Better Lives Through Livestock

Targeting interventions to increase animal productivity and income
AIP-Livestock Scientist

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Aiming our research to transform selected pro-poor value chains

Focusing research to design and generate evidence for large-scale dissemination of interventions

Prioritizing an appropriate balance of short and long-term research on the productivity drivers and social science

**Commissioned Research Platforms**

- Productivity: Feeds and Feeding, Animal health, Breeding
- Market Innovation
- Targeting & Impact

**Dissemination of intervention led by Volunteer farmers and partners**

**Research partners working together at value chain level**

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## Main Activities

### Dairy Value Chain
- Training of project partners on the concept of LVC analyses
- Dairy value chain assessment to document 'best bet' interventions
- Training and value chain interventions for smallholder dairy producers, and input suppliers

### Small Ruminant Value Chain
- SR value chain assessment to document 'best bet' interventions
- Training and value chain interventions for SR producers, and input suppliers
- Training of NARS scientists, extension staff, goat breed association members on artificial insemination of goats

### Feed, Fodder & Rangeland
- Identification and promotion of improved forage varieties with high yield potential under dry conditions, including spineless Cactus
- Selection and promotion of Maize, wheat, rice & millet for increased nutritional value of residues
- Balanced feeding strategies
- Introduce rational grazing management

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Operational Areas

- Chakwāl, Pakistan
- Jhang, Pakistan
- Bahāwalnagar, Pakistan
- Bahawalpur, Pakistan
- Khairpur, Pakistan
- Tando Jam, Pakistan
- Matiari, Pakistan
- Pishān, Pakistan
- Quetta, Pakistan
- Nowshera, Pakistan
- Battikha, Pakistan
- Swat, Pakistan
- Muzaffarabad
- Kotli
- Skardu
- Gilgit
- Ziarat
Capacity Building: Federal and Provincial Level

- Livestock value chain
- Dairy VC-Rapid assessment
- Small ruminant VC-Rapid assessment
- Feed assessment tools (FEAST) training
- Training on PPR-Thermostable vaccine
- Training on use tablets with ODK for benchmarking
- Survey
- Artificial Insemination training in goats
- Rangeland Management training in Multan
- Small ruminants management training (only Quetta)
Capacity Building: Way Forward to Change Mindset

- ILRI is disseminating the concept and analysis of Livestock Value Chain to various stakeholders involved at various nodes and/or stages.
- Helps to establish closer links between different stakeholders of value chain.

Trained 514 (scientist & academia) and 540 livestock farmers (includes 185 female livestock farmers)
Snapshot Survey: An approach to identify best bets for interventions

**Snapshot survey helps to identify**

Proper housing leads to provide better animal health and quality milk

Adlib forage and water is needed to increase milk production

**Constraints**

Unhygienic conditions and transportation of milk

Timely immunization is needed to reduce vulnerability of animal to diseases

Value Chain Rapid Assessments and Snapshot survey laid foundation for best bet intervention
**Snapshot of the Dairy Sector in Balochistan**

Livestock in Balochistan
- Have 35-40% share in GDP
- Characterized by poor marketing
- Have colossal links with daily calories intake
- Traditional housing act as buffer against weather

**Diverse feed resources**

- Alfalfa
- Wheat bran
- Wheat straw
- Watermelon
- Apple

**Source of genetic variation**
Status of Green Fodder Availability for Livestock in AJ&K

Feed resources

<table>
<thead>
<tr>
<th>a. Dry grasses</th>
<th>b. Green grasses</th>
</tr>
</thead>
<tbody>
<tr>
<td>c. Tree leaves</td>
<td>d. Wheat straw</td>
</tr>
</tbody>
</table>

Problems:
- Land availability
- Insect-pest attack
- Poor agriculture extension services
- Timely availability of forage seed
- High input prices

Way Forward
- Proper mixing of straws (wheat, rice), dry grasses and tree leaves
- Strategic supplementation with concentrate to overcome nutrient deficiencies
- Introduction and propagation of dual purpose maize
Volunteer Farmer Training Models

Problems

- 25-30% feed wastage
- Causes competition between land for crop and fodder
- Uneven, muddy floor, lack of drainage contribute to low milk production and milk quality
- No water troughs, limiting water intake

Impacts: save up-to 30% feed wastage, ensure clean milk production and free access to water
Farmer Participatory trial on watering and feeding

**Increase in Milk Production - Buffalo**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Increase per animal (L/day)</th>
<th>From 5 million cows in milk (million L/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free access to water</td>
<td>0.5</td>
<td>0.250</td>
</tr>
<tr>
<td>Adlib water and feed</td>
<td>0.8</td>
<td>1.2</td>
</tr>
<tr>
<td>Adlib water and balanced Diet</td>
<td>1.3</td>
<td>1.2</td>
</tr>
</tbody>
</table>

**Increase in Milk Production - Cattle**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Increase per animal (L/day)</th>
<th>From 5 million cows in milk (million L/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free Access to water</td>
<td>0.3</td>
<td>1.0</td>
</tr>
<tr>
<td>Adlib water and feed</td>
<td>0.7</td>
<td>2.5</td>
</tr>
<tr>
<td>Adlib water and balanced Diet</td>
<td>1.2</td>
<td>5.0</td>
</tr>
</tbody>
</table>
Animal Health Issues

Facts and figures on FMD from District Bahawalnagar

• The incidence of FMD among dairy farmers is about 30-40% in project villages.
• The prevalence of FMD in large ruminants is about 60-70%.
• The livestock farmers were bearing on an average Rs. 100,000 loss due to death.
• The death rate of FMD affected calves are above 90% (<5 month) and 60% (between 05 to 12 months).
• Milk production is reduced by about 75-90%.

So far no incidence /death

7600 have been vaccinated
A Feeding Guide: To Create Awareness among Dairy Producers

Promoting balance feeding through locally available feed resources and enhanced livestock productivity
Milk-in (treble purpose) plastic can for milking

Benefits

- Large opening designed for easy cleaning
- Mountable funnel helps to detect mastitis and reduce spillage during milking
- Clip holes to fasten security seal
- Heavy duty cap designed to stop spillage during transport
- Calibrated container

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Milk-in (treble purpose) plastic can for milking

Is this the way for clean milk production and transportation?

Observation:
Milk-in can was tested for indigenous breeds of cattle and buffaloes in Pakistan.
- Suitable for Friesian cattle
- Height needs to be adjusted for crossbreds and buffaloes

Milk-in testing with exotic breeds (overseas) and indigenous breeds

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Herbal anthelmintic: Economic control of internal parasites

Hampered health sheep/goats productivity

Tape worm (Moniezia)
Round worms (Haemonchus)

Herbal Anthelmintic: Low cost, no side effects, no reported cases of drug resistance and easily available
Higher productivity through improved feeding management

Poor feeding practices leads to lower productivity:
- higher mortality due to stress and diseases
- Increases susceptibility to diseases

↑ mortality due to stress

Enhanced the productivity up-to 20%

The supplemental feeding daily at the rate of 0.5 kg/head at
- before gestation (15-20 days),
- during gestation period (40-50 days) and
- just after lambing/kidding (20-25 days)
Introduced PPR Thermo-stable vaccine (45 °C) developed by ILRI to Pakistan

The PPR vaccine currently produced in Pakistan are stable at 35°C as compared to the ILRI preparation which is thermo-stable at 45°C.

With the initiation of AIP-ILRI and FAO Pakistan, staff in these 2 laboratories are trained on the ILRI PPR recipe, and in May ‘15 1st batch was produced in VRI Lahore and is being tested.
Artificial Insemination in goats

- Beetal frozen semen straws are produced in 2 SPUs in KPK, and to-date have distributed >2000 straws
AI in Goats: Feed back from practitioners in KPK

To-date in KPK 1200 have been trained on AI in goats (850 government and private AI practitioners; and 250 Final year Veterinary students) Feed back from 100 AI practitioners are summarized below:

• Claimed success rate is 50-60%
• AI done in evening have higher probability of success
• Some farmer believe AI is more painful for doe than NI
• Kids from beetal semen are big and difficulty for teddy breed to carry
• Price of semen is Rs.30/straw; selling depends on distance
• Constraints in semen supply needs to be addressed
• Creating awareness among farmers about AI in goats is a key challenge
• In some areas farmers prefer semen of teddy instead of beetal
• Farmers are looking high milk production breeds
• Farmers having larger flocks do not depends on AI because of having their own bucks
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Highlights of Feed, Fodder and Rangeland Activities

- High Yielding Alfalfa and Millet
- Introducing and testing palatability of cactus in Pakistan
- Introduction of Improved forage varieties and village base seed enterprise
- Oats
- Rhodes grass
- Creating awareness among various stakeholders on rangelands in Pakistan

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Conventional and improved fodder production systems-Chakwal, Bahawalnagar, Jhang and AJK

Constraints: Low RF and limited irrigation leads to low fodder production; resulting in lower and seasonal availability of fodder leading to lower productivity of animals.

Basket of options

- Improved and Dual purpose cereals, Stay green maize, Mixed cropping systems; fodder calendars
- Local to high yielding multi-cuts varieties resulting in 60 to 80% increase biomass
The productivity of rangelands in Balochistan is declining due to:

- Overgrazing
- Uprooting of bushes for fuel wood
- Climate change

<table>
<thead>
<tr>
<th>Site(s)</th>
<th>Protected</th>
<th>Un-Protected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Month</td>
<td>June</td>
<td>August</td>
</tr>
<tr>
<td>Stocking rate</td>
<td>12 06</td>
<td>12 06</td>
</tr>
<tr>
<td>Bio-mass production</td>
<td>1706 820</td>
<td>639 350</td>
</tr>
</tbody>
</table>

**Recommendations**

- The policy and action plan on utilization of range-land resources needs to be formulated.
- Closer coordination between forest and livestock sectors leading to Conservation, rehabilitation and sustainable use of rangeland.
Nutritive Value of Maize Stover

NARC Maize Trials

Gilgit Maize Trials
Hydroponic: For Water and Land Scarce Areas? Economics? (in collaboration with Mr. Sohail Imdad)

Forget about

Tired about

Seed to feed in 7-days
Oxytocin does not increase the amount of milk, but merely makes it flow faster.

Makes the cow more friendly, sociable, cheerful, docile.......

It causes the equivalent of labor pains in the cow twice a day and destroys her reproductive system prematurely.
### Activities in Progress/Planned

#### Activities
- Fattening trial in Chakwal & Ziarat
- Small ruminants model farms in Chakwal
- Trainings on small ruminants value chain
- Caprine mastitis
- Selection manual on Nuqri goats
- AI in sheep
- Pictorial atlas on diseases of goat
- Feed and water trial on Azi-kheli breed in district Swat

#### Reports/training guides
- Benchmarking report
- Small ruminant rapid assessment report
- Forage survey report
- Calf survey report
- Ration Mobile
- Nutritive Value Tables for Ruminants in Pakistan
- Snapshot survey report on Sindh, Balochistan, AJ&K and Gilgit

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- Snapshots on calf rearing
- Best practices on calf management
- Formation of community organization
- Revitalization of farmers field school in KP
- Volunteer farmers training model in Sindh, KPK, Balochistan, AJ&K and Gilgit Baltistan
- Cholistan cattle show
- Judging manual on Sahiwal cattle
- Prevalence of Aflatoxins

- Feeding Tables: A Practical Guide for Extension workers
- Training Manual for Dairy Extension workers
- Taking Pictures – For Farmers
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ICARDA
Science for Better Livelihoods in Dry Areas

Food and Agriculture Organization of the United Nations
THANK YOU

From AIP-Livestock Family