat stress as due to heat stress there will be less body weight gain and poor feed efficiency.

**Housing of Pigs**

Guiding factors for choosing systems of housing are –

(a) Size of enterprise
(b) Type of pigs to be produced.
(c) Availability of land.
(d) Climatic conditions.

In case of small farms with small holdings no special purpose pig house is needed but in a specialized farm accommodating a large number of pigs, there may be a necessity for constructing special purpose houses for different categories of stock.

Sty – A dwelling space consisting of 1 or more pens.

Pen – A part of a sty for housing single or group of pigs. It has a covered area and an adjoining open yard, the covered area providing space for feeding and watering and the open yard for exercise and also for staying in favourable part in different weather or temperature.

**Table-1: General plan of sties for different categories of pigs.**

<table>
<thead>
<tr>
<th>Category</th>
<th>Under one roof each sty should not have more than</th>
<th>Each pen should have</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boar sty</td>
<td>24 pens</td>
<td>One pig</td>
</tr>
<tr>
<td>Dry sow and gilt sty</td>
<td>40 pens</td>
<td>One pig in bigger farms (in small farms 2-10)</td>
</tr>
<tr>
<td>Farrowing sty</td>
<td>40 pens</td>
<td>1 pig with litter</td>
</tr>
<tr>
<td>Fattening sty</td>
<td>20 pens</td>
<td>16-32 pigs</td>
</tr>
<tr>
<td>Weaner sty</td>
<td>30 pens</td>
<td>10-20 pigs</td>
</tr>
<tr>
<td>Sick animal sty</td>
<td>Depend on no. of pigs kept. Accommodation of 5% of the stock for sick pigs.</td>
<td></td>
</tr>
</tbody>
</table>
Table -2: Manger and Water trough specification for Pigs.

<table>
<thead>
<tr>
<th>Type of Animal</th>
<th>Width of manger/water trough (cm)</th>
<th>Height in cm</th>
<th>Depth (in cm)</th>
<th>Manger length / animal (cm)</th>
<th>Water trough length / animal (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult pigs</td>
<td>50</td>
<td>20</td>
<td>20</td>
<td>60-75</td>
<td>6-7.5</td>
</tr>
<tr>
<td>Growing pigs</td>
<td>30</td>
<td>15</td>
<td>15</td>
<td>25-25</td>
<td>2.5-3.5</td>
</tr>
</tbody>
</table>

Guard rails should be provided in the farrowing pen 25 cm above the floor level and 25cm from the wall for avoiding crushing of the piglets between the sow and the wall.

Creep or compartment for piglet should be provided in the farrowing pen by erecting a wall of about 1.2 m height on one side of covered area with an opening of about 30 cm, so as to allow only piglets inside where small feeding & water troughs provided.

Floor – It should be cement concrete & roughened.

Drain – Minimum width of 25 cm and gradient of 2.5 cm in every 10 meters.

Walls – The height of the walls should be 1.2 m – 1.5 m from floor level.

Roof – Height of roof of centre should be 3.7 m and 2 – 2.5 m at rear. Asbestos sheets are lommen roofing materials as cheap, insulating and light in weight.

Door – Main door of sty should be 1.2 – 1.5 m width and 1.5 – 2m in height. Door of individual pen should be 0.75 to 1m.

Wallowing tank – In hot climate, wallowing tank of minimum depth of 15-20 cm should be provided in open yard.

Subsidiary building

In addition to the pig houses mentioned above a commercial piggery project might require weighing yard and store building.

Weighing yard – It is needed to record weights of pigs regularly. Weighing platform weighing machine, weighing room and holding pen should be there in weighing yard.

Store building-- The building should have a store keeper’s office a mixing room for feed, a room for keeping miscellaneous items (equipments) and a feed store.
Table-3 : Floor space requirement of Pigs

<table>
<thead>
<tr>
<th>Type of animal</th>
<th>Covered floor area per animal (m²)</th>
<th>Typical dimension</th>
<th>Open pard area per animal (M²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boar</td>
<td>6.25 – 7.50</td>
<td>2.5 x 2.5 – 2.5 x 3.0</td>
<td>8.8 – 12.0</td>
</tr>
<tr>
<td>Furrowing sow</td>
<td>7.50 – 9.00</td>
<td>2.5 x 3.0 – 3.0 x 3.0</td>
<td>8.8 – 12.0</td>
</tr>
<tr>
<td>Weaner / fattening pigs</td>
<td>0.96 – 1.80</td>
<td>0.8 x 1.2 – 1.2 x 1.5</td>
<td>8.8 – 12.0</td>
</tr>
<tr>
<td>Dry sow / Gilt</td>
<td>1.80 - 2.70</td>
<td>0.8 x 1.2 – 1.2 x 1.5</td>
<td>1.4 – 1.8</td>
</tr>
</tbody>
</table>

Feeding of Pigs

The recommended levels of crude protein (in per cent) in swine rations are – creep feed → 17 – 18, pigs from weaning to 40 kg → 15 – 16, pigs from 40-90 kg → 13-14, breeding boars and nursing sows → 15 – 16, dry sows → 14.

Table – 4 : Computation of ration for feeding Pigs.

<table>
<thead>
<tr>
<th></th>
<th>Creep feed (14th to 56th day)</th>
<th>Grower ration weaned (pigs upto 40 kg)</th>
<th>Finisher ration (40 kg to marketing)</th>
<th>Pregnant &amp; nursing sows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maize</td>
<td>65</td>
<td>50</td>
<td>45</td>
<td>50</td>
</tr>
<tr>
<td>GNOF</td>
<td>14</td>
<td>18</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Wheat bran</td>
<td>10</td>
<td>20</td>
<td>25</td>
<td>18</td>
</tr>
<tr>
<td>Fish meal</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Molasses</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Min. Mixture</td>
<td>1</td>
<td>1.5</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>Salt</td>
<td>-</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
</tr>
</tbody>
</table>

Table -5 : Feed consumption of pigs

<table>
<thead>
<tr>
<th>Weight of pig (kg)</th>
<th>Daily feed consumption (kg) per pig</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>2.0</td>
</tr>
<tr>
<td>50</td>
<td>3.2</td>
</tr>
<tr>
<td>100</td>
<td>5.3</td>
</tr>
<tr>
<td>150</td>
<td>6.8</td>
</tr>
<tr>
<td>200</td>
<td>7.5</td>
</tr>
<tr>
<td>250</td>
<td>8.3</td>
</tr>
</tbody>
</table>
Table -6 : Water requirement of pigs.

<table>
<thead>
<tr>
<th>Water</th>
<th>Requirement (in litter)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boar</td>
<td>20 to 25</td>
</tr>
<tr>
<td>Growing pig</td>
<td>3.5 to 8</td>
</tr>
<tr>
<td>Pregnant sow</td>
<td>10 – 20</td>
</tr>
<tr>
<td>Sow with litter</td>
<td>20 to 35</td>
</tr>
</tbody>
</table>

Pigs can be fed with residual food of hotels, hostels, mess etc. This residual food may be boiled, then cooled and fed to pigs. The residual vegetables of vegetable market like potato, tomato, cabbage can be fed. For profitable pig farming feed cost should be reduced by substituting concentrates by this type feed. Where cost of pork is high even rearing pigs with total concentrates will be profitable.

**Suggested replacement for Feeds**

1. Maize by cereals like brown rice, wheat, bajra/sorghum, barley.
2. GNC by linseed cake, coconut cake, sesame cake, Soya bean cake.
3. Fish meal/skim milk powder

**Note:**

1. Vitamins are not necessary if pigs are fed fresh green legumes like Lucerne, cowpea, berseem.
2. Feed costs about 80% of the enterprise hence great care must be taken in computation of ration.
3. The ration must be economical, nutritious, capable of providing nutrients according to needs.
4. Incorporate vegetable wastes, left over feeds, refuse from hotels and restaurants damaged food grams unsuitable for humans consumption etc to minimize cost of ration.
5. Fresh drinking water must be made available at all times.
6. Green leguminous fodder @ 1-2 kg. per day/adult animal may be fed.
7. Pre starter pigs ration must have protein 24 percent and low fiber contents. Piglet start nibbling food when they are about 1 week old. They consume about 1.5 to 2 kg. feed to attain 5 kg. body weight.
8. Piglets are prone to anemia therefore to prevent anemia. Sow’s udder may be swabbed with iron sulphate mixed with sugar or else imp heron, Iron injection may be given on 4th and 14th days of age.

**Characteristic features of swine nutrition:**

1. Pig is a simple stomach animal and cannot utilize fibrous food efficiently.
2. Pig rations should have more concentrates and less roughages, it should be high in energy, low in fibre and supplemented with protein.
3. Pig is an efficient converter of concentrates into meat. The feed conversion ration is 1:3.
4. As pigs need more water they should be given free access to fresh water.
5. Most economical ingredients should be selected for feeding of pigs. Feed costs about 80% rearing.
So great care should be taken while computation of ration.

6. No vitamin supplement is necessary if this pigs are allowed to pasture or are fed fresh green legumes like Lucerne, cowpea and berseem.

7. Pigs can very well utilize kitchen garbage and left out feed of hotels, pantry cars.

Marketing of Pigs –

Pigs grow 1kg by eating 3 to 3.5 kg concentrate. So those who rear pigs in intensive farming should market the pigs before decline in their feed efficiency. By feeding concentrate the pigs attain about 60 kg at 6 months. They should be sold at this time because after that they will eat more and grow less. But those small farmers who rear few pigs and allow pigs to outside at day time incur less expenditure as the pigs collect food outside and only kitchen wastes etc. given. So these pigs can be raised for longer period and higher weight.

Rate of pork is high at North Eastern States. If a commercial pig farm owner takes his pigs and sell in these states will get better profit as cost of pork is very high there.

Exotic breeds in India-----Major Exotic breeds available in India Large white Yorkshire, Landrace & Hampshire etc.

Characteristics of pigs

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gilts first come to heat at</td>
<td>8 to 10 months</td>
</tr>
<tr>
<td>Comes to heat at</td>
<td>21 days interval</td>
</tr>
<tr>
<td>Length of heat period</td>
<td>2 to 3 days</td>
</tr>
<tr>
<td>Pregnancy period</td>
<td>114 days</td>
</tr>
<tr>
<td>Litter born per year</td>
<td>Twice</td>
</tr>
<tr>
<td>Occurrence of heat after weaning</td>
<td>2 to 10 days</td>
</tr>
</tbody>
</table>

Symptoms of heat in sow –

1. Restlessness
2. Enlarged genital opening
3. Frequently mounts other sows
4. Sometimes peculiar loud grunting sound.

Breeding of Pigs –

The following procedures may be adopted for breed improvement.

1. Intensive selection and out crossing (mating of unrelated individuals of same breed) is the best procedure.
2. In India large population of pigs are indigenous non-descript pigs. These pigs can be graded up by successive use of boars either of large white Yorkshire or Landrace breed.
3. Crossing among breeds is called cross breeding. Exp- Cross breeding can be practiced by crossing Yorkshire sows with a Landrace boar or vice-versa. Single crossing is mating of a boar and a sow of two different breeds. All the crossbred pigs will be marketed and the cross is repeated for the next crop of pigs.
4. Alternate use of boars of two breeds on the female stock produced in a herd is criss crossing. Cross breeding can increase growth rate, litter size and livability.
## LESSON PLAN-6

<table>
<thead>
<tr>
<th>Subject : Small Animal Management, Project Planning and Social Mobilization</th>
<th>Number of Students : 20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topic: Common diseases of Pig and their prevention.</td>
<td>Duration :</td>
</tr>
<tr>
<td>Lesson : Theory / Practical</td>
<td>90 Min</td>
</tr>
</tbody>
</table>

### Objectives :
At the end of the lesson the students will be able to
- List the common bacterial, viral, parasitic & deficiency diseases of pigs.
- Describe the methods of collection, preservation & dispatch of clinical sample.
- Explain the Pathognomonc PM lesions of common diseases.
- Describe the deworming & vaccination schedule.

### Materials, Tools, Equipments :
- LCD
- Computer / Laptop
- Screen

### Teaching Aids :
- Handout
- PPT
- BB/WB
- Marker / Duster.

### Remarks :

---


<table>
<thead>
<tr>
<th>Time</th>
<th>Content : Steps / Key points</th>
<th>Methods</th>
<th>Aids</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 min</td>
<td>INTRODUCTION :</td>
<td>Brain storming</td>
<td>White Board</td>
</tr>
<tr>
<td></td>
<td>What are the signs or diseases in pig?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 Min</td>
<td>MAIN PART :</td>
<td>Lecture</td>
<td>LCD</td>
</tr>
<tr>
<td></td>
<td>- Bacterial disease: HS, Anthrax, Swine erysipelas</td>
<td></td>
<td>White Board</td>
</tr>
<tr>
<td>10 Min</td>
<td>- Viral : Hog Cholera, Swine influenza, vesicular exanthema, FMD</td>
<td>Discussion</td>
<td></td>
</tr>
<tr>
<td>10 Min</td>
<td>- Parasitic: Ascaris, Stomach, Worm, lung, warm, kidney warm &amp; tape worm.</td>
<td>Discussion</td>
<td></td>
</tr>
<tr>
<td>10 Min</td>
<td>- Deficiency: Piglet Anaemia.</td>
<td>Lecture</td>
<td>LCD/LCD/White Board</td>
</tr>
<tr>
<td>10 Min</td>
<td>- Diseases of zoon tic importance.</td>
<td>Lecture</td>
<td></td>
</tr>
<tr>
<td>10 Min</td>
<td>- Collection, preservation &amp; dispatch of clinical sample.</td>
<td>Discussion</td>
<td></td>
</tr>
<tr>
<td>10 Min</td>
<td>- Pathognomonic PM lesions of common diseases.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Deworming &amp; vaccination schedule.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 Min</td>
<td>CONCLUDING SESSION :</td>
<td>Discussion</td>
<td>White Board.</td>
</tr>
<tr>
<td></td>
<td>- Summarization of topic.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Subject: Small Animal Management, Project Planning and Social Mobilization

Topic: Common diseases of Pig and their prevention

Objective:
At the end of the lesson the students will be able to:

- Explain about the advantages of pig rearing
- Explain about the selection of pigs
- Explain about the housing systems of pigs
- Explain about the furrowing management of the exotic sow
- Explain about the care and management of pregnant sows, piglets and bucks

The diseases of pigs may be caused by virus, bacteria or protozoa.

Pigs are also susceptible to internal parasites such as round worms and tape worms and to attack by external parasites such as lice and mites. Careful observation will often allow the pig rearer to identify animals which are sick or have infestation of parasites.

The sick pig may show the symptoms listed below:

- Off feed or less interest in feed
- Difficulties in breathing
- Harsh, gasping breath and/or coughing
- White pigs with flushed (red) skin
- Restless appearance drooping ears, dull eyes, dry snout, limp tail and lack of luster of hair and skin
- Loose motion or bloody dung
- Restlessness, drooping ear, abnormal walk
- Skin lesions (either red/rough/urticarial)

Any of these signs may be indicators of sickness and a pig showing one or more of these symptoms should be carefully examined to determine the cause. Early treatment is more useful and efficient and less expensive than later treatment.
Viral and bacterial infections of pigs are often very contagious and any pig with a high temperature or symptoms of a contagious disease endemic to your area should be examined by a veterinarian.

Common Diseases of Pig

- Bacterial: Swine Erysepalas, HS, Anthrax
- Viral: Hog Cholera, FMD, Vesicular Exanthema
- Parasitic: Kidney worm, Round worm, Thread worm, Whip worm
- Deficiency Diseases: Piglet Anemia

1. Anthrax:

It is caused by Bacillus Anthracis. The germ reaches the pig through the contaminated feedstuffs, from the eating of unboiled swill containing the flesh of affected animals.

There are two types of Anthrax in pigs.

i. Throat and neck form
ii. Abdominal type

In the throat and neck type, the pig runs high temperature, oedema under the jaw and difficult breathing. Oedema rapidly larger and causes vomiting and death follows. Penicillin injections can be administered for cure.

In the abdominal type of anthrax the pig may die suddenly. It runs a high temperature and passes blood stained diarrhea.

Prevention – There is an antiserum against Anthrax but the disease is comparatively uncommon in pigs.

This is an uncommon disease of pigs in most parts of the world. Care however should always be taken in handling diseased pigs or carcasses because anthrax is communicable to people. Effective vaccines are available in some countries for both pigs and people.

Symptoms

- Acute illness.
- Bloody faeces.
- Haemorrhage from the nose.
- Fever.
- Respiratory distress.
- Sudden death.
- Swollen discoloured neck.
- Blue skin.
- Unusual in piglets
Causes / Contributing factors

- Contaminated feed or water.

Diagnosis

Anthrax should be suspected if a sow is found dead and post-mortem examination shows copious blood tinged tissue fluid and large red lymph nodes under the skin of the neck and in the abdomen. The post-mortem examination should be discontinued immediately and veterinary help sought.

Swine Erysepalas

This is also called diamond skin disease and having zoonotic importance.

Symptoms:

- Onset of the disease is sudden, constant high rise of temp, death may be sudden, lesions are marked after death.
- Stiffness and discomfort when walking
- Diamond shaped pink to dark diamond shaped lesions
- Still birth in sows
- These are symptoms of acute erysipelosis. In sub acute, no temp, only skin lesions. In chronic cases arthritis is common.

Treatment:

- Swine erysipelas is very susceptible to penicillin which is the medicine of choice.
- Usually a single injection is adequate but in severe cases it is necessary to repeat this two to three days later. The normal dose rate would be 1ml/10kg body weight.
- In acute cases a quick acting penicillin injected twice in the first 24 hours should bring about a rapid response. Continue daily injections for 3-4 days.
- Where a large number of sows are involved water medication with amoxicillin or phenoxy-methyl penicillin should be carried out. The dose level will depend upon the purity of the antibiotic powder used. In prolonged outbreaks in-feed medication using 200-300g/tonne of phenoxyethyl penicillin for two weeks should control disease.

Control:

Vaccination - In the breeding herd all the females and males should be vaccinated. Reasonably effective killed vaccines are available and two doses would normally be given 2 to 4 weeks apart.

Haemorrhagic Septicemia

Hemorrhagic septicemia is caused by Pasteurella multocida.
Symptoms:

- Severe sudden pneumonia affecting all the lung tissue.
- High temperatures.
- Discharges from the nose.
- High mortality.
- Pigs show rapid breathing.
- Blue discolored skin particularly on the extremities of the ears (caused by toxins or heart sac infections).

Control:

- By vaccination with Alum adjuvant vaccine
- S/Cly, every six months
- 5ml below the ear in the region of neck

Viral Disease

Swine Fever:

It is an acute contagious, viral disease.

An initial attack of virus produces multiple hemorrhages in the body. The other typical symptoms are chronic foetid diarrhea, ulcerated gut, coughing and pneumonia and sudden death occurs from acute septicemia.

Swine fever is one of the most important virus diseases of pigs. It is notifiable in most countries of the world.

The pig is the only natural host. The virus is spread from infected or carrier pigs via discharges from the nose, mouth, urine and faeces or infected semen and it is highly contagious. The virus survives in frozen carcasses for long periods of time.

Control is by slaughter or as a last resort by vaccination. African swine fever (ASF) and Classical Swine fever are caused by very similar viruses which are only distinguishable by laboratory testing.

Symptoms

- Multiple hemorrhages in the body like under belly, inner side of legs
- Foetid diarrhea, ulcerated gut
- Dog sitting position in sows
- Chilling and vomiting in piglets, piglets huddle together
- Blue discoloration of skin
- Fever (106 degree F)
- Sudden death
**Diagnosis**

CSF is a rapid spreading disease with high mortality. There are characteristic post-mortem changes with haemorrhagic lymph nodes, dead patches in the spleen, multiple small haemorrhages in the kidneys and so-called "button ulcers" in the gut.

Laboratory tests include the identification of viral antigen, isolation of the virus and the presence of antibodies in serum. In most countries CSF is notifiable.

**Control:**
- Generally vaccination against hog cholera is not practiced.
- In enzootic and high risk areas routine vaccination is practised and may be compulsory.

**Foot and Mouth:**

It is caused by a virus.

**Symptoms:**
- Vesicles in snout, mouth
- No vesicles around coronet
- In severe cases, may be lameness
  
  Foot-and-Mouth disease should always be considered if sudden widespread lameness appears with vesicles or blisters on the snout, tongue and tops of the claws. In most countries it is notifiable and if suspected must be reported to the authorities immediately. Salivation is an obvious symptom.

  In pigs early signs are lameness a drop in food consumption and some pigs appear depressed and have fevers of about 40.5°C,(105°F). In piglets sudden death due to cardiac failure is common.

**Parasitic Infestation in Pigs**

Pigs are susceptible to infestation by round worms and tape worms. The round worms may cause loss of vigour, loss of weight and abnormal respiration. Tape worms are especially important as the stage which is found in pigs is a part of the life cycle of the tape worm which infests humans. In cases where tape worms are endemic, pigs normally contract them by contact with human faces. Since infestation in the pig carcass may lead to condemnation of part or all of the carcass, proper disposal of human faces is important. Since infestation in the pig carcass may lead to condemnation of part or the entire carcass, proper disposal of human faces is important.
Round Worms (*Ascaris suum*):

It is found in the small intestine of pigs. Heavily infested pigs may have up to 250 worms blocking the small intestines and bile duct causing loss of appetite, vomiting and death. Pigs 6 to 12 weeks old are the most seriously affected, while mature pigs may carry the worms without ill effect.

Pigs with worms can be treated with a variety of compounds of which the piperazine compounds provided in the feed or water are probably the most common.

Kidney Worm:

The adult kidney worm (*Stephanurus dentatus*) is located in fibrous cysts in the pig's kidneys, uterus, flare fat, loin muscles and sometimes the spinal cord. The adult worms the cysts contain a greenish pus. The immature or larval form is often found in the liver.

Tapeworm:

Cysticercosis is an infection caused by the pork tapeworm, *Taenia solium*. The pork tapeworm can live for over 20 years, producing several thousand eggs daily. One tapeworm can shed up to 300,000 eggs per day. Pigs usually do not show signs of infection. A cysticerci infection (commonly referred to as measly pork or pork measles) is usually only found when the meat is inspected.

External Parasite

Lice and mites on the skin cause severe itching and the pigs will be seen rubbing fences and the sides of the pens. Severe cases of mite infestation (mange) may appear as scabby looking areas on the skin. Treatment of both of these conditions is the use of chemicals such as those used for dipping cattle. Normally these products will contain in formation on the label for the concentration to use on other classes of livestock also. Once the material has been mixed it is poured over the pig, making sure that all parts are thoroughly wetted. Repeated treatments may be required to clear up an infestation. If pigs become infested, their quarters should also be treated as the pigs may be reinfested from unclean buildings or equipment.

Deworming:

- Doramectin-(Pfizer) 200 micro gm/kg bw, I/M, S/C route- Sensitive to internal and external parasite
- Ivermectin- 200 micro gm/kg bw, S/C or Oral, sensitive to kidney worm, lung worms, roundworms (Bomectin)
- Ivermectin inj- sensitive to both internal and external parasites
- Piperazine as citrate- 200-300 mg/kgbw-round worms

Both the adult and piglets need to be given medicine-mixed in the feed, separately.
Heat Stroke
This usually occurs where ventilation has failed or in extremely hot weather.

Symptoms
Piglets
- Uncommon, but as for sow.

Sows, Weaners & Growers
- Distress.
- A very high respiratory rate.
- Muscle trembling.
- Skin red.
- Weakness.
- Prostration.
- Vomiting.
- Diarrhoea may be seen.
- Rectal temperature may rise to 43 °C (109 °F)

Causes / Contributing factors
- High temperatures.
- Exposure to sunlight.
- Combined with high humidity and poor ventilation in indoor housing.

Diagnosis
The history and clinical signs.

Treatment
- Give immediate treatment
- Immerse the animal in cold water or spray
- Dribble cold water into the rectum using a flutter valve

Vaccination Schedule in Pig
The timing, frequency and route of administration of injectable vaccines are important if the maximum protection from the vaccine is to be attained.
When using a vaccine, follow the vaccine manufacturer's recommendations. Injectable vaccines stimulate a tissue reaction at the site of injection. The recommended injection site is the neck. The hypodermic needles can break during vaccination due to poor restraint of the vaccinated pig. It is important that the pig is restrained so that vaccination can be carried out effectively.

Hygiene is important and syringes or vaccinators must be clean and maintained. Clean off any organic matter or dirt in warm soapy water and rinse thoroughly. Sterilise by either boiling for 15 minutes or immersing in an approved disinfectant, then rinse with sterile water.

**Epidemic Disease Vaccination:**

1. **Haemorrhagic Septicaemia (throat)** H.S. oil adjuvant vaccine once a year by deep intramuscular route injection, 1ml.
2. **Swine Fever** – Viral live vaccine (freeze dried) 1ml S/C
3. **Anthrax** – 1 ml. S/C
<table>
<thead>
<tr>
<th>LESSON PLAN-7</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Subject:</strong> Small Animal Management, Project Planning &amp; Social Mobilisation</td>
</tr>
<tr>
<td><strong>Topic:</strong> Participatory Project Planning</td>
</tr>
<tr>
<td><strong>Lesson:</strong> Theory / Practical</td>
</tr>
</tbody>
</table>

**Objectives:**
At the end of the lesson the participants will be able to....
- State steps of Participatory Project Planning
- Explain procedure for Problem Identification
- Explain procedure for Solution analysis
- State process of developing Action Plan

**Materials, Tools, Equipment:**
(for Practical in the Field, Lab.)

**Teaching Aids:**
(AV Aids, Information Sheet, Assignment Sheet, Test etc.)
- White Board, Marker, handout, Brown sheet, Permanent marker

**Remarks:** (Notes for changes and adaptations of the lesson plan, for use in future classes)
<table>
<thead>
<tr>
<th>Time</th>
<th>Content: Steps/ Key Points</th>
<th>Methods</th>
<th>Aids</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 Min</td>
<td><em>INTRODUCTION</em></td>
<td></td>
<td>Discussion</td>
</tr>
<tr>
<td></td>
<td>Why planning?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>It saves time, money, effort and reduces many problems.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Explain objectives</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 Min</td>
<td>**MAIN PART *</td>
<td></td>
<td>讨论</td>
</tr>
<tr>
<td></td>
<td>Salient features of Participatory Project Planning</td>
<td></td>
<td>白板，黑板，笔</td>
</tr>
<tr>
<td></td>
<td>- Steps in project planning (Goal deliverable, schedule, human resource plan, communication plan, risk management)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Participatory planning process.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 Min</td>
<td>Problem Identification – Cause &amp; Effect relationship</td>
<td></td>
<td>Lecture</td>
</tr>
<tr>
<td>20 Min</td>
<td>Solution analysis – Means and end Action Plan Preparation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 Min</td>
<td>Implementation and monitoring of planned activities.</td>
<td></td>
<td>Group discussion</td>
</tr>
<tr>
<td></td>
<td><strong>CONCLUDING SESSION</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>– Summary, Review: Student</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>– Test</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>– Home work</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Subject: Small Animal Management, Project Planning & Social Mobilisation

Topic: Participatory Project Planning

Objective:

At the end of the lesson the students will be able to:

- State steps of Participatory Project Planning
- Explain procedure for Problem Identification
- Explain procedure for Solution analysis
- State process of developing Action Plan

Project Planning A Step by Step Guide

The key to a successful project is in the identification of core problem and its associated causes. Elimination / minimizing of all the identified causes by planning suitable interventions should be the aim of the plan. Developing a project plan is the basic foundation before we undertake any kind of project.

Very often we come across many projects launched in the field with some guidelines. With the available guidelines it is not fair to enter directly into implementation phase without passing through planning phase.

Project Planning

Project Formulation is “Preparing a blueprint of any development programme to be undertaken to effect a change as an answer to a problem in specified time for the benefit of the needy people of a particular area.”

Every Development Project Has Four characteristic:

- It has a specific aim:
- It is in instrument of change:
- It involves cost, resources and skills:
- It provides concrete time bound result.

These basic elements of any project are:

- Problem
- Solution
- Support
This means identifying a problem, planning a solution and making an estimate of the cost involved.

The key priorities of any project should be:

- Need-Based
- Appropriate
- Participatory
- Benefiting many

**Characteristic of Project**

**A Project:**

- has specific purpose which can be readily defined
- is unique because it is most unlikely to be repeated in exactly the same way by the same group of people to give the same results:
- is focused on the customer and customer expectations:
- is not usually routine work but many include routine type tasks;
- is made up of a collection of activities that are linked together because they all contributes to the desired result:
- has clearly defined and agreed time constraints – a date when the result are required:
- is frequently complex because the work involves people in different departments and even on different sites:
- has to be flexible to accommodate change as the work proceeds:
- involves many unknowns both within the work itself, the skills of the people doing the work and the external influences on the project:
- has cost constraints which must be clearly defined and understood to ensure the project remains viable ate all times:
- provides a unique opportunity to learn new skills:
- forces you to work in a different way because the ‘temporary’ management role is directly associated with the life of the project;
- challenges traditional lines of authority with perceived threats to the status Quo;
- involves risk at every step of the process and you must manage these risks to sustain the focus on the desired results;
Logical Framework matrix

Logical Framework matrix is a visually oriented planning tool that uses 4 rows and 4 columns. The project purpose, results, activities and corresponding assumptions and ‘pre-conditions’ of an intervention are presented in the first and fourth column. The second and third columns are used to specify the objectives mentioned in the 1st col with objectively verifiable indicators and means of verification.

With the assistance of Logical Framework following three major tasks can be accomplished:

A. Analysis of the situation
B. Planning
C. Application

Analysis of the situation
1. Analysis of the problems (image of reality)
2. Analysis of objectives (image of an improved situation in the future)
3. Analysis of strategies (comparison of different ‘chains of objectives’)

Problem analysis
- Analyse the existing situation surrounding a given problem condition
- Identify the major problems in this context and establish a hierarchy
- Define the core problem of a situation
- Visualize the cause and effect relationships in a diagram

Objective analysis
- Describe the situation in the future once the problems have been remedied
- Verify the hierarchy of the objectives
- Illustrate the means-end relationships in a diagram

Strategy analysis
- Identification of different possible strategies to achieve the project purpose
- Choice of the project strategy.

DIAGNOSIS OF PROBLEMS

Farmers often come to you with a series of Problems, like diseases of their livestock, poor growth of their goats, or death of piglet. In simple terms, we can explain a ‘problem’ as a gap between a desired situation and an actual situation and each problem must have one or more cause(s) and one or more effect(s).
See the following example

Example: Diseases of Goat – causes and effects.
If the problem of a farmer is diseases of his/her goat, then

<table>
<thead>
<tr>
<th>What could be the cause(s) of the problem?</th>
<th>What could be the effect(s) of the problem?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malnutrition?</td>
<td>Low body growth?</td>
</tr>
<tr>
<td>Worm infestation?</td>
<td>Even death of goat?</td>
</tr>
<tr>
<td>Contagious diseases?</td>
<td>Economic loss and increased poverty for the farmer.</td>
</tr>
<tr>
<td>Mineral deficiency?</td>
<td></td>
</tr>
<tr>
<td>Lack of knowledge about the management practices?</td>
<td></td>
</tr>
<tr>
<td>Something else?</td>
<td></td>
</tr>
</tbody>
</table>

In such case you first need to analyze the causes and effects of the problem and decide the main cause(s) of the problem, before you can give the appropriate advise to solve the problem,.  

**IDENTIFICATION OF SOLUTIONS**

In the previous step the diagnosis of problems has been discussed. Problems are often manifold, and have causes and effects. Therefore, the extension worker, along with the farmers, has to decide:

- Which problem or cause needs to be addressed first and which next? This process is called prioritization of problems.
- What are the alternative solutions?
- Which is the most preferred solutions?

**Example:** diseases of goat and solutions

What are solutions for the 2 causes such as (a) worm infestation, and, (b) lack of knowledge on deworming practices?

The solutions could be:

1. adoption of routine deworming practices
2. awareness creation on
   - hazards of worm infestation
- source of worm infestation
- preventive measures
- advantages of routine deworming

The solutions you give should be feasible and farmers should have the financial means to adopt them. Therefore, it is helpful to divide problems/causes into 3 categories, depending upon resources requirements for their solutions:

Category 1: problems which can be solved by the farmers with their own resources.
Category 2: problems which can be solved only with community co-operation but without involving much outside assistance.
Category 3: problems which can be solved requiring assistance from outside sources.

Examples

Category 1:  **Problem:** Fodder scarcity and low productivity of meat.  
**Solution:** Pasture development in common land

Category 2:  **Problem:** poor health of goats.  
**Solution:** community action for deworming of all village goats.

Category 3:  **Problem:** no access to credit.  
**Solutions:** contact rural finance institutions / Micr credit/ SHG/ Watershed committee

It is important to keep in mind that:

Not all problems can be solved at the same time.
Not all problems can be solved by a farmer family alone.
Not all problems can be solved without outside assistance.
After Identification of a Preferred Solution, We Need To Clearly State our objective to make a realistic plan. In simple terms, planning can be explained as: ‘who’ does ‘what’, ‘when’, ‘where’ and ‘how’. Planning helps field extensionists to move in a desired direction.

In the previous example there were two major causes, and for each cause solutions were identified. Now you have to plan with the farmers which steps to take to carry out these solutions.

An example of planning is illustrated below.

**Table-7 : Example: Action Planning Format**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Organize awareness creation on regular deworming</td>
<td>LI</td>
<td>Next week</td>
<td>In the village</td>
<td>During different village meetings with different groups</td>
</tr>
<tr>
<td>2</td>
<td>Inform ;all the owners and managers to send faecal samples to VD</td>
<td>LI</td>
<td>Once every 3 months</td>
<td>In the village</td>
<td>During a village meeting</td>
</tr>
<tr>
<td>3</td>
<td>Perform faecal samples examination</td>
<td>VAS</td>
<td>-do-</td>
<td>VD/village</td>
<td>Microscopic examination</td>
</tr>
<tr>
<td>4</td>
<td>Prescribe drugs in case of infestation</td>
<td>VAS</td>
<td>-do-</td>
<td>In the village</td>
<td>Prescription</td>
</tr>
<tr>
<td>5</td>
<td>Decide a suitable day with the farmers for deworming of entire goat population</td>
<td>LI</td>
<td>-do-</td>
<td>In the village</td>
<td>In discussion with the people</td>
</tr>
<tr>
<td>6</td>
<td>Organize village level deworming camp</td>
<td>LI</td>
<td>-do-</td>
<td>In the village</td>
<td>With the farmers, deworming through oral/injectable route</td>
</tr>
</tbody>
</table>

So far we have discussed situation analysis, diagnosis and prioritization of problems, identification of solutions and planning. After performing all the above tasks, the next step is implementation of the proposed plan.
When you are involved in implementation of livestock extension activities, there must be some mechanism to ascertain whether progress is being made in the right direction or not.

For example, when you are to carry out demonstrations on UTPS, you need to check regularly:

- whether activities like distribution of paddy straw and urea among the farmers have been completed at the right time and in the right quantities;
- whether the farmers are feeding UTPS to their cattle, and
- whether there is increase in milk production or not as a result of feeding UTPS;
- whether farmers understand the benefit of feeding UTPS, and
- Whether the farmers continue UTPS feeding without external assistance.

Such assessment of progress of ongoing programme of activities is known as monitoring. Basically, monitoring is seeing whether everything goes as nearly as possible according to plan, and that resources are not wasted.

Evaluation is not the same. Evaluation concerns the measurement of results at the end of the programme implementation. It enables the management of a programme to adjust objectives and policies, reorganize organization matters and rearrange resources as necessary.

The process of measuring body temperature and observing reflexes of a sick animal everyday during treatment/ providing first aid can be termed as monitoring.

FAO Training Module

*M.J. Laurie, Management and Organisational Behaviour*
### LESSON PLAN-8

<table>
<thead>
<tr>
<th>Subject:</th>
<th>Small Animal Management, Project Planning &amp; Social Mobilisation</th>
<th>Number of participants:</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topic:</td>
<td>Problem Identification in Sheep, Goat &amp; Pig rearing to enhance income</td>
<td>Duration:</td>
<td>90 Min</td>
</tr>
<tr>
<td>Lesson:</td>
<td>Theory / Practical</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Objectives:**

At the end of the lesson the participants will be able to....

- Analyse the existing practices in small animal management
- Identify the hindering factors for profit maximisation
- Develop one Action Plan for each Species

<table>
<thead>
<tr>
<th>Materials, Tools, Equipment:</th>
<th>Teaching Aids:</th>
</tr>
</thead>
<tbody>
<tr>
<td>(for Practical in the Field, Lab,)</td>
<td>(AV Aids, Information Sheet, Assignment Sheet, Test etc.)</td>
</tr>
<tr>
<td></td>
<td>White Board, Marker, handout, Brown sheet, Permanent marker</td>
</tr>
</tbody>
</table>

**Remarks:** (Notes for changes and adaptations of the lesson plan, for use in future classes)
<table>
<thead>
<tr>
<th>Time</th>
<th>Content: Steps/ Key Points</th>
<th>Methods</th>
<th>Aids</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTRODUCTION</td>
<td>Which are the main problem in Sheep/ Goat/Pig farming Explain objectives</td>
<td>Oral Q.</td>
<td>White Board Marker</td>
</tr>
<tr>
<td>10 Min</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MAIN PART *</td>
<td>What is the ideal situation in Sheep/ Goat/Pig Farming? Health care, Breeding, Feeding, Marketing</td>
<td>Lecture</td>
<td>LCD Projector</td>
</tr>
<tr>
<td>15 Min</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45 Min</td>
<td>Divide participants into 6 groups. &amp; 2 groups will work on one species. Group Work Make Gap analysis in existing and ideal situation Formulate solution strategy Prepare Action Plan</td>
<td>Group discussion</td>
<td>Brown sheet, marker, Adhesive Tape</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Action Plan Format.</td>
</tr>
<tr>
<td></td>
<td>Group will be guided as and when required. Each group will identify one core problem and they will try to identify the related main cause and sub cause of the problem. Keeping in mind the problems which are common, genuine and it is possible to address. The best possible solutions will be identified to overcome the problems and its causes. Thereby ultimate effect should be nearer to ideal situation i.e., profit maximization. Prepare the Action Plan to implement the solutions identified by the group.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Write down the findings in brown sheet ( Problems and Solutions) Write down the Action Plan in the Action Plan Format.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CONCLUDING SESSION</td>
<td>Summary, Review: Student Test Home work</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Action Plan Format

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>What Sub-activity steps</th>
<th>How Means</th>
<th>When</th>
<th>By whom</th>
<th>Expected results</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>A</td>
<td>M</td>
<td>J</td>
</tr>
<tr>
<td></td>
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<td>M</td>
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<td>S</td>
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<tr>
<td>LESSON PLAN-9</td>
<td></td>
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<td></td>
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<tr>
<td>----------------</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Subject:</strong> Small Animal Management, Project Planning &amp; Social Mobilisation</td>
<td><strong>Number of participants:</strong> 20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Topic:</strong> Action Plan on Pig development</td>
<td><strong>Duration:</strong> 90 Min</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Lesson:</strong> Theory / Practical</td>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>

**Objectives:**
At the end of the lesson the participants will be able to...
- Present the group findings on Action Planning
- Receive suggestions for adding relevant points

**Materials, Tools, Equipment:**
(for Practical in the Field, Lab.)

**Teaching Aids:**
(AV Aids, Information Sheet, Assignment Sheet, Test etc.)

White Board, Marker, handout, Brown sheet, Permanent marker

**Remarks:** (Notes for changes and adaptations of the lesson plan, for use in future classes)
<table>
<thead>
<tr>
<th>Time</th>
<th>Content: Steps/ Key Points</th>
<th>Methods</th>
<th>Aids</th>
</tr>
</thead>
<tbody>
<tr>
<td>5Min</td>
<td>INTRODUCTION</td>
<td>Discussion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Adults learn while doing. The group findings will be presented and others will observe the findings of group and suggest for any addition or deletion.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Explain objectives</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 Min</td>
<td>MAIN PART *</td>
<td>Plenary</td>
<td>White Board, Marker</td>
</tr>
<tr>
<td></td>
<td>2 Groups will present their findings. (15 mins for each group)</td>
<td></td>
<td>Brown sheet, marker,</td>
</tr>
<tr>
<td></td>
<td>While presenting they will emphasize on their group feeling not individual idea.</td>
<td></td>
<td>Adhesive Tape,</td>
</tr>
<tr>
<td>20 Min</td>
<td>After presentation of each group other participants will be encouraged to suggest for any points</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 Min</td>
<td>Groups will receive the ideas from other members and if needed it is to be incorporated in the group findings.</td>
<td>Group discussion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CONCLUDING SESSION</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>– Summary, Review: Student</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>– Test</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>– Home work</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**LESSON PLAN-10**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Number of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small Animal Management, Project Planning &amp; Social Mobilisation</td>
<td>20</td>
</tr>
</tbody>
</table>

**Topic**: Care and management of Sheep and Goat

**Lesson**: Theory / Practical

**Objectives**:

At the end of the lesson the students will be able to

- Explain about the advantages of sheep and goat rearing as a livelihood option in the rural area.

- Explore the opportunities & possibilities for sustainable sheep and Goat rearing.

- State different Housing and general management practice of sheep and goat

**Materials, Tools, Equipments**:

- LCD
- Computer / Laptop
- Screen

**Teaching Aids**:

- Handout
- PPT
- BB/WB
- Marker / Duster.

**Remarks**:  

<table>
<thead>
<tr>
<th>Time</th>
<th>Content : Steps / Key points</th>
<th>Methods</th>
<th>Aids</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>INTRODUCTION</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Contribution to state economy/GDP</td>
<td>Brainstorming</td>
<td>WB/Marker.</td>
</tr>
<tr>
<td></td>
<td>MAIN PART</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Feasibility as a livelihood</td>
<td>Lecture</td>
<td>WB</td>
</tr>
<tr>
<td></td>
<td>- Advantages</td>
<td></td>
<td>Marker</td>
</tr>
<tr>
<td></td>
<td>- 2nd day grazer/Close grazer</td>
<td></td>
<td>LCD Projector</td>
</tr>
<tr>
<td></td>
<td>- Disease resistance.</td>
<td></td>
<td>Computer</td>
</tr>
<tr>
<td></td>
<td>- Tribal acceptance.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Better meat acceptance.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Cheap foundation stock</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Different Housing system</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CONCLUDING SESSION</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Less risk involves.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Economical</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Source of livelihood support</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
HANDOUT - 10

Subject: Small Animal Management, Project Planning & Social Mobilisation

Topic Care and management of Sheep and Goat

Objective:

At the end of the lesson the students will be able to:

- Explain about the advantages of sheep and goat rearing as a livelihood option in the rural area.
- Explore the opportunities & possibilities for sustainable sheep and Goat rearing.
- State different Housing and general management practice of sheep and goat

Introduction: -

Increasing the contribution to food production from components of the livestock sector in the future is a most urgent need in all countries. The task is especially compelling in Asia in the face of several demand-led factors which inter alia include population growth, urbanization, income growth, inability of current supplies to match requirements and changing consumer preferences. This situation is further exacerbated by inefficiencies in individual animal production systems and natural resource management to respond to the need for increased supplies of foods of animal origin, as well as promote improved livelihoods and rural growth.

The socio-economic importance of small ruminant owner is widely recognized. However potential contribution is constrained by inefficient use of potentially important breeds, inefficient and inappropriate production systems, poor strategies for improved natural resource management, weak marketing systems, inadequate official support and resource use. These together have resulted in continuing dismal low productivity that does very little to alleviate poverty, subsistence livelihoods and food security especially in rural areas. Their contribution is therefore not commensurate to their value especially in small farm systems.

Goat and sheep production systems

In India, goats and sheep are mostly maintained under extensive system which includes migratory, transhumance, free range, grazing community pastures, stubbles of cropped lands supplemented with crop residues and tree-lopping. Although a number of management systems are in practices varying from region to region they can be conveniently divided in to Extensive, Semi-intensive and Intensive systems.
Extensive System

This system includes migratory, free range, grazing management of goats and sheep. It is most common system not only in India but throughout the Asian region. The system is principally one of low level of productivity emerges from poor nutritional availability. Following are the important features of extensive system of rearing goats and sheep -

- Migratory, free range, grazing management of goats and sheep.
- Most common system in India.
- The system is principally one of low level of productivity emerges from poor nutritional availability.
- The system allows use of land unsuitable for agriculture crop production.
- Involves maximum utilization of family labour.
- Described as Zero Input System as the family labour is the main input.
- Low input - Low return system.
- Minimum safety from predators and inclement weather.

The features of intensive system

- Means complete feeding in stalls. This system (zero grazing system)
- Stocking rates of 16 to 60 animals per hectare are feasible depending upon type of grass, level of fertilization and the presence and absence of legumes and fodder trees.

Semi-intensive System

A kind of compromise between extensive and intensive is referred to as semi intensive system of production. It is a combination of limited free range grazing and supplementation with kitchen wastes, concentrated mixtures, crop residues, stubbles, weeds, cultivated fodders and concentrates etc. Production performance depends on the quantity and quality of grazing / browsing material. This system is advocated for the situation where insufficient grazing is available. The important features of this system are -

- It is a combination of limited free range grazing and supplementation with kitchen wastes, concentrated mixtures, crop residues, stubbles, weeds, cultivated fodders and concentrates etc.
- This system is advocated for the situation where insufficient grazing is available.

The important features of this system are

- Better utilization of limited pasture resources through better management.
- Limited use of agriculture and industrial by-products.
- Relatively lower requirement of labour and capital.
- Use of cheap family labour.
- Risk for protection from predators and inclement weather is reduced.
- Possibility of optimum production through adequate supplementation of diet

**Package of common management practices recommended for Goat / Sheep Farmers**

Modern and well established scientific principles, practices and skills should be used to obtain maximum economic benefits from goat / sheep rearing.

**Housing Management**

The role of shelter is of great significance among various technologies developed for improvement in the productivity of goats and sheep. Unfortunately, due to socio-economic conditions of the farmers the housing facilities available for goats and sheep in our country are suboptimal.

**Deep litter system**

- A small shed with good cross ventilation is enough to keep a small herd.
- Litter height should be at least 6cms.
- Litter material maybe of sawdust, paddy husk and groundnut shell.
- The litter material has to be turned periodically to remove the foul odour in the pen.
- Litter material should be replaced once in every 2 weeks.
- Each goat requires about 15 sq. ft area.
- care should be taken to reduce the external parasitic infestation.
- An adult goat produces about 0.5 tonne of manure in a year.

**Housing for goats / sheep in rural areas**

House for goats/ sheep must be secure, dry, well ventilated free from parasites, clean, well lighted and facing east west direction. House must be in higher level for easy drainage. House should be able to provide protection form rain, cold, direct sun shine and winds. Comfortable house is one where temperature inside remains between 15°C to 25°C. Three to five goats/ sheep may be kept in one house of 2.1 m in length and 1.5 m in width.

**Housing of goats/ sheep in warm and humid climate (Slatted floor houses)**

For a warm and humid climate a raised level house is suitable. It is made of bamboo rails and has no side walls. The floor made of bamboo is raised by about 1 m off the ground so that excreta and urine may fall through gaps in the floor. For a warm and humid climate a raised level house is suitable. The ideal width of the shed is 3 to 3.5 m with a manger of 40-50 cm wide running through the centre. Goats are tied on either side with a floor space of 1.0 m² per adult goat. Bucks/ Rams must be housed separately from the milking goats / sheep and separate sheds for pregnant doe / ewe, kids/lambs and sick animal be constructed.
Floor space requirement of goats and sheep

<table>
<thead>
<tr>
<th>Age/Category of animals</th>
<th>Floor space requirement per goat/sheep(m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Upto 3 months age</td>
<td>0.20 - 0.30</td>
</tr>
<tr>
<td>2. 3 months to 9 months age</td>
<td>0.60 - 0.75</td>
</tr>
<tr>
<td>3. 9-12 months age</td>
<td>0.75 - 1.00</td>
</tr>
<tr>
<td>4. Adult goats</td>
<td>1.00</td>
</tr>
<tr>
<td>5. Pregnant and Lactating does/ewes</td>
<td>1.50</td>
</tr>
<tr>
<td>6. Breeding buck / Ram</td>
<td>1.50 - 2.00</td>
</tr>
</tbody>
</table>

**Layout with details of building required for a 50 Ewe/Doe Farm**

**Table – 8: Floor Space requirement in M²**

<table>
<thead>
<tr>
<th></th>
<th>Area in M²</th>
<th>Max. No. of Animals per Pen</th>
<th>Ht. of Shed at Eaves</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lambs/Kids</td>
<td>0.4</td>
<td>-</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2.2 m in heavy rainfall area, 3m in dry areas</td>
</tr>
<tr>
<td>Ram/Buck</td>
<td>3.4</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Milch Doe/ewe</td>
<td>1.4 x 1.2</td>
<td>-</td>
<td>1 Stall for each</td>
</tr>
<tr>
<td>Ewe/Doe</td>
<td>1</td>
<td>-</td>
<td>60</td>
</tr>
</tbody>
</table>

In case of milch goat farm, the milch doe stall can be raised in place of wool store & shearing room.
Table-9: Total Manger space required.

<table>
<thead>
<tr>
<th></th>
<th>Total manger length in a pen for 100 animals</th>
<th>Water length in a pen for 100 animals</th>
<th>Width of manger /Water trough</th>
<th>Depth of manger /Water trough</th>
<th>Ht. of inner wall of manger /Water trough</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult Sheep &amp; Goats (cm)</td>
<td>40-50</td>
<td>4000-5000</td>
<td>400-500</td>
<td>50</td>
<td>30</td>
</tr>
<tr>
<td>Lambs &amp; Kids (cm)</td>
<td>30-35</td>
<td>3000-3500</td>
<td>300-500</td>
<td>50</td>
<td>20</td>
</tr>
</tbody>
</table>

Layout of a Manger

![Layout of a Manger](image)

Care and Management of kids/Lambs
1. Remove the mucus from the body of the newly born kids/lambs and rub the body gently with the help of clean and soft cloth specially kept for this purpose.
2. Feed colostrum as early as possible preferably within half an hour from birth. The rate of absorption of antibodies will be lowered down as the time passes.
3. Quantity of colostrum to be fed daily should be equivalent to 1/10th of their body weight.
4. Colostrum is the only source to develop immunity in the body. It provides energy to the newborn kids/lambs and prevent them environmental changes.
5. Tightly tied the navel cord with the thread at about 4 cm from the body and then cut with the sterilized scissors or blade and treat with tincture iodine.
6. After birth place the kids/lambs in individual kidding/lambing pens.
7. Do not forget to provide bedding in the individual pens.
8. About for a week keep kids/lambs along with their dams to establish affinity between them.
9. Record the birth weight and give identification mark.
10. Under group management, keeping horned animals is a nuisance. Therefore horn buds in kids/lambs must be cauterized by use of KOH stick at one week age.
11. All male kids except those to be kept for breeding purposes in future must be castrated by Burdizzo’s Castrator at an age of 2 to 4 weeks.
12. During winters take extra precaution to prevent from cold.
13. Avoid overfeeding. It is more harmful than underfeeding.
14. For grazing allow young stock separately from adults to prevent parasitic infestation.

**Care and Management of Pregnant Does / Ewes**

1. Ensure optimum feeding during last about 45 days of pregnancy.
2. Avoid grazing large distances and on undulated surface.
3. Provide green fodder in sufficient quantity.
4. Additional feeding of concentrate mixture @300 g per day is suggested to meet the increased nutrients requirement.
5. Stop grazing about a week prior to kidding/lambing. This will avoid the chances of kidding/lambing not attended properly.
6. Maintain pregnant does/ewes in small groups and separately from other stock so as to ensure their proper care and feeding.
7. Provide sufficient space in the sheds.

**Care and Management of Lactating Does/ewes**

1. Ensure optimum feeding to take care of increased nutrients requirement.
2. Additional quantity of concentrate mixture @ 400 g per kg milk production is recommended to take care of lactation requirement of the does/ewes.
3. Provide green fodder in sufficient quantity.
4. Allow about 8-10 hours grazing under extensive system of production.
5. Udder should not be exposed to cold surface. This may be ensured by providing bedding on the floor of the shed.
6. Provide optimum floor space @ 1.5 m² covered area.
7. Use udder bags for extra large udders.
8. Avoid grazing in thorny area so as to prevent udder injuries.
9. Clean the udder properly before milking.
10. Maintain hygiene and sanitary conditions in the sheds.
Care and Management of Bucks/Rams

1. Breeding males should not be tethered. They should be housed separately to have enough access for movement and exercise.
2. Individual housing particularly during breeding season will avoid chances of fighting, mounting over each other and provide opportunity to devote more time on feeding and rest which is essential for them.
3. Enough exercise for breeding male is necessary so that they remain active and do not become sluggish.
4. During breeding season additional production ration should be provided. Additional concentrate mixture @ 300-400 g/head/day is recommended to meet their production requirement.
5. Hooves should not be allowed to overgrow. Grooming/Brushing makes them active.
6. Availability of ample green fodder and minerals in the diet should be ensured.

References:-


Verma, D.N. (1999). A textbook of livestock production management
**LESSON PLAN-11**

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**Objectives :**

At the end of the lesson the students will be able to

- Explain the symptoms of various diseases of sheep & goat.

- State how to collect, preserve and dispatch the samples.

- State the steps to prevent out-break of diseases.

- Explain the vaccination schedule.

**Materials, Tools, Equipment :**

- LCD
- Computer / Laptop
- Screen

**Teaching Aids :**

- Handout
- PPT
- BB/WB
- Marker / Duster.

**Remarks :**
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HANDOUT - 11

Subject: Small Animal Management, Project Planning & Social Mobilisation

Topic: Common Diseases of Sheep and Goat and their prevention

Objective:
At the end of the lesson the students will be able to:

- Explain the symptoms of various diseases of sheep & goat.
- State how to collect, preserve and dispatch the samples.
- State the steps to prevent outbreak of diseases.
- Explain the vaccination schedule.

Introduction:
In Orissa a few important diseases are occurring in goat which needs quick attention. Care should be taken to prevent the occurrence & spread of such diseases. Since most of the farmers rearing sheep and goat are poor and deficient in requisite knowledge on good management practices for which mortality remains high. They are reared in herd & flock. Most of the dreadful diseases spread very rapidly in epidemic form causing lots of economic loss to the owner. So it is very important to learn about common diseases affecting to sheep and goat of Orissa so that early diagnosis for control of dreadful diseases is possible to minimize the death so that loss can be minimized. Early diagnosis of sick animals is necessary for isolation from the herd as well as preventive vaccination should be practiced to minimize the occurrences and spreading of diseases.

The diseases of sheep and goat are classified as per the following important clinical findings.

a. Characterized with diarrhea
   1. Enterotoxaemia:
   2. Gastro-intestinal Nematodiasis
   3. Paramphistomiasis
   4. PPR
   5. E.coli infection (Colibacilosis)
   6. Coccidiosis

b. Characterized with skin lesions
   1. Contagious eczema
   2. Goat Pox/Sheep Pox
   3. Mange
   4. Foot rot
c. Diseases characterized with respiratory distress
   1. Haemorrhagic septicemia
   2. Myco plasma infection
   3. Chlamydiiosis
   4. CCPP
   5. HCN poisioning

d. Diseases characterized with nervous disorders
   1. Cerebro spinal nematodiasis (Kumri)
   2. GID
   3. Maedi/visna
   4. Trypanosomiasis

e. Diseases characterized with aversion.
   1. Brucellosis
   2. Myco plasmosis
   3. Chlamydiiosis

f. Diseased characterized by Metabolic disorders
   1. Pregnancy Toxemia
   2. Hypo calcaemia
   3. Cerebro- cortical necrosis

The common contagious diseases can be classified broadly into 3 types.
1. Viral Diseases.
2. Bacterial diseases.
3. Mycoplasma/ clamidia & ricketsial disease

**VIRAL DISEASES**

**Food and Mouth Diseases**

FMD occur in mild form in goats. Kids are more susceptible and mortality rate in kids may be very high. Mortality in adult goat is usually low but morbidity rate is high. Economic loss due to high mortality in young kids and serious reduction in production resulting from agalactia abortion and decrease yield of meat.
Aetiology – The virus responsible for the disease is a picorna virus. In India FMD out break due to O.A. & Asia -1’ are known to occur but type ‘O’ is more prevalent in sheep and goat. Large difference in the susceptibility is seen in sheep and goats.

The virus can be carried by wind to distant places. Movement of animals and people between herds can transmit the disease.

Pathogenesis:

- After infection, initial multiplication occurs at the site of entry resulting in the formation of primary vesicles.
- Viraemia then develops.
- Then followed by spread of the virus to target tissues where further replication occurs resulting in a large number of secondary vesicles.
- The FMD virus is epitheliotropic and the mucus membranes and the skin are the main target organs. Damage to the mucous membranes or skin facilitates penetration of the virus.

Symptom-

Incubation period varies from 2-7 days. In outbreak symptoms like pyrexia, nasal discharge, salivation and lameness is seen. Abortion in goats may occur at various stages of gestation. Mouth lesions are more commonly seen in goats which occur as vesicles on the lips, cheeks, gums, dental pads, tongue and palate. Foot lesion occur in the form of vesicles and ulcers on inter-digital cleft, coronary band and heel bulbs. Rashes on teats and udder may be seen also.

Immunity develops after recovery but animals may be infected with other serotypes or subtypes.

Diagnosis-

- From clinical Symptoms and lesions
- In live animals, the virus can be demonstrated in vesicular fluid, epithelial tissues from the edge of ruptured vesicles, pharyngeal and oesophageal secretions, blood collected in anticoagulant.

Send material to laboratory for confirmation. In dead animals, the virus can be isolated from lymph nodes, thyroids, and heart. Samples should be frozen or kept in glycerol buffer (pH 7.6) during transit to the laboratory.

The serological tests used for the diagnosis of the disease include ELISA using Monoclonal Antibody, complement fixation, virus neutralisation.
Treatment-Cleaning with potash 0.001%. Boroglycerine, antibiotic oint./fly repellant on foot. Antibiotic injection 3-5 days.

Control:
- Strict control on movement of animals
- Vaccination of animals is the main method of control of the disease in endemic areas. Restriction entry of animals and animal products from endemic areas has been used to prevent entry of the disease in disease-free countries.
- If an outbreak occurs strict quarantine measures should be instituted and accompanied with vaccination of animals at risk.

Contagious Ecthyma

Contagious Ecthyma (CE), also known as orf, is the most commonly encountered skin disease in sheep and goats. Every breed and age is susceptible, although young animals are more easily infected. Disease is characterised by pustular and scabby lesions on the muzzle, commissures of the lips and nostrils.

The contagious ecthyma virus cannot penetrate the intact skin, hence abrasions of the skin caused by spiky plants, hypodermic needles and surgical operations facilitate the penetration of the virus.

Pathogenesis:
- Initial multiplication of the virus occurs at the site of primary infection.
- Viraemia develops and is followed by subsequent localisation of the virus in the epithelial cells of the Malphigian layer of epidermis of the target organs especially the head, extremities and udder.
- Cells of the genital tract, lungs and liver can also be infected.
- The cytopathic effects of the virus in the infected cells include the development of papules, vesicles, pustules and scabs.

Clinical Symptoms:
- Contagious ecthyma is characterised initially by appearance of erythema which later develop into papules and pustules. When the pustules rupture, the pus forms a thick layer of grey crust and later on result in discrete and thick scabs which are crumbly but adherent to the underlying tissues.
Lesions usually begin at the oral commissures and then spread to the lips, muzzle, nostrils, ears and sometimes to the buccal and nasal mucosae.

Lesions may also occur on the coronet, interdigital cleft, skin of the udder and teats, vulva, preputial orifice, perineal area, thighs and axillae. Adjoining scabs coalesce and form continuous plaques.

Spontaneous recovery occurs in 2-3 weeks. Lesions along the alimentary tract interfere with feeding and result in considerable weight loss and emaciation.

**Pathological Lesions:**

- At gross pathology, contagious ecthyma is characterised scabby lesions on the affected areas and in malignant cases there are ulcerative lesions in the nasal cavity, trachea, oesophagus, abomasum and small intestine.
- Inflammation and oedema of the affected dermis is evident in histopathological sections.

**Treatment:**

If infected animals are kept clean, the disease will clear up in one to four weeks without treatment. However, antibiotic treatment may be given to prevent secondary infection. Vaseline and iodine mixed together or 1% gentian violet, boroglycerine, pot. Permanganate, Lugol’s iodine and antibiotic inj. to check secondary infection. Insect repellants may also be applied, but not on the lesions.

**Pastes des Petit Ruminants**

Pastes des petit ruminants or P.P.R. is a acute contagious viral diseases of small ruminants, which resembles like RP Disease was first recognised in West Africa in 1956, in India in 1994 and in Orissa in 1997 (Nayak et al.). PPR virus belongs to family Paramyxviridae, genus-Morbillivirus. Incubation period is 4-10 days. The 1st stage of the disease is a period of 5-7 days in which there is high fever 40.5-41.5°C.

**Clinical Symptoms:**

- The lining of the mouth is changed in appearance, it becomes pale and coated with dying cells.
- Gentle rubbing across the gum and palate with a finger may yield a foul-smelling material containing of epithelial tissue.
- The lips tend to swell and crack and become covered with scabs.
- A characteristic foul smell from the mouth.
- Affected animals resist attempts to open their mouths because of the pain.
- Diarrhoea commonly appears about two to three days after the onset of fever.

In later stages, the formation of small nodular lesions in the skin on the outside of the lips around the muzzle is seen. Pregnant animals may abort, Signs of pneumonia, Dehydrated with sunken eyeballs is seen. Death often follows within seven to ten days.

**Pathogenesis:**
- Penetrate retropharyngeal mucosa
- Limited replication
- Viraemia occurs
- To alimentary, respiratory and lymphoid system
- Massive replication
- Clinical viraemia
- Necrosis
- Coccidiosis, Pasteurellosis, Colibacilosis may increase the severity of disease
- Death occurs due to dehydration and electrolyte imbalance

**Post Mortem Findings: Ext. Appearance**
- Emaciated
- Hindquarters soiled with soft/watery faecal material
- The eyeballs sunken
- The eyes and nose contain dried-up

**Gross Lesions**
- Abomasum - congested, haemorrhage.
- Small Intestine - filled with greenish yellow fluid congested haemorrhages erosions.
- Ileocaecal region, colon, rectum - “zebra striping.”
- Paeyers patches – prominent and eroded.
- Mesenteric & retropharyngeal lymph nodes – enlarged.

**DIAGNOSIS:** Based on the symptoms. Confirmation by laboratory test. (Elisa)
- Ante mortem material
  - Nasal, ocular, and oral swabs
  - Gum debris
  - Unclotted blood (preserved with EDTA or Heparin )
  - Lymph node biopsies
  - Paired serum
- Post mortem material for Histopath
  - Lymph node (mediastinal & mesenteric)
  - Spleen
  - Lungs - IN 10% NEUTRAL FORMAL SALINE
  - Intestine
  - Ileo-caecal junction

**Treatment:** Antibiotics for 3-5 days. Astringent powder, Cough powder, Paracetamol or meloxicam inj. Vitamin B. complex inj. needs to be given as per dose basing on body weight. Supportive treatment like fluid therapy and mineral mixture may be given.

**Control:** Vaccination 1 ml S/C, immunity 3 years and bio-security measure.

PPR virus killed by most common disinfectants
- Phenols
- Sodium hydroxide 2% for 24 hours
- Ether
- Detergents
- Virus survives for long periods in chilled or frozen tissues

**Goat and Sheep Pox**

Goat pox is an acute to chronic disease of goat characterized by generalized pox lesion throughout the skin and mucus membrane. Other symptoms are persistent fever, lymphadenitis and often a focal viral pneumonia with lesions distributed throughout the lungs. All breed and age groups are affected.

**Pathogenesis**

Following infection the virus is carried through the lymphatic system to the blood circulation. Viraemia develops and is followed by localisation of the virus in the skin and mucous membranes and appearance of pox lesions.

**Symptoms:**
- Incubation period: 4 - 13 days.
- Fever (104-107 F)
- Conjunctivitis
- Depression
- Dyspnea, nasal or ocular discharge
- Secondary bacterial infections are common
- Lymphadenitis
- Focal viral pneumonia
- Resp rate goes upto 90/mint
- Anorexia and emaciation
• Nervous sign
• Swollen muzzle
• Nares and oral mucosa have extensive lesion.
• Disease may lasts 4-6 weeks

Samples to be collected
• SCAB in a sterile container on ice.
• Scab in 50% buffered glycerine.
• Skin lesion in 10% neutral formal saline.


Vaccination: Once a year 1 ml S/C ly to protect the flock

Control: Through routine method of disease control.

**BACTERIAL DISEASES**

**Foot Rot**

It is a hoof infection commonly found in sheep, goats. It affect one or more feet and spread through contaminated pasture, feet, road yard vehicles and other equipments.

**Symptoms:**

The bacteria first invades the interdigital skin following damage to the skin. It rots away the foot of the animal, more specifically the area between the two toes of the affected animal. Swelling and moistness of the skin of interdigital cleft of one or more feet occurs. It is extremely painful. Severe lameness, abscess may develop. In severe cases goat walks on knees, wound in feet become maggoted and hoof may slough off. Systemic involvement causes high rise of temperature, anorexia, emaciation, recumbence and death due to starvation.

Treatment is usually with an antibiotic medication. Remove maggots, apply fly repellants, give antibiotic ointment, antibiotic injection. Feet dip in copper sulphate solution. If the disease is not treated promptly, the whole herd will be contaminated.
Control:
Isolate sick animals, keep pasture clean by avoiding grazing for 14 days. Keep the floor of the shed dry, preventing injury to the feet is the best way to prevent foot rot.

Enterotoxaemia
Enterotoxaemic diseases are acute infectious but non contagious disease. This is a toxaemic of sheep caused by toxin produced by Clostridium perfringens type D in the intestines and it is characterised by diarrhoea, paralysis, convulsions or sudden death. Goats are less commonly affected.

Predisposing factors are grazing on lush pasture / young cereal crop, heavy grain feeding, heavy milk feeding ,change of ration from roughage to conc. Stasis of alimentary tract,heavy worm or coccidial infection.

Pathogenesis:
• *C. perfringens* type D organisms are abundant in the ileum and less so in other parts of the small intestine.
• Sudden change from low to high energy and especially starchy diets favours rapid multiplication of the *C. perfringens* type D which produces an epsilon toxin.
• The toxin is endotheliotropic and binds to the endothelial cells causing damage.
• Damage to the capillary endothelium results in increased permeability of the intestinal mucosa and this facilitate further absorption of the epsilon and other toxins.
• The toxin also causes capillary damage in other tissues such as kidneys, lungs and the brain resulting in oedema.
• Extracellular oedema in the brain is associated with nervous signs.

Symptoms:
• Sudden death is the principal manifestation of the peracute disease in young animals although some of the animals may be dull, depressed and anorexic.
• In acute cases, there is frothy salivation, green or pasty diarrhoea, staggering, recumbency, opisthotonus, colonic convulsions, coma and death
• Colic and bloat may occur.
• Affected adult sheep often lag behind the rest of the flock and show nervous signs as in young animals which include hypersensitivity, staggering gait, ataxia and knuckling of the fetlock.
• Champing of the jaws, blindness, salivation, rapid and shallow respiration, atonic rumen and pasty faeces may also be evident.
• In goats, the acute disease is characterised by diarrhoea or dysentery, abdominal discomfort and convulsions.
• The chronic nervous form of the disease is characterised by aimless wandering, incoordination
**Diagnosis:**
- Gram-positive *C. perfringens* D rods can be demonstrated from smears of the ingesta or intestinal lesions.
- Isolation of the bacteria by culturing a sample of faecal material and demonstration of epsilon toxin in intestinal contents can be highly suggestive of the disease.
- Laboratory test of toxins after death confirm the disease.

**Treatment:**
Difficult but administration of chelating agent to neutralise the toxin. Oxytetracyline and sulphadimidine is effective in treating subacute cases.

**Control:**
Vaccination of all animals, 2 doses at 14 days interval, pregnant to be vaccinated 3 weeks before kidding. Kids to be vaccinate after 3 months of age.

**Haemorrhagic septicaemia**

Haemorrhagic Septicaemia or H.S. is an acute or sub-acute septicaemic disease. The disease occur mainly in rainy season, chilly weathers and low lying areas. Poor ventilation in animal house, inclement weather, Exhaustion during transport, Severe parasitism and Malnutrition in dry season are the predisposing factors.

**Pathogenesis:**
- Main route of transmission is by inhalation of infective aerosal
- Pathogenesis depends upon virulence factor of bacterium, host immunity and severity of predisposing factor

*P. Haemolytica* possesses
1. Adhesive fimbriae-facilitates attachment on the mucosa
2. Secrete proteolytic enzyme-impairs the mucociliary function helps in colonisation
3. A cytotoxin-lysis of resp tract cells.

- The presence of other pathogens in the respiratory tract such as PI-3virus & adenovirus disrupt the phagocytic mechanism and lower the host immunity thus favouring proliferation of pasteurellae.

**Symptoms:**

Incubation period few hours to days. In acute form sudden onset and death occur with out much symptoms in less acute and septicaemic form, high temp, dyspnoea with swelling of neck throat, and head
region with salivation lacrimation, nasal discharge, colic pain, diarrhoea, death occur in 12-48 hours. In pneumonic form marked respiratory distress, pyrexia along with mucoid nasal discharge is seen.

**Diagnosis:**
Symptoms and lab test by gram’s stain.

**Treatment:**
Sulphamezathine 150 mg /kg I/V 3 days or Penicillin, Streptopenicillin, Ampicillin, Chloramphenicol, Oxytetracycline, and other antibiotics as per dose and other supportive therapy.

**Control:**
Vaccination twice a year especially before monsoon is a must. Vaccine is not available against P. haemolytica hence needs care in management.

**Anthrax**
Anthrax is a per acute or acute febrile diseases caused by a large, rod shaped gram + ve bacteria known as Bacillus anthracis, grows well in aerobic condition. It is a sporulated organism, produces spore when exposed to air. Spores are very resistant in normal environment. Infection enters the body by ingestion of contaminated food and water, inhalation or through skin. Biting flies may transmit the disease mechanically.

**Pathogenesis:**
The pathogenicity of *B. anthracis* is related to the presence of the antigenic capsule and the ability of the organism to produce a

- leucocidal protein toxin which is
- antiphagocytic,
- increase vascular permeability,
- delays blood clotting and produces capillary thrombosis.
- Increased capillary permeability causes leakage of body fluids into tissues and body cavities causing oedema and haemonchoncentration.
- Oedema of the lungs interferes with pulmonary perfusion leading to hypoxia, respiratory distress and inadequate supply of oxygen to the central nervous system.
- Leakage of body fluid into body tissues also results in decreased serum calcium and increased serum potassium leading to hyperirritability and convulsions which are observed in some animals.
- Presence of the toxin in the circulation causes severe anoxia, hypoglycaemia, alkalosis and shock which terminate into death.
Symptoms:

In per acute form sudden death occurs with bleeding from natural orifices. Acute form is characterised by fever, depression, weakness, bloody discharge from orifices, cyanosis, dyspnoea, and subcutaneous swelling.

Diagnosis:

Examination of blood smear collected from ear tip by methylene blue reagent. No post mortem done on suspected dead body.

Treatment:

Penicillin, Oxytetracycline, Chloramphenicol, or any other suitable antibiotics. Anti anthrax serum 50-100 ml S/c or I/V daily if available.

Control:

Careful disposal of dead body, bedding material, contaminated soil etc. Strict quarantine and other biosecurity measures.

General measures for control of diseases

- Segregation of animals.
- Proper treatment of affected animals
- Vaccination of healthy animals
- Change of pastures
- Disinfection of sick animal shed
- Burn or bury dead animals
- Quarantine
- Use foot bath, personal hygiene disposal of litter material and approved sanitation measures
- Adopt bio-security measures by restricting and controlling movements of people, vehicles and equipment into areas where your sheep or goats are kept cleaning and disinfecting equipment, vehicles, protective clothing and footwear before and after contact with farm animals.
## LESSON PLAN-12

**Subject :** Small Animal Management, Project Planning & Social Mobilisation  
**Number of Students :** 20  
**Duration :** 90min

**Topic :** Parasitic Infestation in Sheep and Goat and their remedy.  
**Lesson :** Theory / Practical

### Objectives:
At the end of the lesson the students will be able to

- Explain the symptoms of various parasitic infestation in sheep & goat.
- State the steps to control parasitic infestation
- Explain the routine deworming procedure.
- Describe the diagnosis and treatment of parasitic diseases.
- Explain the tips of pasture management to prevent infestation.

### Materials, Tools, Equipments:
- LCD
- Computer / Laptop
- Screen

### Teaching Aids:
- Handout
- PPT
- BB/WB
- Marker / Duster.

### Remarks:
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Subject: Small Animal Management, Project Planning & Social Mobilisation

Topic: Parasitic infestation in Sheep and Goat and their remedy

Objective:
At the end of the lesson the students will be able to:

- Explain the symptoms of various parasitic infestation in sheep & goat.
- State the steps to control parasitic infestation
- Explain the routine deworming procedure.
- Describe the diagnosis and treatment of parasitic diseases.
- Explain the tips of pasture management to prevent infestation.

Introduction:
Livestock sector provides economic and nutritional security along with social status to poor, marginal and small farmers. Animal diseases are crucial constraints in profitable livestock production. The animals of poor people are particularly vulnerable to diseases because of the expense, absence or inadequate animal-health and production inputs. Globally, parasitic diseases continue to be a major constraint for profitable livestock production. Economically major consequences to parasitic infections/infestations include increased mortality and reduction in live weight gain (10-15%), wool yield (30-40%) and quality, fertility and milk production (10-15%), rejection of carcasses or organs for human consumption, predisposing to other diseases (Singh and Swarnakar, 2007). Diseases due to parasites are rarely associated with high mortality but are repeatedly identified by small-animal owners, particularly small ruminant producers, as constraints to animals reaching their full production potential. These effects are more severe in tropical countries like India.

In Orissa majority of the small ruminant and pig populations are owned by farmers belonging to lower economic status. Continuous economic loss incurred by them due to parasitic infestation/infection, though has not been quantified systematically, could be in terms of crores of rupees. In absence of effective antiparasitic vaccines, use of different anthelmintics has been the only method of control of parasites in animals. But, repeated and indiscriminate use of anthelmintics has resulted in emergence of anthelmintic resistant strains of different parasites. Since the availability of antiparasitic vaccines at affordable price is still far from reality and development of new anthelmintic molecule requires lot of
mony and time; the only way out to minimise loss caused due to parasites is integrated control measures which include proper diagnosis and clinical assessment, judicious selection of antiparasitic drugs and their proper dosing at the most appropriate time.

Sheep, goats and pigs are infested/infected with a wide range of both ecto and endo parasites. All of them are not equally pathogenic. This topic will only emphasize on parasites those are pathogenic and cause considerable economic loss in these animals.

Ectoparasites such as ticks, mites, lice, fleas and flies are able to disturb the normal physiology of animals due to their persistent irritating and annoying behaviour for which the animals fail to feed or sleep properly. This can cause considerable loss in weight gain and production. ticks, mites, blow flies, biting flies, lice etc. cause damage to the hide. Some ticks are responsible for causing serious conditions like tick paralysis and tick toxicosis. More important is that ticks and some biting flies act as vectors in transmission of some important viral, bacterial, protozoan and rickettsial diseases. These vector born diseases can some time occur in form of outbreaks resulting in high morbidity and mortality. now a days many safe and potent ectoparasiticidals are available which can be applied at the proper does as per the safty instructions and precautions of the manufacturers.

Endoparasites or internal parasites include both helminthes and protozoa. Helminthes are platyhelminthes (flukes and tapeworms), nemato-helminthes (round worms) and acanthocephalan (thornyheaded worms). Protozoa may be gastrointestinal protozoa (most important are coccidia), blood protozoa (Trypanosoma evansi, Babesia and Theileria etc) and tissue protozoa (Sarcocystis and Toxoplasma). Among the different internal parasite Gastrointestinal parasites in general and gastrointestinal nematodes in particular are mainly responsible for morbidity and mortality in small animals. Besides that lung worms in sheep, goats and pigs and kidney worm in pigs are also considered as serious pathogens. Among protozoa, coccidian are problematic for kids and lambs that can cause heavy mortality.

Table-10: Common Endo- parasites infecting small ruminants and pigs

<table>
<thead>
<tr>
<th>PARASITES</th>
<th>SHEEP AND GOATS</th>
<th>PIGS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Flukes</strong></td>
<td>Fasciola gigantica (liver fluke)</td>
<td>Fasciolopsis buski (intestinal fluke)</td>
</tr>
<tr>
<td></td>
<td>Amphistomes (rumen flukes)</td>
<td>Amphistomes in large intestine.</td>
</tr>
<tr>
<td></td>
<td>Schstosoma Spp. (blood flukes)</td>
<td></td>
</tr>
<tr>
<td><strong>Tape worms</strong></td>
<td>Moniezia spp.</td>
<td>Cysticercus cellulosae (metacestode of Taenia solium)</td>
</tr>
<tr>
<td></td>
<td>Avitllina spp.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stilesia spp.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cysticercus tenuicollis.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cysticercus ovis, Coenurus cerebralis and hydatid cysts. (metacstode stages of different canine tape worms)</td>
<td></td>
</tr>
<tr>
<td><strong>Nematodes (round worms)</strong></td>
<td>Stomach worms:</td>
<td>Large intestinal-roundworm:</td>
</tr>
<tr>
<td></td>
<td>Haemonchus contortus</td>
<td>Ascaris suum</td>
</tr>
<tr>
<td></td>
<td>Trichostrongylus Spp</td>
<td>Kidney worm:</td>
</tr>
<tr>
<td></td>
<td>Mecistcirrus digitatus</td>
<td></td>
</tr>
</tbody>
</table>
Ostertagia ostertagi
Ostertagia circumcincta
**Nodular worms:**
Oesophagostomum spp.
**Hook worms:**
Bunostomum Spp.
Gaigeria Spp.
**Other intestinal worms:**
Strongyloides papillosus
Trichuris ovis (Whip worm)
**Lung worms:**
Protostrongylus rufescens
Muellerius capillaris

<table>
<thead>
<tr>
<th>GI protozoa</th>
<th>Various Eimeria Spp. Of coccidia</th>
<th>Several spp. of Eimerian coccidia, Balantidium coli</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haemoproteozoa</td>
<td>Trypanosoma evansi, Theileria hirici, Babesia motasi, Babesia ovis, Babesia taylori and Babesia foliata</td>
<td>Trypanosoma evansi, Babesia trautmanni</td>
</tr>
<tr>
<td>Tissue protozoa</td>
<td>Toxoplasma gondii, Sarcocystis Spp</td>
<td>Toxoplasma gondii, Sarcocystis Spp</td>
</tr>
<tr>
<td>Thorny headed worm</td>
<td>Macrocanthorynchus hirudinaceous</td>
<td></td>
</tr>
</tbody>
</table>

Among the above fluke parasites *Fasciola gigantica* and different species of amphistomes are very very pathogenic in nature. They have indirect life cycle involving snails as intermediate hosts. Metacercariae, the infective stage are found attached to grass and other herbage found near water bodies. Both mature and immature stages of *Fasciola* are pathogenic. But acute form of disease can only be caused due to migration of large number of young flukes through the liver parenchyma which cause extensive mechanical damage with haemorrhage. Other clinical signs and symptoms are distended abdomen, ascitis, anaemia, stiff gait, loss of appetite, black scour, and bottle jaw condition. On PM examination liver shows clay pipe or pipe stem condition.

Mature amphistomes are not pathogenic except causing denudation of ruminal papillae. But, immature amphistomes are serious in nature and occur embedded in the mucosa of duodenum and posterior part of abomasums. They cause severe type of shooting diarrhea which produce a characteristic foul smell. There is dehydration, loss of plasma protein. Death may occur in most of the unattended cases. The common symptoms are

![Fig -9](http://www.cdc.gov/parasites/)

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diarrhea, anorexia and oedema.

Schistosome spp. Causing hepatointestinal schistosomosis (visceral schistosomosis) are also important from pathogenic point of view both for sheep and goats and pigs. They cause enteritis, hepatitis resulting in diarrhea, inappetence and loss of body weight.

Diagnosis: in field condition the characteristic clinical signs and symptoms are important to suspect fluke disease. Faecal samples can be examined to find the eggs of the concerned fluke. But, in acute cases which are caused due to immature flukes no eggs can be found in the F/S examination. In that case clinical signs and symptoms, history, topography and climatic conditions should be analysed. Schistosome eggs contain well developed miracidium (1st stage larva) when laid. These larvae usually hatch as soon as they come in contact with water while preparing faecal smear. So, schistosome eggs are not usually detected during routine examination of faecal samples. Therefore schistosomosis though prevalent everywhere, has not received due attention from the veterinarians. Hence faecal sample should be diluted with 5% formalin to make smear for detection of typical spinosed schistosom eggs.

Oxyclozanide, rafoxanide, trichlabendazole, benzimidazoles in higher doses are the recommended drugs against fluke infections.

- Oxyclozanide – 10-15 mg./ Kg. b. wt
- Rafoxanide – 7.5 mg. / Kg. b. wt
- Trichlabendazole – 10 mg/ Kg. b. wt
- Nitroxynil – 10 mg/ Kg. b. wt
- Closantel – 10 – 15 mg/ Kg. b. wt

Adult tape worms are not usually considered as pathogenic. They may cause mild type of enteritis and diarrhea. When occur in large number, because of their large size they may cause obstruction to the lumen of intestine. But, tape worms must be treated and eliminated from the animals body because they deplete a major part of host nutrition there by causing weight loss. The eggs of tape worms are not passed freely with the faeces. It is the gravid segments which are visible to the naked eye, containing eggs, come out with the faeces. So a veterinary clinician should search for the gravid segments in the faeces instead of eggs. A drug having scolidal property should be chosen for the treatment of tape worm which can ensure complete elimination of the worm. Praziquantel (10- 15 mg/K.B.wt) and Niclosamide(100 mg./k.b.wt) are the drugs of choice.

Among the nematodes, GI nematodes particularly Strongyloides spp., hook worms, nodular worms and whip worms are important which can cause significant economic loss. Their occurrence is very common in these small ruminants. Mixed infection is a rule rather than exception. *Ascaris suum* is a serious pathogen and an important causative factor for piglet mortality, stunted growth and emaciation.
Gastro-intestinal parasites of ruminants which are responsible for causing serious disease conditions having high economic impact on ruminant livestock production particularly in small ruminants belong to the family Trichostrongylidae involving the genera Haemonchus, Trichostrongylus, Mecistocirrus, Oesophagostomum, oestertagia, Cooperia and Nematodirus besides hook worms like Bunostomum spp. Haemonchus contortus and Mecistocirrus digitatus cause haemorrhage through wounds in abomasums.

The blood sucking capacity of a Haemonchus parasite has been estimated to be 0.05 ml/day. Oestertagia spp. cause functional destruction of gastric glands in abomasum where as Trichostrongylus and Nematodirus spp. of worms are responsible for causing villous atrophy. Nodule formation in the small intestine and Ulceration with haemorrhages in the large intestine are caused by Oesophagostomum and Chabertia spp. of worms respectively.

Strongyloides infection in small ruminants and pigs can also cause significant damage. Due to parthenogenetic nature of the females and facultative nature of life cycle large number of infective larvae are always present in the environment.

**Anorexia and reduced feed intake.**

- Loss of blood and plasma protein into the GIT.
- Alteration in protein metabolism (Hypoalbuminaemia)
- Depressed level of mineral metabolism, so reduced bone growth.
- Depressed activity of some intestinal enzymes.
- Malabsorption.
- Diarrhea.
- All these factors contribute towards depressed weight gain, poor growth, reduced milk production and muscular atrophy.

Diagnosis can be done from clinical signs and symptoms and by finding the eggs/larvae in the faeces by adopting routine sedimentation and floatation techniques.

**Treatment of GI Nematodosis:**

- Thiabendazole-65 mg/kg.b.wt
- Parbendazole-20 mg/kg.b.wt
- Mebendazole-15 mg/kg.b.wt
- Cambendazole-25 mg/kg.b.wt
- Fenbendazole-7.5 mg/kg.b.wt
- Oxfendazole-5 mg/kg.b.wt
- Closantel-10-15 mg/kg.b.wt (effective against G.I. nematode and ectoparasites like ticks, lice etc)
- Albenbendazole-7.5 mg/kg.b.wt
- Febantal- 7.5 mg/kg.b.wt
- Thiophenate - 50-100 mg/kg.b.wt
- Levamisole - 7.5 mg/kg.b.wt S/C/oraly
- Morantel tarttrate -10 mg/kg.b.wt

**Avermectins:**

Ivermectin and Doramectin for endo and ectoparasites. Highly effective in all types of G.I. nematoda. 200 microgram.kg.b.wt or 1ml/50 kg.

**Control:**

- Most of the above nematodes have direct life cycle. L3 larvae are the infective stage which are found plenty in the pasture and soil. Infective eggs (containing L2 larva) of Ascaris suum are very resistant to environmental hazards, thus available in hygienic condition in large number to cause infection in piglets and adults. Thus control measures should include managemental practices, hygiene and sanitation, pasture management. Use of anthelmints have so far been the only method which is followed widely in field conditions.

- However, since the early 1960’s there have been only three major classes of broad-spectrum anthelmintics commercially released for the control of nematode parasites of ruminant livestock, namely: the benzimidazoles / probenzimidazoles (BZs), the tetrahydropyrimidines / 4 imidazothiazoles (most important drug being levamisole: LEV), and the macrocyclic lactones (MLs), or avermectins/mylbemycins.

The dependence on anthelmintics has several disadvantages including

i) development of anthelmintic resistant parasitic strain
ii) consumers concern regarding residues in food products and in the environment
iii) the negative effects of preventive measures on the development of natural immunity against worms.

**Control mainly directed towards**

- Management of pasture and animal husbandry.
- Good habitation and proper drainage of pasture and sewage disposal is essential.
- Provision of well balanced diet.
- Regular strategic treatment of animals.
- Management of pasture land:
  - Infected pasture land should be trenched.
  - Infected animals should not be allowed to graze in non-contaminated pasture.
- Provision of proper drainage.
- Grazing Managements
  - Animal should be allowed to graze after 9 am (between 9 am to 4 pm) because the population of infected larva is decreased during this period.
• Large animals like cattle, buffalo, and equines which are more resistant should be first allowed to graze on pasture followed by small animals.
• Adult animal should be allowed to graze on pasture followed by young animals.
• Pasture collected from infected pasture land should be stocked for a period of 2-3 months during which the infective larva may be destroyed.
• Rotational grazing may be practiced.
• Ploughing or burning of infected pasture.
• Proper disposal of faeces.

**Deworming Schedules:**
In view of the climatic conditions prevailing in our state the following deworming schedules may be followed when mass deworming is desired.

**Sheep & Goats:**
- June-July : Any broad spectrum anthelmintic (must be changed after one year)
- October- November
- January – February

**Pigs:**
- June-July : Any broad spectrum anthelmintic (must be changed after one year)
- October- November
- Ewes and Does should be dewormed before two months and must be dewormed on next day of kidding/lambing with broad spectrum anthelmintic.
- Pregnant sows should be dewormed two weeks before farrowing and again after one month of farrowing.
- Routine deworming should be started after one month of age in sheep and goats. Piglets should be dewormed with piperazine salts after two weeks of age, thrice in three weeks interval.

**Conclusion**

• Endo parasites particularly GI nematodes which have severe detrimental effects on small ruminant livestock production should be controlled efficiently adopting various integrated approaches against wide spread emergence of anthelmintic resistance and to comply with the prevailing stringent international trade laws and global mandate for environmental protection and conservation.

• Till the desired success in the field of immune prophylaxis against parasites has not been achieved and cost effective potent vaccines have not been handed over to the poorest of the poor livestock farmers at an affordable cost alternative methods and efficient anthelmintic management are the only option to control the GI parasites in the ruminant livestock’s to meet the ever increasing global demand for their products and byproducts.

**Reference:**
Sheep goat Diseases of Small Ruminants A Handbook.htm
## LESSON PLAN-13

<table>
<thead>
<tr>
<th>Subject: Small Animal Management, Project Planning and Social Mobilization</th>
<th>Number of Students: 20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration: 90 mts</td>
<td></td>
</tr>
</tbody>
</table>

**Topic**: Breeding practices, genetic up-gradation in sheep, goat and Pig

**Lesson**: Theory / Practical

### Objectives:
At the end of the lesson the students will be able to

- Explain about different breed characteristic of local breed.
- State the system of breeding.
- Explain about the available breeds of sheep in different parts of Orissa.
- Describe about the advantage / Disadvantage
- Explain about the importance of conservation of local indigenous germplasm

### Materials, Tools, Equipments:
- LCD
- Computer / Laptop
- Screen

### Teaching Aids:
- Handout
- PPT
- BB/WB
- Marker / Duster

### Remarks: 
<table>
<thead>
<tr>
<th>Time</th>
<th>Content : Steps / Key points</th>
<th>Methods</th>
<th>Aids</th>
</tr>
</thead>
<tbody>
<tr>
<td>10min</td>
<td>INTRODUCTION :</td>
<td>Discussion</td>
<td>LCD Computer Screen</td>
</tr>
<tr>
<td></td>
<td>What are the breeds of Sheep, goat available in Orissa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10min</td>
<td>MAIN PART :</td>
<td>Discussion</td>
<td>LCD Projector Computer Screen</td>
</tr>
<tr>
<td></td>
<td>Type of breeding</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Selective breeding</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Upgrading</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10min</td>
<td>Breeding policy</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Selection</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Why Selection? Selection Criteria, Selection and Genetic gain, Selection in farmers’ flock, Selection in institutional flocks, Selection in open nucleus flocks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15min</td>
<td>Breeding System</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pure breeding, Out crossing, Inbreeding, Line breeding, Crossbreeding, Grading up</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15min</td>
<td>Conservation of native germplasm</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Different breed to be conserved, method of conservation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Procedure/approach of conservation.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5min</td>
<td>CONCLUDING SESSION :</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Advise for exchange of buck.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Improvement of local breeds through conservation.</td>
<td></td>
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</tr>
</tbody>
</table>
**Breeding practices, genetic up-gradation in sheep, goat and Pig**

**Breeding of sheep & Goat**

The Sheep & Goat resources of Odisha are mainly of meat type. Hence, it is imperative to measure production trait with respect to meat production in order to improve such animals by selective breeding / cross breeding as per the policy of the Govt. of Odisha.

**Meat production traits**

- Body weight at a particular age – 3/6/9/12 months
- Body growth per day – 3 to 6 months or 3 to 9 months of age
- Body size at particular age – 6/12 months
- No. of kid born and survived per adult female/year
- Carcass weight compared to body weight before slaughter

**Phenotype & Genotype**

Phenotype (growth & meat production) is the interaction of Genotype with the environment.

\[ P = G + E \]

P – Phenotype
G – Genotype
E – Environment

Under Odisha condition Sheep & Goat are reared under extensive system. As the growth rates of such animals are slow against feeding of concentrate (without selection) improvement in feeding is likely not to be economical. Environment can not be improved upon with exception of improving immunization against preventable diseases of economic importance and deworming. Further such animals (private good) thrive on public good (common pasture). There is limited quantity of availability of natural biomass. Hence, it is desirable to select such animals which can grow at a faster rate on existing resources. At the same time poor growing animals are to be culled to optimize the use of resources. Especially the Bucks & Rams with poor growth rate should not be allowed to continue in the flock as their progenies are expected to be poor performers. Hence, all the male animals at 6 months of age with poor growth rate are to be castrated.

**Scope for selection**

It depends on the variation of phenotype in a population. More the variation higher is the scope for selection and improvement.
Genetic improvement

It depends on selection intensity, accuracy of selection and variation with respect to generation interval. Generation interval is normally 3 to 3½ years. It can be reduced by improving management and applying appropriate breeding techniques. The main purpose of breeding is to produce individual with superior merit in terms of production, reproduction and overall economics through recombining the genes into more desirable groups.

Creation of database on meat production trait

It is important to record body weight at different age in that locality / flock. Measures of mean, standard deviation, variance, coefficient of variation, standard error, correlation & regression will help to select animals to parent future generation.

Variation & scope for development

Suppose the mean body weight at 12 months of age is 15 kg. The range is 8 to 20 kg. It is decided to select does having body weight above 18 kg to parent the next generation. The selection difference is 3 kg. say the progenies of such female stock do attain body weight of 16.2 kg at 12 months of age. Now it is considered that the additive genetic value of mother is 1.2 kg. The other part of the selection difference i.e. 1.8 kg could be due to a better environment in which the selected group is kept. So the additive genetic value can be attributed to the genetic superiority expressed by the offspring as inherited from the parents. It is called heritability. Heritability for growth is in the range of 0.2 to 0.6. It means it varies between 0 & 1. If it is 0 means all variation is due to difference in environment and 1 means all variation is due to genotype.

Correction factors

While creating the database to compare the phenotype of relatives it is imperative to have some correction factors in order to minimize the effect of the season, parity & liter size.

Applicability for selection of improvement

(a) Farmers having few animals – Less emphasis should be given on genetic improvement to get phenotypic gain. Emphasis on improvement of environment is to be emphasized i.e. feeding, management, housing, deworming & vaccination etc.
(b) Farmers’ having 10 to 15 animals – Identification of a Buck above the herd average is to be identified and allowed to serve not exceeding 2 years to minimize the effect of inbreeding.
(c) Traditional flocks with more than 100 animals - Creation of data base w.r.t. growth rate and body weight at marketing. Selection of parents for the future generation. Field Performance Recording
of progenies, culling of the stock not confirming to standard growth rate and body weight at marketing.

While improving the Bengal type goat, also farmers’ preference for colour must be emphasized. Performance also differs according to the colour of the body coat within Bengal type goat.

Table – 11 Performance trait of Bengal type goat according to body coat colour

<table>
<thead>
<tr>
<th>Trait</th>
<th>White</th>
<th>Brown</th>
<th>Black</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of breedable female</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>No. of kidding over 3 yrs.</td>
<td>48</td>
<td>34</td>
<td>33</td>
</tr>
<tr>
<td>Multiple births (%)</td>
<td>64</td>
<td>70</td>
<td>60</td>
</tr>
<tr>
<td>Single</td>
<td>17</td>
<td>10</td>
<td>13</td>
</tr>
<tr>
<td>Twin</td>
<td>25</td>
<td>20</td>
<td>17</td>
</tr>
<tr>
<td>Triplets</td>
<td>05</td>
<td>03</td>
<td>03</td>
</tr>
<tr>
<td>Quadruplets</td>
<td>01</td>
<td>01</td>
<td>00</td>
</tr>
<tr>
<td>Age at 1st kidding (days)</td>
<td>356</td>
<td>373</td>
<td>384</td>
</tr>
<tr>
<td>Kidding interval (days)</td>
<td>218</td>
<td>225</td>
<td>237</td>
</tr>
<tr>
<td>Body weight in Kg.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At birth</td>
<td>1.12</td>
<td>1.09</td>
<td>0.90</td>
</tr>
<tr>
<td>3 months</td>
<td>6.11</td>
<td>5.64</td>
<td>5.19</td>
</tr>
<tr>
<td>6 months</td>
<td>7.72</td>
<td>8.30</td>
<td>7.86</td>
</tr>
<tr>
<td>9 months</td>
<td>10.43</td>
<td>10.63</td>
<td>11.09</td>
</tr>
<tr>
<td>12 months</td>
<td>13.35</td>
<td>14.49</td>
<td>13.14</td>
</tr>
<tr>
<td>Dressing percentage to live weight</td>
<td>42.80</td>
<td>41.50</td>
<td>47.90</td>
</tr>
<tr>
<td>Adult mortality (%)</td>
<td>00</td>
<td>20</td>
<td>26.67</td>
</tr>
<tr>
<td>Kid mortality (%)</td>
<td>55</td>
<td>65</td>
<td>70</td>
</tr>
</tbody>
</table>

Breeding System

Selection and systems of breeding are the tools available for a breeder or a farmer for improvement of animals, since new genes cannot be created; they can recombine into more desirable groupings. The system of breeding may be involved thorough-

Pure breeding

Pure breeding is the mating of males and females of the same breed. A purebred flock can be managed as a single flock because all ewes and rams are of the same pure breed. The goal of purebred sheep/goat production should be to supply genetics (seed stock) to the commercial sheep/goat industry. Seed stock is marketed as rams or bucks and replacement ewes/does to other seed stock producers or to commercial sheep/goat operations.
Improvements in purebred sheep and goats should be documented through records. The National Sheep Improvement Program (NSIP) collects performance data from purebred producers and provides them with across-flock EPDs. "EPD" is short for "Expected Progeny Difference."

**Out crossing**

Within pure breeding, there are several types of mating systems. Out crossing is the mating of animals of the same breed but which have no closer relationship than at least 4 to 6 generations. Out crossing is the recommended breeding practice for most purebred sheep or goat breeders.

**Inbreeding**

Inbreeding is a system of breeding in which closely related animals are mated. This includes sire to daughter, son to dam, and brother to sister. Technically, inbreeding is defined as the mating of animals more closely related than the average relationship within the breed or population concerned. The primary genetic consequence of inbreeding is to increase the frequency of pairing of similar genes.

Inbreeding is essential to the development of prepotent animals — animals that uniformly "stamp" their characteristics on their progeny. Inbreeding may also be used to uncover genes that produce abnormalities or death — genes that, in outbred herds, are generally present in low frequencies. Inbreeding is suggested for only highly qualified operators who are making an effort to stabilize important traits in a given set of animals. In general, inbreeding results in an overall lowering in performance: vigor, disease resistance, reproductive efficiency, and survivability. It also increases the frequency of abnormalities. For example, the spread of spider lamb disease in black-faced sheep is believed to be the consequence of inbreeding.

**Line breeding**

Line breeding is a system of breeding in which the degree of relationship is less intense than in inbreeding and is usually directed towards keeping the offspring related to some highly prized ancestor. The degree of relationship is not closer than half-brother half-sister matings or cousin matings, etc. Line breeding is a mild form of inbreeding.

**Crossbreeding:**

It has been established that, Jamunapari x Black Bengal will provide the best meat animals. However, Beetal and Barbari cross with Black Bengal also performs satisfactorily.

**Estrus detection and artificial insemination:**

- **Symptoms:**
  - Increase in animal’s activity and attentiveness.

99
• More vocal.
• Walk around with tails raised.
• Edematous and reddened vulva.
• Homosexual mounting.
• Frequency of urination increases.
• Tail wagging.
• Bleating.
• Restlessness.

Frequent Tail wagging is the principal sign of onset of estrus. The signs like tail wagging, bleating, & restlessness tend to appear -60 to + 35 hours relative to onset estrus. However such signs intensify -12 hours to onset of estrus. The duration of estrus is around 30 hours in goat and less in ewe. Goat is a spontaneous ovulator and ovulation occurs 30-60 hours after start of sexual receptivity.

**Artificial insemination:**

It is done with frozen semen 12 hours after onset of estrus. Vaginal insemination has the lowest success rate. Intra uterine insemination i.e. laparoscopic method has the high success rate but not applicable under Indian condition. Thus trans cervical insemination is the option left to us. Though goat resembles cow in estrus behavior and principle of AI can be applied as in case of cow, two insemination in the same cycle is to be avoided as vaginal distention by application of speculum leads to reflex release of oxytocin which may cause cervical and vaginal contraction leading to impaired transport of spermatozoa in the female genetic tract. However one study revealed oxytosin improves semen deposition in trans cervical AI in goats.

**Synchronization of estrus:**

Prostaglandin F$_{2\alpha}$ can be used to synchronize estrus by giving two injections to cyclic goats at 11 days interval. Luteolysis by prostaglandin F$_{2\alpha}$ is not possible when the age of CL is less than 5 days. Synchronization is effective at dose rate of 1.25 mg. to 2.5 mg of dinoprost or 100-150 micro gram of synthetic prostaglandin F$_{2\alpha}$ i.e. cloprostenol. Insemination around 72 hours following application of 2$^{nd}$ dose of prostaglandin ensures good kidding rate.

**Pseudo pregnancy**

It happens rarely in meat type goat. It can be treated with the 100 micro gram of cloprostenol once to evacuate the uterine content.

**Induction of parturition**

Depending on the need parturition can be used by injecting 15-20 mg of dexamethasone or 2 mg of flumethasone. The application of corticosteroid in evening gives better result than in the morning. The parturition is completed by 72 hours and peak is around 36 hours.
**Inter sexuality**

The incidence of inter sexuality is more common in polled goats. Most of the inter sexuals are female like at birth however after attainment of puberty they tend to be masculine. Thus the polled goats are to be called from the breeding flock.

**Breed Complementarity**

**Small Animal Genetic Resources of Orissa and its Conservation**

Orissa has wide varieties of genetic resources in form of sheep and goats. In addition to Black Bengal and Ganjam breeds of goats and Bolangir and Ganjam breeds of sheep of our state, which have been recognized by the FAO & ICAR and registered there are some other unique type of these animals do exist in the State. Some of the identified sheep and goat breed of Orissa are-

**Sheep Breeds**
- Bolangir
- Ganjam
- Kendrapada
- Edka
- Koraput
- Chhotnagpuri

**Goat Breeds**
- Ganjam
- Bengal
- Ghumsari
- Maraguda
- Raighar
- Badavihan

The performance of these sheep and goat resources vary depending upon their genetic potentialities and managerial practices in their breeding tracts. However, the economic performance of these breeds is given below-

**Table – 12: Performance of native goats of Orissa**

<table>
<thead>
<tr>
<th>Breed</th>
<th>Average wt.(Kg)</th>
<th>ASM (m)</th>
<th>Kidding Interval (m)</th>
<th>Prolificacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ganjam</td>
<td>30-35</td>
<td>18-20</td>
<td>12-14</td>
<td>less</td>
</tr>
<tr>
<td>Bengal</td>
<td>20-22</td>
<td>7-8</td>
<td>6-8</td>
<td>High</td>
</tr>
<tr>
<td>Ghumsari</td>
<td>25-30</td>
<td>14-18</td>
<td>10-12</td>
<td>less</td>
</tr>
<tr>
<td>Maraguda</td>
<td>20-25</td>
<td>8-10</td>
<td>6-8</td>
<td>High</td>
</tr>
<tr>
<td>Raighar</td>
<td>22-25</td>
<td>7-8</td>
<td>6-8</td>
<td>High</td>
</tr>
<tr>
<td>Badavihan</td>
<td>24-27</td>
<td>12-15</td>
<td>8-9</td>
<td>Medium</td>
</tr>
</tbody>
</table>

**Table – 13: Performance of native sheep of Orissa**

<table>
<thead>
<tr>
<th>Breed</th>
<th>Average wt.(Kg)</th>
<th>ASM (m)</th>
<th>Lambing Interval (m)</th>
<th>Prolificacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ganjam</td>
<td>30-35</td>
<td>12-15</td>
<td>8-10</td>
<td>less</td>
</tr>
<tr>
<td>Bolangir</td>
<td>22-26</td>
<td>12-15</td>
<td>9-12</td>
<td>less</td>
</tr>
</tbody>
</table>
The small animal genetic resources of our State are undergoing a remarkable change since few years. In the absence of planned efforts to maintain the purebred population indiscriminate breeding within the native stock is still continuing. The traditional method of breed improvement and conservation is very important, though new approaches are emerging to meet the growing challenges of saving the native germplasm from being dilution. These may include keeping of representative population of the breed In Situ or Ex Situ.

Conservation of AnGR

Conservation is the management of genetic resources for human use so that it may yield the greatest sustainable benefits to present generation while maintaining its potential to meet the needs and aspirations of future generations. It is always better to keep the live populations of animals which may go on improving not only in production potentials but also in their adaptation to the changing environment.

The gene resources of our small animals consists of genetic variation within and between the breeds. It has been estimated that the variation between breeds accounts for approximately 50% of the total genetic variation within each species while the variation within each breed accounts for the remaining 50% of the total variation. The dilution of the gene pool thus results in the reduction of variation within the species. The best way to conserve the resources is within their native environment (In Situ). However it will be huge task unless the stake holders and the farmers are not involved themselves.

Breeding Behaviour

For improvement of the stock the common breeding or parturating seasons of the animals must be kept in mind. Though ewes and does come in heat throughout the year, most of the animals show heat during the months of Sept.-Oct. and March-April, the breeding may be restricted to these two seasons to avoid the spread of lambing throughout the year and thus avoiding managemental problems.

Why Selection?

- If a farmer makes a good choice of males, the females they serve will produce fine, better lambs/ kids.
- If the sire is well built, he will produce well-built offspring.
- If the sire is badly developed, he will produce badly developed offspring.
- By making a good choice of males one can quickly improve the flock.
- When a farmer makes a good choice of females, they produce fine offspring, and they have plenty of milk to feed them.
- Ewes or does which have 2 lambs/ kids in the first litter almost always have 2 in other litters.
The good qualities of the breeding animals are often passed on to their offspring.

So it is very important to make a good choice of breeding animals.

A farmer who makes a good choice of seeds gets better harvests.

A farmer who makes a good choice of breeding animals gets a better flock.

Moreover the indigenous breeds without affecting their purity can be improved through selection. The selection particularly of rams or bucks should be made on the basis of wool/ hair quality and body weight as these traits have reasonably high heritability.

While selecting the stock, emphasis must be laid on phenotypic and genotypic makeup and other important traits. Normally traits like fertility, prolificacy, weight at birth, weight at weaning, age at sexual maturity, weight at sexual maturity, body conformation, genetic defects, feed conversion ability etc. are to be considered while the animals are selected. Again the number of breeding stock that is to be maintained depends upon the infrastructure, capital strength of the rearer and availability of the feed resources. The breeding stock must have a male and female ratio and there should opportunity for future expansion.

Selection Criteria

Selection criteria will depend upon the phenotypic and genotypic variances among the important characters, their economic value and source of information. Attempts have been made to develop selection criteria for improving production of various economic traits largely on Indian experience. For improving meat production in small animals body weight at six month age will be feasible to bring relative genetic progress in meat production, weight gain and carcass yield. Like wise for improving apparel wool production selection based on first six monthly greasy fleece weight and average fiber diameter will allow maximum genetic improvement in wool production and quality.

Selection and Genetic gain

Genetic gain through selection is a function of accuracy, intensity of selection and generation interval. Accuracy can be maximized by identifying indices which have highest correlation with the genetic worth / breeding value which can not exceed 1.0. Intensity of selection can be raised by choosing highly deviant animals from the population mean. Such animals are superior to the population and maximizing the use of such animals along with reducing generation interval may allow faster genetic gain.

Selection in farmers’ flock

A large number of farmers’ flocks are put under recording performance and the superior flocks are identified. This stock can be used for producing genetically superior breeding males which could subsequently be distributed to the flocks inferior to the average of population. Basing on the requirement of characters of importance the males and females are selected are allowed to produce male progenies. The male progenies so produced by the elite males and females are reared in the farmers’ flock and later, made available to replace the old males for breeding.
Strategies of Characterization and Conservation of Small Animal Genetic Resources:

Various programmes have been identified for evaluation the native small Animal Genetic Resources including Phenotypic and Genotypic characterization. Strategies for their conservation and sustainable maintenance would be-

- Identification and listing of all the available animal germplasm
- Breed description and characterization.
- Establishment of breed societies
- Creation of database on AnGR
- Development of technology for collection and freezing of genetic material
- Documentation and creation of mass awareness.
- Methods of Conservation

In Situ

Can be taken up in Farmer’s herds/flocks

Establishment of Organized herds in breed tracts

Ex situ

- Organized herds outside breed tract(Institutional farms)
- Cryopreserved germplasm in form of Frozen semen, embryos etc.

In situ conservation in farmers’ herds

- Improvement of migration system and social recognition of small animal rearers.
- Re-seeding of wastelands/grasslands and controlled grazing in common pasture lands
- Controlled grazing in forests
- Stack-holder's involvement (Establishment of Breed societies)
- Incentives to farmers
- Improving economic efficiency of indigenous breeds
- Capacity building of small animal farmers

Improvement of migration system and social recognition of small animal rearers.

Some communities of our State are specialized in keeping large flocks of sheep and goats. They move a long distance in search of grazing land for their animals, remain months together away from their native village and return before onset of monsoon. This method of rearing sheep and goats has also helped in conservation of some of these germplasms. Emphasis is to be given to provide proper health care support at certain check posts to prevent and control of various diseases. This would help to improve the
productivity of these animals as well as provide socioeconomic benefit to those people who have been maintaining the valuable genetic resources.

**Re-seeding of wastelands/grasslands and controlled grazing in common pasture lands**

All the common pasturelands, wastelands and forests are shrinking every year and more and more land is coming under agricultural farming. Whatever grass lands and waste lands are remaining are having poor vegetation coverage due to uncontrolled grazing and failure of re-seedling. Sheep and goats which were economical under traditional raising system are unable to thrive under changing economic scenario. Therefore it is essential to conserve the grassland and ecology to save these native small animal resources.

In common grassland and pastures practices of silvi-pasture needs to be popularized. High yielding species of plants providing optimal loppings need to be planted in these lands. This would help in improving the stocking density of small animals.

**Controlled grazing in forests**

Though there is controversy whether grazing of sheep and goats should be in the forest or not, it has been well accepted that grazing of these animals has never led to the degradation of forest rather destruction of forest has resulted reduction in the germ pool of these animals. Grazing of animals in forests is well compensated by seed dispersal by them and providing nutrients to the plants through urine and droppings. Controlled grazing is to be allowed in forest to maintain the forest ecology, besides providing good and nutritive fodders to these animals for their survival.

**Stake-holders’ involvement (Establishment of Breed societies)**

Breeders’ Associations play an important role for development and maintenance of the breeds. No such organizations do exist in our State for development of small animal resources. For each important breed of sheep and goats associations involving the small animal farmers are to be formed. Cooperative society in pattern of Amul is to be formed for each sheep and goat breed. They will play important role for recognition of breeds for their improvement and conservation. Selection of outstanding animals true to their breed types from the larger population maintained in the breeding tracts can be taken up in collaboration with these cooperatives or associations.

**Incentives to farmers**

The main objective is to compensate the small animal farmers for the difference in levels of production between the breed of the animal under consideration and the replacement breed under the same animal management system or agro-ecosystem. This will attract the farmers and will ensure the conservation of the breed In Situ. It will be helpful in checking the erosion of different small animal germplasms of the State. The parameters of incentives can be made in different ways.
Improving economic efficiency of indigenous breeds

It has been experienced that the fertility and survivability of improved small animal breeds are poor as compared to the local breeds. Therefore use of improved germplasm for upgrading the local stock is to be restricted. Some practices like selective breeding within the breed, improvement of feeding practices, adequate health care are to be followed for improvement of the small animal resources of our State. This will help to enhance their economic efficiency and return to their rearers.

Training & Capacity building of small animal farmers and service providers

The sheep and goat farmers of the State are to be trained on basic aspects of sheep and goat production with emphasis on selection of male animals for reproduction, formulation of cheap rations for sheep and goats and control of major diseases. There is also need to sensitise them about the marketing of their animals to obtain maximum return.

For effective implementation of small animal developmental programmes and plan for conservation and management of these resources largely depends upon the capacities of the human resources associated for it.

The service providers especially the Vets and Paravets in collaboration with other agencies and NGOs should come forward for motivation, facilitation, capacity building, timely service providing and hand holding of the small animal keepers for the betterment of these valuable resources as well as for the animal keepers who depend upon these animals for their sustenance.

Breeding of Pigs –

The following procedures may be adopted for breed improvement.

(1) Intensive selection and out crossing (mating of unrelated individuals of same breed) is the best procedure.

(2) In India large population of pigs are indigenous non-descript pigs. These pigs can be graded up by successive use of boars either of Large white yorkshire or Landrace breed.

(3) Crossing among breeds is called cross breeding. Exp- Cross breeding can be practiced by crossing Yorkshire sows with a Landrace boar or vice-versa. Single crossing is mating of a boar and a sow of two different breeds. All the crossbred pigs will be marketed and the cross is repeated for the next crop of pigs.

Alternate use of boars of two breeds on the female stock produced in a herd is criss crossing.

Cross breeding can increase growth rate, litter size and livability.
References


*Kurup, MPG* (2003) - Livestock in Orissa, the Socio-economic perspective


*Sethi, B.P.*, (2007) - Present status and future strategy for growth and development of Animal Production in Orissa, Seminar on Road Map for Agriculture Development in Orissa, 6th -7th Nov. 2007

*Khamari, P.K.*, - Write up on Goat Rearing
# LESSON PLAN-14

Subject: **Small Animal Management, Project Planning and Social Mobilization**

Number of Students: 20

Duration: 90 mts

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**Topic:** Feed and feeding management of sheep & goat

**Lesson:** Theory / Practical

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**Objectives:**

At the end of the lesson the students will be able to:

- Explain the feed & water requirement of sheep and goat
- Formulate balanced ration using locally available feed material.
- Enlist different fodder trees & pasture crops
- Explain the process/methods of establishing pasture & trees.
- Explain the process of utilization of crop resides for sheep and goat feeding.
- Explain the milk replacer formula for kids.

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## Materials, Tools, Equipments:

- LCD
- Computer / Laptop
- Screen

## Teaching Aids:

- Handout
- PPT
- BB/WB
- Marker / Duster.

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**Remarks:**
<table>
<thead>
<tr>
<th>Time</th>
<th>Content : Steps / Key points</th>
<th>Methods</th>
<th>Aids</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 min</td>
<td>INTRODUCTION : Inventory list of traditional feed &amp; feeding.</td>
<td>Two way interaction</td>
<td>Planner</td>
</tr>
<tr>
<td></td>
<td>MAIN PART :</td>
<td></td>
<td>LCD</td>
</tr>
<tr>
<td>60 min</td>
<td>- Requirement of feed of sheep &amp; goats at different age.</td>
<td>Premade PPT on tale explanation.</td>
<td>Laptop</td>
</tr>
<tr>
<td></td>
<td>- How to formulate a balanced diet using locally available material, crop resides.</td>
<td>Premade PPT on tale explanation.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Pasture crops &amp; management of grazing land.</td>
<td>Premade PPT on tale explanation.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Trees useful for goats their rising &amp; management.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 min</td>
<td>CONCLUDING SESSION :</td>
<td>Question Answer</td>
<td>Planner</td>
</tr>
<tr>
<td></td>
<td>- Question Answer</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Subject: Small Animal Management, Project Planning & Social Mobilisation

Topic Feed and feeding management of sheep & goat

Objective:
At the end of the lesson the students will be able to:

- Explain the feed & water requirement of sheep and goat
- Formulate balanced ration using locally available feed material.
- Enlist different fodder trees & pasture crops
- Explain the process/methods of establishing pasture & trees.
- Explain the process of utilization of crop resides for sheep and goat feeding.
- Explain the milk replacer formula for kids.

Introduction:
Since sheep and goats are raised almost entirely on roughages the cost of production will be lower than that of poultry and pigs. Sheep and goats farming, due its quicker and better returns on investment provides an additional sources of income to farmers which normally depend on crops for their livelihood. Thus, these animals fit in ideally in a mixed farming system. At present extensive grazing on marginal grass land is going on. The indigenous breeds of seep and goats can subsist under the most adverse circumstances on scanty feeding. But their productivity is very low compare to exotic breeds. In an attempt to improve their production exotic breeds are introduced and crossbred progenies produced. When exotic genes are introduced the whole feeding patent has to be changed. The sheep and goats raiser will have to give special attention to feeding their animals to raise them satisfactorily.

Supplementary Feeding

The animals graze on crop stubbles, weeds and grasses on fallow as well as ranged lands. This will meet the requirement of the animals only partially. Their diet may be supplemented with cultivated fodders, grains and oil cakes especially during the critical period of production cycle occurring during the period of the year when the nutrient supplied is inadequate.
FEEDING OF SHEEP

Feeding the breeding ewe

The profit from these enterprises depends largely on the knowledge and ability of the farmer to feed his flock economically and derived maximum productivity. The feeding of ewes will be discussed under the following headings.

1. **Flushing** - About two weeks before the onset of the breeding season, nutrition of ewes should be stepped up to promote their body weight. This practice will bring ewes into heat earlier in the season thereby giving early lambs. It also has the effect of bringing of ewes into heat at more nearly at the same time than otherwise, resulting in a more uniform lambs crops besides flushing also increases the lambing rate and incidence of multiple births in the flock.

   Flushing ration for ewes may consist of any of the following:-

   (a) A good mixed pasture of legumes and grasses
   (b) A grass pasture plus 150g of wheat bran per head per day
   (c) Grass pasture plus 250g of grains and 250g of oil cakes
   (d) Legume hay full fed plus 100g of wheat bran and 150 to 200g of grain and
   (e) Green fodder at the rate of 10 percent of body weight and 100 g oil cake per head per day. This period is usually during the latter half of May in India.

2. **Feeding during breeding season** – The ration provide during flushing will continue during breeding season also.

3. **Feeding during early and mid-pregnancy** – Good feeding during gestation is the keystone for a healthy strong lamb crop. If feeding is inadequate or defective, weak or dead lambs will result. A weak lamb at the start is a liability than an asset for the sheep enterprise. Moreover, the productive life of a ewe is extended if she receives good feeding during her gestation periods. Proper feeding of the ewes is advantageous because it :{(i) increases the number of strong healthy live lambs born, (ii) prolongs the productive life of the ewes, (iii) increases milk yield by the ewes resulting in healthier weaner, (iv) improves the wool productivity, (v) lessens the incidence of lambing paralysis, and (vi) decreases the probability of ewes disowning their lambs as a result of exhaustion and weakness. The early and mid-pregnancy period is not very critical nutritionally. This does not means that extra nutritional requirements due to pregnancy are not much during early and mid-pregnancy and that the whole of their needs can be met entirely by grazing. Some ration recommended for ewes during this period is as follows:
(1) **Grazing:** On a good pasture.

(2) **Sorghum silage:** One to two kg sorghum silage plus legume hay half to one kg per head per day.

(3) **Ad libitum supply:** Plenty of maize or sorghum fodder plus 50 g of oil cakes like ground nut cake, per head per day.

(4) **Grazing on stubbles and harvested fields:** Supplemented with 100 g of oil cakes per head per day. This period falls from 8th July to 15th September in India.

4. **Feeding during late pregnancy:** The period from 16 September to 1 November is the most critical period nutritionally. During the first part of this period (16 September to 1 October) ewes may be allowed to graze on crop aftermaths, wild grasses and weeds. Their ration must be supplemented with available green fodder fed at the month of pregnancy (2 October to 1 November) as the foetus grows rapidly in the uterus. Lack of enough energy in the feed can cause pregnancy disease or ketosis in ewes. Therefore, molasses or grains (barley, maize, oats, etc.) may be fed at a rate of 225 g per head per day. Further, ewes should also receive available green fodder at the rate of seven kg per head per day.

5. **Feeding at lambing time:** As lambing time approaches or immediately after lambing, the grain allowance should be materially reduced but good quality dry roughage be fed free choice. After parturition, the ration of the ewe may be gradually increased so that she receives the full ration in six to seven day time. In general, bulky and laxative feed-stuffs may be included in the ration during the first few days. A mixture of wheat bran and barely or oats at 1:1 proportion is excellent. Soon after lambing, the ewe must be given just enough of slightly warm water. As soon as first lamb is born, set up creep feeders with lamb “starter” ration. An ideal starter ration can be 16 parts groundnut cake and 84 parts barley grain and available green or dry fodder.

6. **Feeding lactating ewes:** Ration for ewes must be supplemented to maintain adequate milk production which is necessary for rapid growth of lambs. If they are provided good pasture, the requirements are more or less met. When supplementary feeding is necessary, the amount of additional feed may be calculated as follows: An average ewe’s daily pasture requirement can be replaced by 50 per cent by 450 g of good hay, 1.4 kg silage or 250 g of grain. If they are fed cultivated green fodder, ten kg per head is sufficient.

7. **Feeding of ewes from the time lambs are weaned until flushing time.** This is the least critical period with respect to nutrient requirements. Ewes may be maintained entirely on pasture. Poor quality pastures and other roughages of low quality can be advantageously utilised during this period.
**Feeding Rams for Breeding**

Rams in normal condition require some additional nutrients during the breeding season. An over-fat ram on the other hand needs thinning before the commencement of the breeding season. This may be gradually done by a combination of feed reduction and vigorous exercise. The common practice is to allow the rams to graze with the ewes. Under such circumstances the rams will get the same ration as the ewes. Usually, it will meet the nutritional requirements of the ram. Where there are facilities for separate feeding of the ram, it may be given 250-400gm of a concentrate mixture consisting of 3 parts oats or barley, 1 maize and 1 part wheat per day.

**Lamb Feeding**

(a) **Feeding suckling lambs:** This is the early part of a lamb’s life in which it is dependent on its mother’s milk to a considerable degree for its nutrition. This period ends when the lamb are weaned. It will be most economical to put the ewes and lambs on good pasture. Grazing on good pasture will sustain milk production of the ewes at a high level. Similarly, the lambs also will nibble at succulent green forage. But, the pastures available are often of poor quality and poorly managed. Under such circumstances, the rations of these lambs may be supplemented with grains and oil cakes in addition to their mother’s milk and pasture. Depending on the economic situation and the availability of pasture, one may decide to raise them or sell them at weaning time.

(b) **Feeding early-weaned and orphan lambs:** Lambs are usually weaned at five months of age. But early weaning at twelve weeks of age has been found to be advantageous and will intensify the whole operation. Similarly, some lambs may be orphaned due to the death of ewe or due to disowning by the mother. Young sucking lambs on creep feeding, early-leaners and orphan lambs must be well fed.

(c) **Ration for creep feeders, early weaners and orphans:** Upto six weeks age, grains should be cracked before feeding to lambs. After this, grains can be fed as such except in the case of hard grains which may be cracked, crimped or rolled. These infant lambs should get good pasture or high quality legume hay preferably in the pelleted form in addition to the grains. If legume hay or good quality pasture is not available and if only poor roughage is fed their grain ration should be supplemented with a protein cum vitamin supplement with approximately 12 per cent digestible crude protein.

Studies at Ohio State University indicated that lambs can be raised well upto eight weeks with milk from the ewe and dehydrated Lucerne pellets. From eight weeks onwards they need grains and oil cakes. Complete pelleted ration consisting of roughage and concentrate, both mixed and made into pellets has been found to be advantageous. Lambs had been found to consume more and grow faster. The pellets are self-fed and the nutrient intake is controlled by varying the composition of the
pellets as the capacity of consuming bulk is more or less fixed. To start with, the pellets will have 65 to 70 per cent roughages but decreased gradually to 50 per cent by ten to twelve weeks age.

A few recommended rations for the creep feeders and early weaners are as follows:

(i) Maize 40 per cent, oats 30 per cent, barley 30 per cent plus Lucerne hay fed ad libitum.
(ii) Oats 20 per cent, maize 40 per cent, barley 20 per cent, groundnut cake 20 per cent plus supplementation vitamins.
(iii) Maize 25 per cent, oats 40 per cent, wheat bran 20 per cent, groundnut cakes 15 per cent plus vitamins supplements.

(d) Feeding from weaning to market: The types of feeds used and the methods of feeding will vary with economic and climatic conditions and the feeds available. In developing countries, the policy should be to utilize grazing lands, waste lands and aftermath of grain crops as far as possible and supplement whatever is deficient, with harvested good quality fodder, hay or concentrates. An average lamb may be fed 225 to 450g of a grain mixture (Table1) depending upon the grazing condition. If there is plenty off grazing 225 g is sufficient. In overgrazed grassland they may be given 450g of the concentrate mixture plus ½ to 2 kg of good green fodder.

Table 14: Concentrate mixtures for supplementing lamb along with grazing

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>During summer</th>
<th>During Winter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groundnut cake</td>
<td>20 %</td>
<td>25%</td>
</tr>
<tr>
<td>Wheat bran</td>
<td>35 %</td>
<td>25%</td>
</tr>
<tr>
<td>Crushed gram</td>
<td>10 %</td>
<td>-</td>
</tr>
<tr>
<td>Oat/Barley</td>
<td>35 %</td>
<td>50%</td>
</tr>
</tbody>
</table>

FEEDING OF GOATS

Feeding habit of Goats

Goats are ruminant and able to graze on very short grass and browse foliage not normally eaten by other domestic livestock. They refuse any kind of feed which has been soiled either by itself or by others. They consume wide varieties of feeds and vegetation. The rumen is not developed at birth, but young kids start picking hay or grass at 2-3 weeks of age and by 3-4 months the rumen is fully functional. Goats can browse (eating leaves of bush and trees) for about 8-9 hours a day. But additional leguminous fodders as well as concentrates feed should be provided to them for growth, and more yield of milk and meat.
Goats have greater capacity for dry matter in take than cattle and other large ruminants. Dairy Goats in temperate region takes five to six percent dry matter as against four to five percent per head per day by tropical dairy goats. The meat type goats consume 2.5 – 3 percent of live weight.

Feeding Systems:

1. **Tethering**: Most common and popular system accepted by goat farmers in India. Here only two or three goats are raised. The goats are closely controlled. The goats depend upon the crop residue.

2. **Extensive system**: Goats find opportunity to browse for about 8-9 hours per day. Only maintenance of the goats are taken care of. Rate of growth is slow. Goats walk long distances in search of feed and fodder. Inadequate protein and energy is available resulting in low productivity. There are variations in availability of feed for regard to region and season to season.

3. **Semi intensive system**: This is a combination of intensive and Semi intensive system. Limited free range grazing is allowed with stall feeding. Goats of different farmers are grazed together for 4 to 5 hours a day and then kept in stalls where they are offered tree leaves, hay, dry fodder, greens, kitchen wastes, crop residues and concentrated mixture. Here the level of nutrition is better than the goats found in extensive system.

4. **Intensive system**: In this system the goats are kept in stall and cultivated fodder (fresh and conserved) and concentration to meet their requirements.

Feeding of kids (Creep feeding)

Separate goat milk for human consumption and to get a faster gain in kids it is required to provide them a balance starter feed known as creep ration upto 10 weeks of age after nursing the kids for four to seven days on colostrums and milk fed kids should be separated from their dams and kept away on starter ration. They should be allowed restricted suckling two to three times a day or should be bottle fed a definite milk allowance.

Free choice legume hay, minerals and drinking water should be made available along with the starter ration. A few example of starter/creep ration calculated to supply about 12 to 18 percent DCP and 70 to 78 percent TDN have been given in table 2. Kidsshould be allowed to suck their dams for the first five days to receive colostrums, after five days kids may given whole milk @ 1/6th of their body weight for the first thirty days. It is better to wean the kids and feed this amount of milk from the pail or feeding bottle in equal installments. The quantity of milk may be reduced to 1/8th of body weight in the second month and 1/10th to one fifteen during the third month. From the second weeks onwards a palatable and easily digestible concentrated mixture and good quality of fodder may be offered to the kids as the kids increased the intake of concentrates and the milk may be reduced correspondingly upto 3 months of age.
Table 15: Composition of Starter/Creep ration

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Feeds</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Maize</td>
<td>60</td>
</tr>
<tr>
<td>Barley/Oat</td>
<td>23</td>
</tr>
<tr>
<td>GN cake</td>
<td>20</td>
</tr>
<tr>
<td>Fish meal</td>
<td>10</td>
</tr>
<tr>
<td>Molasses</td>
<td></td>
</tr>
<tr>
<td>Wheat bran</td>
<td>7</td>
</tr>
<tr>
<td>Mineral mixture</td>
<td>2</td>
</tr>
<tr>
<td>Common salt</td>
<td>1</td>
</tr>
<tr>
<td>DCP</td>
<td>18</td>
</tr>
<tr>
<td>TDN</td>
<td>78</td>
</tr>
</tbody>
</table>

- Add 150g TM-5/Aurofac
- Add 25g of vitablend/rovimix or 1 teaspoonful of shark liver oil
- Linseed cake/sesame cake/kusum cake/mustard cake may be used to replace GNC
- Jowar/bajra/ragi may be used to substitute 1/3 cereal grains
- Rice bran/small millets may be used to replace wheat bran on weight basis.

**Grower feeding ration**

A complete ration providing 9-10% DCP and 60-65% TDN with 20-25% dry matter from good quality roughage will meet the requirements. Fodders containing less energy and protein are to be balanced with the concentrate mixtures (Maize 50%; Wheat bran 30%; GN cake 10%; Molasses 7%; Mineral mixture 2% and salt 1%). If good quality roughages are not available concentrate may be fed @ 350 gm to 400 gm daily.

**Feeding of yearling does (Breeding Goats)**

Feeding of female kids and few males (Kept for breeding purpose) should be adjusted in such a way that their sexual maturity is achieved at 1 year with a body weight of 15 to 20 kg for small breed and 20-25kg in large breeds. After weaning at 8 to 10 kg body weight, no supplementary feeding of concentrate is required on good pasture, high quality hay and good browsing condition. However, during lean period, a small quantity (0.2 to 0.7 kg) concentrate may be fed.
Feeding of dry goats
Dry goats should be fed enough to rebuild their lost body reserves. A good lactating goat can not eat enough during her peak of production and she uses some of her reserve at this time to produce milk. Good leguminous fodders will meet its maintenance and other needs. However, if good fodder is not available then the goat should be fed with 400g concentrates in two lots, in the morning and evening feeding.

Feeding of Pregnant goats
The pregnant goats should be fed taking into consideration two aspects i. To meet the burden of pregnancy and ii. To rebuild the lost body reserves. Therefore, particularly during the last month of pregnancy, the goats should be fed leguminous fodder ad lib quantity along with concentrate at the level of 0.3kg per day. Free access to good pasture and roughage plus concentrate at a level of 0.2 to 0.5 kg per day (depending upon the condition of the doe) is usually recommended for the feeding of pregnant dry does.

Feeding of lactating does
The quantity of feed given to lactating does depend on the amount of milk produce. For every additional kg of milk produce, 0.4kg of concentrate or 1 kg of good quality of fodder may be fed. With in the above conditions, the goat should have free access to green leguminous fodder. In case, green fodder is not available, the goat should be fed with good quality leguminous hay.

Table – 16: Composition of concentrate mixture for lactating goats

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>% in feed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gram</td>
<td>15</td>
</tr>
<tr>
<td>Maize</td>
<td>37</td>
</tr>
<tr>
<td>GN cake</td>
<td>25</td>
</tr>
<tr>
<td>Wheat bran</td>
<td>20</td>
</tr>
<tr>
<td>Min Mix</td>
<td>2.5</td>
</tr>
<tr>
<td>Salt</td>
<td>0.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ration 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Maize</td>
<td>37</td>
</tr>
<tr>
<td>Oat</td>
<td>37</td>
</tr>
<tr>
<td>Wheat bran</td>
<td>16</td>
</tr>
<tr>
<td>Soyabean meal</td>
<td>9</td>
</tr>
<tr>
<td>Salt</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>
Feeding of breeding bucks

Breeding of bucks should be fed at the rate of 3 -3.5% of live weight to maintain normal health and fertility. Good pasture is sufficient for good health when not used for breeding, if pasture is not available; feeding of good quality hay and concentrate up to 0.7 kg per day will be sufficient to maintain the bucks. Two weeks before and during breeding, increase the concentrate allowance by 0.3 to 0.5 kg daily or more if the buck is large and is serving numerous does.

Special points of feeding of goats.

1. Extensive system of feeding should be gradually replaced by sub intensive or intensive system.
2. Goats should not be let loose for grazing until the dew has dried up i.e. two hours after sunrise. Grazing on wet grass with dew cause intestinal inflammation, tympanitis and parasitic infestations
3. Village common grazing lands should be protected from biotic factors and improved through reseeding with nutritious perennial and high yielding grass and legumes.
4. Fodder trees like pipal, neem, mango, banyan, mulberry, subabul, ashok, acacia etc. should be planted in large numbers in grazing lands, on bank of rivers, ponds and canals in agricultural fields.
5. Natural herb growing under plantation trees should be collected and conserved in the form of hay for feeding goats during scarcity period.
6. All available bushes, harmless weeds, crop residues and agro-industries by-products should be fed to goats.
7. All cereal grains in concentrated mixture must be crushed and oil cakes finely ground before feeding.
8. Goats should be offered roughages ad lib.
9. As a thumb rule 2/3 of the energy requirements should be met through roughages.
10. Half of roughages should be leguminous green fodders and rest half should be grasses/tender tree leaves. Among the roughages the goats have a preference to grasses like Doob, Anjan, Senji, Motha, Vegetables like carrot, radish, turnip tops, leaves of cabbage, cauliflower, mustard, spinach, turnip etc and cultivated fodders like Lucerne, berseem, cow pea, mustard, oat, jowar, maize, guar and hays and straw like oat hay, arhar bhusa, Paddy straw.
11. In the absence of good quality green fodders, concentrates must be considered to replace them.

Water Requirement for Sheep and Goat

Clean water should be supplied to goats ad-libictum. The factors like level of lactation, ambient temperature, water content of forage consumed, amount of exercise and salt and mineral content of the diet determine the amount of water to be required for a goat. They should be given water at least twice daily.

An average daily allowance of 18 litres of water is provided. They need at least 5 litres water in winter and 10 litres of water in summer. Goats in confinement generally drink 3 to 5 litres daily.
<table>
<thead>
<tr>
<th>LESSON PLAN-15</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Subject</strong> : Small Animal Management, Project Planning and Social Mobilization</td>
</tr>
<tr>
<td><strong>Topic</strong> : Preparation of small scale sheep, goat and Pig project and their economic analysis</td>
</tr>
<tr>
<td><strong>Lesson</strong> : Theory / Practical</td>
</tr>
</tbody>
</table>

**Objectives :**
At the end of the lesson the students will be able to:
- Explain about the economic analysis of the small animal farming.
- Prepare the schemes for management of small unit of sheep, goat and pig rearing with cost analysis and repayment schedule.

**Materials, Tools, Equipments :**
- LCD
- Computer / Laptop
- Screen

**Teaching Aids :**
- Handout
- PPT
- BB/WB
- Marker / Duster.

**Remarks :**
<table>
<thead>
<tr>
<th>Time</th>
<th>Content : Steps / Key points</th>
<th>Methods</th>
<th>Aids</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>INTRODUCTION :</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>Brain storming</td>
<td>White board</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Discussion</td>
<td>LCD</td>
</tr>
<tr>
<td></td>
<td>- Model Schemes</td>
<td>Lecture</td>
<td>White board</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lecture</td>
<td>White Board</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Discussion</td>
<td>LCD</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Discussion.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Technical Parameters</td>
<td>Discussion</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Discussion</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Discussion</td>
<td>White board</td>
</tr>
</tbody>
</table>


Subject: Small Animal Management, Project Planning & Social Mobilisation

Topic: Preparation of small scale sheep, goat and Pig project and their economic analysis

Objective:

At the end of the lesson the students will be able to:
- Explain about the economic analysis of the small animal farming.

Prepare the schemes for management of small unit of sheep, goat and pig rearing with cost analysis and repayment schedule.

**SCHEME FOR A GOAT FARM WITH 100 BLACK BENGAL DOES AND 5 BLACK BENGAL BUCKS.**

- The farm has to be located near a forest area providing enough browsing and grazing facilities. No concentrate feeds will be fed to the goats.
- The goat shed has to provide a floor space of 8sq.ft/doe, 12 sq.ft/buck with a dry Kucha Floor, thatched roof with wooden partition walls for bucks and does.
- It is envisaged that the does will kid thrice in two years with an average of $1\frac{1}{2}$ kids per kidding. The rate of mortality among kids and does have been considered to be about 20% and 5% respectively.
- The old does may be replaced in 2 lots, one in the 4th years and the second lot during the 5th ear replacing 50 does each time.
- The sale of progenies is to be made at the age of about one ear at an average of Rs.1500/- per progeny irrespective of sex. It is expected that the higher price for castrated male goats will help in leveling the price of both female and male progenies at an average saleable price of Rs. 1500/- per animal. The disposal of old doe may be made @ Rs. 1500/- per doe.
- In order to make the scheme feasible, the enterpriser needs to be provided with full amounts of both non-recurring and recurring expenses of the first year as loan from the bank with 12.5% interest/year. The depreciation charge will be @ 20% per year on the total amount of non-recurring expenditure.
- The payment of loan will start from the second year. Full clearance of the interest and principal loan will be made by the end of the 5th year.
Non-recurring expenditure
(i) Cost of 10 does with transportation

@ Rs. 1800/- each---------------------------------------------Rs.1,80,000/-

(ii) Cost of 5 bucks with transportation

@ Rs. 3000/- each--------------------------------------------- Rs. 15,000/-

(iii) Construction cost of goat shed@ Rs.80/sq.ft-----------------  Rs. 68,800/-

Total  Rs. 2,63,800/-

Table – 17: Recurring expenditure for five years

<table>
<thead>
<tr>
<th>Particulars</th>
<th>1st year</th>
<th>2nd year</th>
<th>3rd year</th>
<th>4th year</th>
<th>5th year</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>One attendant @ Rs.2500/- per month (Rs.30,000x5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Rs. 1,50,000</td>
</tr>
<tr>
<td>Contingency @ Rs.5000/- per year (Rs.5000x5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Rs. 25,000</td>
</tr>
<tr>
<td>Veterinary expenses @ Rs. 25/- per animal/year (Rs.2625x5)</td>
<td>13,125</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insurance @ 4% per year per animal (Rs. 7800x5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Rs. 39,000</td>
</tr>
<tr>
<td>Depreciation (Rs. 52760x5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Rs. 2,63,800</td>
</tr>
<tr>
<td>Interest @ 12.5%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Rs. 1,40,505.38</td>
</tr>
<tr>
<td>Total</td>
<td>63,1430.38</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table – 18: Animal Chart

<table>
<thead>
<tr>
<th>Particulars</th>
<th>1st year</th>
<th>2nd year</th>
<th>3rd year</th>
<th>4th year</th>
<th>5th year</th>
<th>At the end of 5th year</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of does</td>
<td>100</td>
<td>95</td>
<td>90</td>
<td>85</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>No. of bucks</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>No. of kiddings</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>No. of progenies</td>
<td>150-30=120</td>
<td>285-57=228</td>
<td>135-27=108</td>
<td>245-49=196</td>
<td>150-30=120</td>
<td>120</td>
</tr>
<tr>
<td>No. of kids retained for stock replacement</td>
<td>-</td>
<td>-</td>
<td>50</td>
<td>50</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>No. of progenies sold</td>
<td>-</td>
<td>120</td>
<td>228</td>
<td>58</td>
<td>146</td>
<td>-</td>
</tr>
<tr>
<td>No. of old doe sold</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>50</td>
<td>35</td>
<td>-</td>
</tr>
</tbody>
</table>

Table – 19: Receipts

<table>
<thead>
<tr>
<th>Year</th>
<th>Sale proceeds of progenies (Rs.)</th>
<th>Sale proceeds of Old does (Rs.)</th>
<th>Sale proceeds of manure (Rs.)</th>
<th>Total (Rs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>-</td>
<td>-</td>
<td>2000</td>
<td>2000</td>
</tr>
<tr>
<td>2nd</td>
<td>18000</td>
<td>-</td>
<td>2000</td>
<td>182000</td>
</tr>
<tr>
<td>3rd</td>
<td>342000</td>
<td>-</td>
<td>2000</td>
<td>344000</td>
</tr>
<tr>
<td>4th</td>
<td>87000</td>
<td>75000</td>
<td>2000</td>
<td>164000</td>
</tr>
<tr>
<td>5th</td>
<td>219000</td>
<td>525000</td>
<td>2000</td>
<td>273500</td>
</tr>
<tr>
<td></td>
<td>Cost of stock at hand Rs.1000/- per progeny and Rs. 1500/- per doe</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>120000</td>
<td>150000</td>
<td>-</td>
<td>270000</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>Rs.948000/-</td>
<td>Rs.277500/-</td>
<td>Rs.1235500/-</td>
</tr>
</tbody>
</table>
Table – 20: Repayment Schedule

<table>
<thead>
<tr>
<th>Year</th>
<th>Interest paid (Rs.)</th>
<th>Depreciation paid (Rs.)</th>
<th>Principal Loan paid (Rs.)</th>
<th>Total (Rs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2nd</td>
<td>77306</td>
<td>52760</td>
<td>-</td>
<td>130066</td>
</tr>
<tr>
<td>3rd</td>
<td>32058.125</td>
<td>105520</td>
<td>-</td>
<td>137578.125</td>
</tr>
<tr>
<td>4th</td>
<td>18868.125</td>
<td>52760</td>
<td>45425</td>
<td>71628.125</td>
</tr>
<tr>
<td>5th</td>
<td>12273.125</td>
<td>52760</td>
<td>45425</td>
<td>110458</td>
</tr>
<tr>
<td>Total</td>
<td>140505.38</td>
<td>263800</td>
<td>45425</td>
<td>449730.25</td>
</tr>
</tbody>
</table>

N.B.: Amount of loan obtained in 1st year = 263800+30000+5000+2625+7800 = 309225
(i) Total receipt in 5 years = Rs.12,37,500/-
(ii) Total liabilities in 5 years = (Rs.6,31,430+Rs.45,425) = Rs.6,76,855/-
(iii) Total Profit = Rs. 5,60,645/-

Table – 21: Economics of pig farming - At a glance

<table>
<thead>
<tr>
<th>1</th>
<th>Unit size</th>
<th>3 Sows with 1 Boar</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Type of animal</td>
<td>Improved</td>
</tr>
<tr>
<td>3</td>
<td>System of rearing</td>
<td>Semi intensive system</td>
</tr>
<tr>
<td>4</td>
<td>Unit cost (Rs.)</td>
<td>76,000</td>
</tr>
<tr>
<td>5</td>
<td>Bank loan (Rs.)</td>
<td>7,600</td>
</tr>
<tr>
<td>6</td>
<td>Margin money (Rs.)</td>
<td>49,400</td>
</tr>
<tr>
<td>7</td>
<td>Capital subsidy</td>
<td>19,000</td>
</tr>
<tr>
<td>7</td>
<td>Repayment period (years)</td>
<td>6 with one year grace period</td>
</tr>
<tr>
<td>8</td>
<td>Interest rate (%)</td>
<td>12</td>
</tr>
<tr>
<td>9</td>
<td>BCR at 15% DF</td>
<td>1.49:1</td>
</tr>
<tr>
<td>10</td>
<td>NPW at 15 % DF (Rs.)</td>
<td>83542</td>
</tr>
<tr>
<td>11</td>
<td>IRR (%)</td>
<td>&gt;50 %</td>
</tr>
</tbody>
</table>

Table – 22: Investment Cost:

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
<th>Physical Unit</th>
<th>Unit Cost (Rs./U)</th>
<th>Total Cost (Rs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 A</td>
<td>Boar Pen</td>
<td>70 sqft</td>
<td>70 sqft</td>
<td>4900.00</td>
</tr>
<tr>
<td>B</td>
<td>Sow Pens</td>
<td>60 sqft/sow</td>
<td>180 sqft</td>
<td>12600.00</td>
</tr>
<tr>
<td>C</td>
<td>Fattener Shed</td>
<td>12.5 sqft/fattener</td>
<td>250 sqft</td>
<td>17500.00</td>
</tr>
<tr>
<td>2</td>
<td>Equipment</td>
<td></td>
<td>LS</td>
<td>1000.00</td>
</tr>
<tr>
<td>A</td>
<td>Sow</td>
<td>Improved</td>
<td>3</td>
<td>7500.00</td>
</tr>
<tr>
<td>B</td>
<td>Boar</td>
<td>Improved</td>
<td>1</td>
<td>3000.00</td>
</tr>
<tr>
<td>4</td>
<td>Feed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Adults</td>
<td>3 kg/day/boar</td>
<td>4927 kg</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.5 kg/day/boar</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conc.Feed-30%</td>
<td>1477 kg</td>
<td>6</td>
<td>8862.00</td>
</tr>
<tr>
<td></td>
<td>Waste-70%</td>
<td>3450 kg</td>
<td>1</td>
<td>3450.00</td>
</tr>
</tbody>
</table>
### Table – 23: Techno – Economic Parameters

<table>
<thead>
<tr>
<th></th>
<th>Space requirement for shed (sqft)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Boar</td>
<td>:</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td>Sow</td>
<td>:</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>Fattener 3-8 months</td>
<td>:</td>
<td>12.5</td>
</tr>
<tr>
<td></td>
<td>Cost of shed (Rs./sqft)</td>
<td>:</td>
<td>70</td>
</tr>
<tr>
<td>2</td>
<td>Farrowing details</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Farrowing interval (month)</td>
<td>:</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>No. of piglets per sow</td>
<td>:</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Mortality among piglet (%)</td>
<td>:</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Mortality among fatteners (%)</td>
<td>:</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Weaning period (days)</td>
<td>:</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>Feed requirement : Kg/day</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Boar</td>
<td>:</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Sow</td>
<td>:</td>
<td>3.5</td>
</tr>
<tr>
<td></td>
<td>Fattener (Average)</td>
<td>:</td>
<td>1.75</td>
</tr>
<tr>
<td></td>
<td>Ratio of concentrate to total feed</td>
<td>:</td>
<td>30%</td>
</tr>
<tr>
<td></td>
<td>Cost of Conc. feed (Rs./kg)</td>
<td>:</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Cost of waste (Rs./kg)</td>
<td>:</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Cost of animals at purchase</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sow ~7 months age (Rs.)</td>
<td>:</td>
<td>2500</td>
</tr>
<tr>
<td></td>
<td>Boar ~7 months age (Rs.)</td>
<td>:</td>
<td>3000</td>
</tr>
<tr>
<td></td>
<td>Insurance (%)</td>
<td>:</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Labour</td>
<td>:</td>
<td>family labour</td>
</tr>
<tr>
<td></td>
<td>Cost of medicine, vaccine, etc.</td>
<td>:</td>
<td>Rs. 50/adult &amp; Rs. 25/fattener</td>
</tr>
<tr>
<td></td>
<td>Sale price of 8 months old fattener</td>
<td>:</td>
<td>Rs. 2000/fattener</td>
</tr>
<tr>
<td></td>
<td>Salvage value of animals</td>
<td>:</td>
<td>Adults -Rs. 2500/animal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>:</td>
<td>Piglets -Rs. 500 / animal</td>
</tr>
<tr>
<td></td>
<td>Depreciation (%)</td>
<td>:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Civil structures</td>
<td>:</td>
<td>5%</td>
</tr>
<tr>
<td></td>
<td>Equipments</td>
<td>:</td>
<td>10%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B</th>
<th>Fatteners (20)</th>
<th>1.75 kg/day/fattener</th>
<th>6300 kg</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Conc. Feed-30%</td>
<td>1890 kg</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Waste-70%</td>
<td>4410 kg</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>Insurance</td>
<td>5% of value of animals</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>Labour</td>
<td>Family</td>
<td>-</td>
</tr>
<tr>
<td>7</td>
<td>Cost of Medicines</td>
<td>- 4 Adults</td>
<td>50 per Fattener</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-</td>
<td>25 per Fattener</td>
</tr>
<tr>
<td>8</td>
<td>Misc. Expenses</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

| Total | 76000.00 |
Table – 24: Herd Projection Chart:

<table>
<thead>
<tr>
<th>Particulars</th>
<th>1st Year</th>
<th>2nd Year</th>
<th>3rd Year</th>
<th>4th Year</th>
<th>5th Year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>F</td>
<td>A</td>
<td>F</td>
<td>A</td>
</tr>
<tr>
<td>Opening Stock</td>
<td>1</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>No. of weaners at birth</td>
<td>-</td>
<td>-</td>
<td>14</td>
<td>13</td>
<td>-</td>
</tr>
<tr>
<td>Mortality - weaning period</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>Fattening period</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Sales</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Closing balance</td>
<td>1</td>
<td>3</td>
<td>10</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>NO. of fattening months</td>
<td>-</td>
<td>-</td>
<td>40</td>
<td>40</td>
<td>-</td>
</tr>
</tbody>
</table>

A – Adult
F - Fattener
<table>
<thead>
<tr>
<th>SLN. No.</th>
<th>Particulars</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>VI</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Cost</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Capital cost</td>
<td>4650</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>2</td>
<td>Recurring cost</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a</td>
<td>Conc. feed adult fattener</td>
<td>8862*</td>
<td>8862</td>
<td>8862</td>
<td>8862</td>
<td>8862</td>
<td>8862</td>
</tr>
<tr>
<td>b</td>
<td>Waste/Garbage</td>
<td>7560*</td>
<td>11340** (15120)</td>
<td>18900</td>
<td>15120</td>
<td>18900</td>
<td>18900</td>
</tr>
<tr>
<td></td>
<td>Adult</td>
<td>3450*</td>
<td>3450</td>
<td>3450</td>
<td>3450</td>
<td>3450</td>
<td>3450</td>
</tr>
<tr>
<td></td>
<td>Fattener</td>
<td>2940*</td>
<td>4410** (5880)</td>
<td>7350</td>
<td>5880</td>
<td>7350</td>
<td>5880</td>
</tr>
<tr>
<td>c</td>
<td>Vet. care</td>
<td>600*</td>
<td>1100** (1200)</td>
<td>700</td>
<td>1200</td>
<td>700</td>
<td>1200</td>
</tr>
<tr>
<td>d</td>
<td>Insurance</td>
<td>525*</td>
<td>525</td>
<td>525</td>
<td>525</td>
<td>525</td>
<td>525</td>
</tr>
<tr>
<td>e</td>
<td>Misc. expenses</td>
<td>213*</td>
<td>426</td>
<td>213</td>
<td>426</td>
<td>213</td>
<td>213</td>
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<tr>
<td></td>
<td>Total Cost</td>
<td>70650</td>
<td>30113 (35463)</td>
<td>40000</td>
<td>35463</td>
<td>40000</td>
<td>25463</td>
</tr>
<tr>
<td>II</td>
<td>Benefits</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a</td>
<td>Sale of fattener</td>
<td>100000</td>
<td>50000</td>
<td>100000</td>
<td>50000</td>
<td>100000</td>
<td></td>
</tr>
<tr>
<td>b</td>
<td>Salable value of closing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>stock</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c</td>
<td>Residual value of</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>shed/equipment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total Benefit</td>
<td>100000</td>
<td>50000</td>
<td>100000</td>
<td>50000</td>
<td>146000</td>
<td></td>
</tr>
</tbody>
</table>

|                  | Net Benefit (Total Cost-   |     |     |     |     |     |     |
|                  | Total Bene)                |     |     |     |     |     |     |
|                  | DF @ 15%                    | 0.87| 0.756| 0.658| 0.572| 0.497| 0.432|
|                  | PW @ 15%                    | -61465| 37714| 0| 45760| 33796|
|                  | NPW @ 15%                   | 83542|     |     |     |     |     |
|                  | BCR @ 15%                   | 1.49:1|     |     |     |     |     |
|                  | IRR                         | 61%|     |     |     |     |     |

* Capitalised
** Other than capitalized
@ Figures in parenthesis include the capitalised amount
Table-26: Repayment Schedule

Capital Subsidy : Rs.19,000/-
Bank Loan : Rs. 49,400/-
Interest : 12 %p.a.

<table>
<thead>
<tr>
<th>Year</th>
<th>Gross Surplus</th>
<th>Loan outstanding</th>
<th>Interest @ 12% p.a.</th>
<th>Repayment of principal</th>
<th>Total outgoings</th>
<th>Net Surplus</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bank loan</td>
<td>Bank loan</td>
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</tr>
<tr>
<td>1</td>
<td>-</td>
<td>49400</td>
<td>5928</td>
<td>0</td>
<td>5928</td>
<td>-5928</td>
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<tr>
<td>2</td>
<td>69887</td>
<td>49400</td>
<td>5928</td>
<td>15000</td>
<td>20928</td>
<td>48959</td>
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<tr>
<td>3</td>
<td>10000</td>
<td>34400</td>
<td>4128</td>
<td>0</td>
<td>4128</td>
<td>5872</td>
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<tr>
<td>4</td>
<td>64537</td>
<td>34400</td>
<td>4128</td>
<td>17000</td>
<td>21128</td>
<td>43409</td>
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<tr>
<td>5</td>
<td>10000</td>
<td>17400</td>
<td>2088</td>
<td>0</td>
<td>2088</td>
<td>7912</td>
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<td>6</td>
<td>64537</td>
<td>17400</td>
<td>2088</td>
<td>17400</td>
<td>19488</td>
<td>45049</td>
</tr>
</tbody>
</table>
Subject: Small Animal Management, Project Planning and Social Mobilization  
Number of Students: 20  
Duration: 90min

Topic: Fodder crop and fodder trees for small animals and visit to fodder farm.  
Lesson: Theory / Practical

**Objectives:**
At the end of the lesson the students will be able to:

- Explain about different types of fodder trees and crops for small animals
- Describe about raising of fodder trees and crops
- Explain about planning for requirement and availability of fodder to small animals during lean period

**Materials, Tools, Equipments:**
- LCD
- Computer / Laptop
- Screen

**Teaching Aids:**
- Handout
- PPT
- BB/WB
- Marker / Duster.

**Remarks:**
<table>
<thead>
<tr>
<th>Time</th>
<th>Content : Steps / Key points</th>
<th>Methods</th>
<th>Aids</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 Mins</td>
<td>INTRODUCTION</td>
<td>Brain storming</td>
<td>WB/Marker</td>
</tr>
<tr>
<td></td>
<td>- Fodder trees and crops consumption by sheep, goat and pigs</td>
<td>G.D.</td>
<td></td>
</tr>
<tr>
<td>20 Mins</td>
<td>MAIN PART</td>
<td>Lecture</td>
<td></td>
</tr>
<tr>
<td>30 Min</td>
<td>- Different types of fodder trees and crops for small animals</td>
<td>Power point</td>
<td>WB/Marker</td>
</tr>
<tr>
<td></td>
<td>- Availability of fodder trees and crops</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Raising of fodder trees and crops</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Planning for requirement and availability of fodder to small animals during lean period</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Visit to Fodder Farm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 Mins</td>
<td>CONCLUDING SESSION</td>
<td>G.D.</td>
<td>WB/Marker</td>
</tr>
<tr>
<td></td>
<td>Advantages of feeding fodder trees and crops to small animals</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

129
Subject: Small Animal Management, Project Planning & Social Mobilisation

Topic: Fodder Crops and fodder trees for small animals and visit to fodder farm.

Objective:

At the end of the lesson the students will be able to:

- Explain about different types of fodder trees and crops for small animals
- Describe about raising of fodder trees and crops
- Explain about planning for requirement and availability of fodder to small animals during lean period

Introduction:

In Orissa goat and sheep keeping is an important activity of small holder for their livelihood. They raise goats / sheep mostly for meat purpose. These small animals are kept by marginal and landless agricultural labourers for their livelihood. In general they spend nothing on feed and fodder input, mainly due to small herd size and availability of greens on common land, road side bushes as well as private land. The sheep and goat of these resource poor farmers are either let loose or guided in the morning and browse on bushy forest or graze on natural biomass and thrive. The feed requirement of these small animals can be met from the green leaves. The adult goat can obtain 2/3 of its energy requirement for their growth from the green leaves. They also have the ability to digest the dry fodder.

Routine concentrate feeding of sheep and goats is thus not in practice in many parts of the state as they are raised by the resource poor farmers.

As mentioned these small animals are mostly raised by the poorest of the poor section of the society. Maintaining availability of adequate feed for their livestock is crucial to small holders as several factors continue to threaten the continuous supply. They depend on, grass available in common land or fellow land & agricultural crop residues. Traditionally the effort to improve the quality and availability is always focused on the technology but at the same time we have to realize that the small scale farmers do not always have the resource to take up new technologies.

Traditionally the solution to this challenge, has always been to promote the cultivation of fodder crops, pasture crops and fodder trees that are nutritionally beneficial increasing the yield and hence the availability. While this might work for large scale operators, small scale and land less farmers do not have the resource to take these new technologies. For them regulated grazing of small animals in a locality definitely allows rest to the natural vegetation to come up again and again without any measure
investment. In the perspective of small animal development in Orissa. Irrespective of the situation of farmer, there have to be a shift from free fodder from common land to alternate fodder.

Depending on the type of rearing such as extensive, semi intensive and intensive, the fodder planning has to be there and different species for different type are to be understood properly.

**Different fodder crops for extensive type of small animal raising**

In the extensive type of raising of small animals the herdsman guides the flock to different location for grazing. Continuous grazing over a common land usually degrades the land. But it has to be understood that over grazing is a function of time, not the animal number and degradation occurs when animals returns to the same plants before it had time to regenerate. When animals are allowed to roam around at their will they will obviously revisit plants before the plants can regenerate. Therefore a rest period with little bit of fertilization can boost the regeneration of the natural flora or vegetation of a grazing land.

The fodder crops for extensive type of raising should have the traits like

- Nutritionally rich, high coppicing ability, quick regenerating, self seeding,& being able to sustain the trampling pressure.

Some of the pasture species for small animals that are preferred on grazing land are

- Stylosnathes scabra, S. hamata
- Atylosia scaraboides( bana biri)
- Clitoria ternatia( aparajita)
- Siratro ( Macroptilium atropurpureus)
- Desmodium intortum ( green leaf)
- Centrosoea pubiscense( centro)
- Dolichus lablab ( carpet legume),
- Cenchrus setigerous ( dhaman grass)
- Andropogon gynus( sada bahar)
- Chrysopogon fulvus
- Pennesetum pedicillatum( PP grass or Denanath)
- Brachiaria ruazizinensis (Congo signal)
- Brachiaria humicola ( humidicola)

Establishment of a new pasture with introduction of selected desired species are difficult but not impossible. Steps to be followed include

- Weeding out all undesired species by way of burning or applying weedicide
- Application of farm yard manure or well rotten cow dung evenly on the entire field
- Plouging to be taken up to make the soil loose at least one-two inch deep
• Upon sowing the seeds should be covered with soil by brooming with a twig of tree
• Over seeding should be taken up to avoid any germination failure
• Sowing to be taken up during the drizzling and before regular rain
• First year should an establishment year to allow the crops to develop seed and allow the seed to fall for reseeding.

Some of the pasture shrubs for small animals that are preferred on grazing land
• Desmanthus virgatus (dasrath grass)
• Cajanus canjan (dual purpose arhar)
• Ziziphus nummularia
• Bauhinia varigata (kanchan)

Some of the fodder trees for small animals that are preferred on grazing land
• Leueana lucecephala (subabul)
• Sesbania grandiflora (agasti)
• Sebania sesban (jayanti, sheveri)
• Gliricidia sepium (gliricidia)
• Prospis juliflora & P. cineraria,
• Inga dulces
• Zizipus nummularia

Leucaena lucecephala commonly known as Subabul is a multi purpose tree and it is very much relished by the goats

Fig -10
Centrosema commonly known as Centro are self seeding, fast growing, and trailing. It can be planted along the fence line so as to give a thick coverage to fence and field bunds.

Fig -11

Stylo is a self seeding, nutritious, leguminous cover crop for barren land that can be grown for goats as a grazing crop in waste lands.

Fig -12

These shrubs & trees should be:
- first raised in the a nursery close to home and later on the saplings should be planted in the desired location during the continuous rain.
- Upon repeated harvest from these trees, more number of branches come out to make it bushy and leafy.
- Close spacing should be done to make it more like a hedge row.

**Different fodder crops for Semi intensive type of small animal raising**

The small animals are seasonally confined and cut and carry methods are adopted for a certain period.

Under this type of raising preferred fodder crops and trees include:
- Hedge rows of subabbol
- Line plantation of Prosopis
- Line plantation of Desmanthus
Collection of locally available trees and grazing on the paddy land where berseem is grown as a relay crop with paddy.

Different fodder crops for Intensive type of small animal raising

Under this type of raising the small animals are tethered and permanently housed and feed is carried to them. This requires extra effort to supply feed if the animals are not to suffer. Cooked rice bran, maize bran, wheat bran gram husk are to be offered to the animals in their daily ration.

Fodder crops included in this type of cut and carry method of feeding small animals:

- Hybed napier
- Maize
- Oats
- Cow pea,
- Berseem
- Lucern

Tree leaves of locally available species in Orissa are harvested and tied in front of the goats. These trees include;

- Neem (Azadirechta indica)
- Madhuca indica (mahula)- flower
- Limonia accidisssima (kaitha)
- Ficus hispida (dimiri)
- Ficus benghalensis (bara)
- Ficus religiosa (aswastha)
- Grewia asiatica (pharsa koli)
- Helianthus excelsa
- Inga dulcis (sima kaian)
- Emblica officinalis (Amla)
- Zizipus jujube
- Tamarindus indica (tentuli)
- Eugenia jambolana (jamboli)

Tree leaves of above trees and cultivated trees like subabool, Gliricidia sepium are fed in limited amount along with dry fodder.
Management of common land:

Section 4.8.3 of National Forest Policy, 1988 stipulates that grazing in forest should be regulated with the involvement of communities specially conservation area, young plantation and regeneration area should be protected. Enactment of this law completely restrict the small animals to enter into the forest. Thus if small animals are to be developed than it has to be encouraged in coherence with the efficient management of common land by involving the communities.

Strong and respected leadership from within community can be initiated and maintained in coherence with the ecological need of common land. The local organization can be developed by involving landless farmers, women, SHGs, Panchayat and Govt officials.
Subject: Small Animal Management, Project planning and social mobilization.  
**Number of Students**: 20  
**Duration**: 90mm

**Topic**: Action Plan of sheep and goat development  
**Lesson**: Theory / Practical

**Objectives**:  
At the end of the lesson the students will be able to  
- Discuss on sheep & goat development initiatives to be undertaken in the field.  
- Present the action plan in the plenary relating to sheep and goat development  
- Receive the suggestions given by participants for incorporation in the Action Plan.

**Materials, Tools, Equipment**:  
(for Practical in the Field, Lab,)

**Teaching Aids**:  
(AV Aids, Information Sheet, Assignment Sheet, Test etc.)  
White Board, Marker, handout, Brown sheet, Permanent marker

**Remarks**:  
The class will be more interactive in nature.  
The presenter will add or delete the suggestions by the other participants as feedback.
<table>
<thead>
<tr>
<th>Time</th>
<th>Content : Steps / Key points</th>
<th>Methods</th>
<th>Aids</th>
</tr>
</thead>
</table>
| 10 min | **INTRODUCTION:**  
- Background of the home work (The aim is to maximize profit out of sheep/goat rearing). | Lecturer  | LCD and Computer  
Brown Sheet/Flip chart |
| 30 min | **MAIN PART:**  
- Status of the sheep & Goat in the area.  
- Opportunities for Small Animal rearing.  
- Explain Point wise that are enlisted in the flipchart/brown sheet | Discussion | LCD and Computer  
Brown Sheet/Flip chart |
| 50 Min | **CONCLUDING SESSION:**  
- Ask for suggestion  
- Add relevant points | Discussion | LCD  
LAPTOP/Computer  
Brown Sheet/Flip chart |
**Subject:** Small Animal Management, Project planning and social mobilization.  
**Number of Students:** 20

**Topic:** Development of comprehensive plan, (inclusive of Pig, Goat & Sheep) potentiality and intervention.  
Lesson: Theory / Practical  
**Duration:** 90mm

**Objectives:**  
At the end of the lesson the students will be able to  
- Prepare a comprehensive Action Plan with reference to output of the different group work  
- Enlist and incorporate the possible problems and probable solution faced during implementation in the working situation  
- Formulate the comprehensive Action Plan for Small Animal Development in the area.

**Materials, Tools, Equipment:**  
(for Practical in the Field, Lab.)

**Teaching Aids:**  
(AV Aids, Information Sheet, Assignment Sheet, Test etc.)  
White Board, Marker, handout, Brown sheet, Permanent marker

**Remarks:**
<table>
<thead>
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<th>Aids</th>
</tr>
</thead>
</table>
| 5 min | **INTRODUCTION :**  
Objective of the village wise comprehensive plan to maximize the income of the farmers from small animal farming | Lecturer   | LCD and LAPTOP              |
| 20min | **MAIN PART :**  
- Enlist the villages in the area  
- What are the services provided for small animal Development by Department and other line Department  
- Enlist the hindrance during the implementation of the sheep and goat programme  
- Find out the possible opportunities which can combat the problems  
- Formulation of plan for implantation of Small Animal development like  
  - Deworming  
  - Vaccination  
  - Formation of FIG  
  - Supply of Buck | Discussion | LCD and Computer Brown Sheet/Flip chart |
| 30mm  |                                                                                             |            | Brown Sheet/Flip chart      |
| 10 Min| **CONCLUDING SESSION :**  
Draft Plan in hand  
Suggestions for Individual group for improvement of the plan | Discussion |                         |
**Subject:** Small Animal Management, Project planning and social mobilization.  
**Number of Students:** 20  
**Duration:** 90min

**Topic:** Presentation of the final comprehensive Action Plan

**Lesson:** Theory / Practical

**Objectives:**
At the end of the session the students will be able to
- Present the village wise comprehensive Action Plan on small animal development in the field.
- Discuss about the questions made by the participants
- Incorporate the relevant suggestions made by the other participants

**Materials, Tools, Equipment:**
(for Practical in the Field, Lab.)

**Teaching Aids:**
(AV Aids, Information Sheet, Assignment Sheet, Test etc.)
White Board, Marker, handout, Brown sheet, Permanent marker

**Remarks:**
The class will be more interactive in nature.
The presenter will add or delete some of the points as suggested by the other participants in the feedback.
<table>
<thead>
<tr>
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<th>Methods</th>
<th>Aids</th>
</tr>
</thead>
</table>
| 20 min | INTRODUCTION :  
- Basis and Process of the comprehensive plan done | Lecturer | LCD |
| 10 min | MAIN PART :  
- Status of the Small Animal in the area.  
- Basis followed during preparation of plan with reference to group work  
- What are the existing problems of the area relating to sheep and goat development  
- Point wise discussion of the plan | Discussion | LCD and Computer  
Brown Sheet/Flip chart |
| 30 min | CONCLUDING SESSION :  
- Ask for suggestion  
- Add relevant points | Discussion | LCD and Computer  
Brown Sheet/Flip chart |
## LESSON PLAN - 20

<table>
<thead>
<tr>
<th>Subject:</th>
<th>Small Animal Management, Project Planning and Social Mobilization</th>
<th>Number of Participants:</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topic:</td>
<td>Valediction, Feedback</td>
<td>Duration:</td>
<td>90 mins</td>
</tr>
<tr>
<td>Lesson:</td>
<td>Theory / Practical</td>
<td>Theory</td>
<td></td>
</tr>
</tbody>
</table>

### Objectives:

- At the end of the lesson the participants will be able to....
- Clarify doubts on small animal rearing in their situation
- Evaluate the outcome of training to meet the expectations.
- Agree on the follow-up to the training
- Celebrate their learning through award of certificate

<table>
<thead>
<tr>
<th>Materials, Tools, Equipment: (for Practical in the Field, Lab,)</th>
<th>Teaching Aids: (AV Aids, Information Sheet, Assignment Sheet, Test etc.)</th>
</tr>
</thead>
</table>

### Remarks: (Notes for changes and adaptations of the lesson plan, for use in future classes)

Link the session to first session where all the participants have shared their expectations.
<table>
<thead>
<tr>
<th>Time</th>
<th>Content: Steps/ Key Points</th>
<th>Methods</th>
<th>Aids</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>INTRODUCTION</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Explain to participants that feedback is useful to improve future Training and to plan appropriate follow-up activities.</td>
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<tr>
<td></td>
<td>− Interest Raiser:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>− Objectives, Programme:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>**MAIN PART * **</td>
<td></td>
<td>Example Evaluation Form</td>
</tr>
<tr>
<td></td>
<td>Participants will be encouraged to ask questions for improving their farming.</td>
<td></td>
<td>Filled in certificate</td>
</tr>
<tr>
<td></td>
<td>A panel of resource persons (Veterinary Dept./Banks/Insurance company/PRI members/ Block officials) may be invited to address the participants.</td>
<td></td>
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<tr>
<td></td>
<td>Feedback about the training programme</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Ask participants whether they feel that their expectations have been met and to what extent they have achieved their objectives.</td>
<td></td>
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<tr>
<td></td>
<td>The certificate will be distributed at the end of training.</td>
<td></td>
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</tr>
<tr>
<td></td>
<td><strong>CONCLUDING SESSION</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>− Summary, Review:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>− Test</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>− Home work</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>− Hints for next lesson</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Learning Exercise |  | Class room exercise √ | Practical

Title of the assignment: Feedback
Size of the Group: 20
Task: The facilitator will explain the procedure to mark in written feedback sheet fixed in the wall.
Different working steps Both a written and oral feedback will be carried out.

The pre – designed feedback sheet will be fixed in the wall and each participant will be asked to mark in the appropriate place. Written feedback will be collected from the participants.

The trainer will ask the participants about the following things and record it in a large sheet of paper for future reference to revisit the curricula. The oral feedback will be encouraged from each and individual participants. The oral feedback will be collected and recorded by the trainer.

Presentation of the result:
Material: Written feedback form sheet
Brown sheet, Marker, adhesive tape

Time Frame:
For the exercise/Group work: 30 mins
For the presentation: Min. 30

Criteria for the evaluation:
**CHECK LIST**

**WRITTEN FEEDBACK SHEET:**

1. In general, how would you rate the Training?

   - Excellent
   - No use at all

   ![Smiley Faces]

**ORAL FEEDBACK:**

1. Which topics or exercises were the most helpful or useful to you?
2. Which topics or exercises were the least helpful or useful to you?
3. What topics need more explanation?
4. What did you learn or gain most at this programme?