



OPPORTUNITIES FOR IMPROVING FEED USE EFFICIENCY FOR SUSTAINABLE DAIRY PRODUCTION IN PAKISTAN

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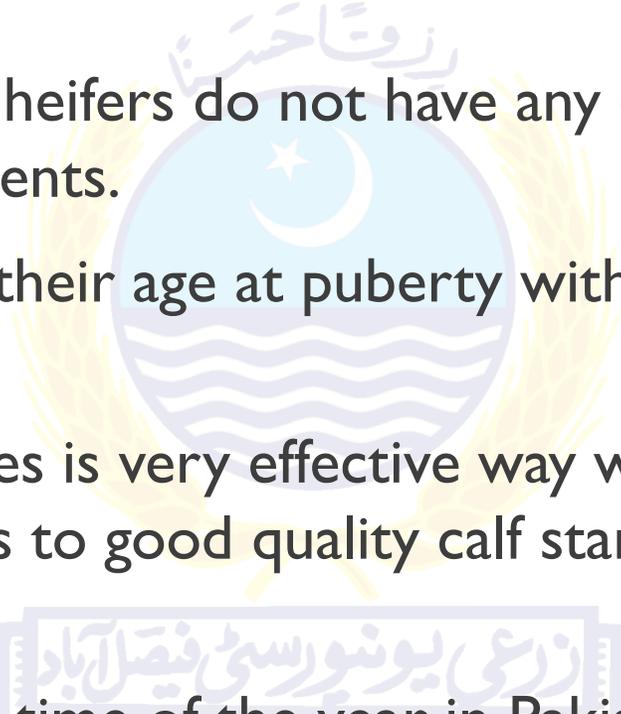
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BACKGROUND

- Livestock productivity in Pakistan, despite their known genetic potential, is low.
- This may be attributed to many reasons, amongst which probably the most important is **mal-nutrition**.
- Green fodders and quality feed are not available in sufficient quantities.
- Fodder scarcity extreme hot months (**June-July**) and during cold seasons (**December-January**) and most of the animals are **under-fed**.
- Straws of the cereals and other by-products are commonly used to overcome feed shortages, but don't meet the actual requirements of the animals.
- Cost of commercial feeds and feed ingredients (**home mix rations**) are higher.

EXISTING SITUATION OF DAIRY PRODUCTION

- Buffalo and cattle are main dairy animals making 30% of the total livestock.
- These dairy animals mostly thrive on low-quality feed stuffs.
- These include roughages and crop-residues with poor nutritive value resulting in poor production and reproduction performance.
- Recent investigations show that there is also issue of unjustified feeding without considering the production and physiological stages of dairy animals.
- This results in overfeeding of non-productive and under-feeding of productive-animals leading to poor feed use efficiency.

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- Furthermore, for the growing heifers do not have any efficient feeding system keeping in view their feeding requirements.
 - Proper feeding could reduce their age at puberty with significant reduction in the cost of feeding.
 - Similarly, early weaning of calves is very effective way without any adverse effects on growth when given free access to good quality calf starter and it could add to dairy economics.
 - Fodder scarcity during certain time of the year in Pakistan is another constraint toward sustainable dairying.

COMMON DAIRY ISSUES

Labor
Shortage

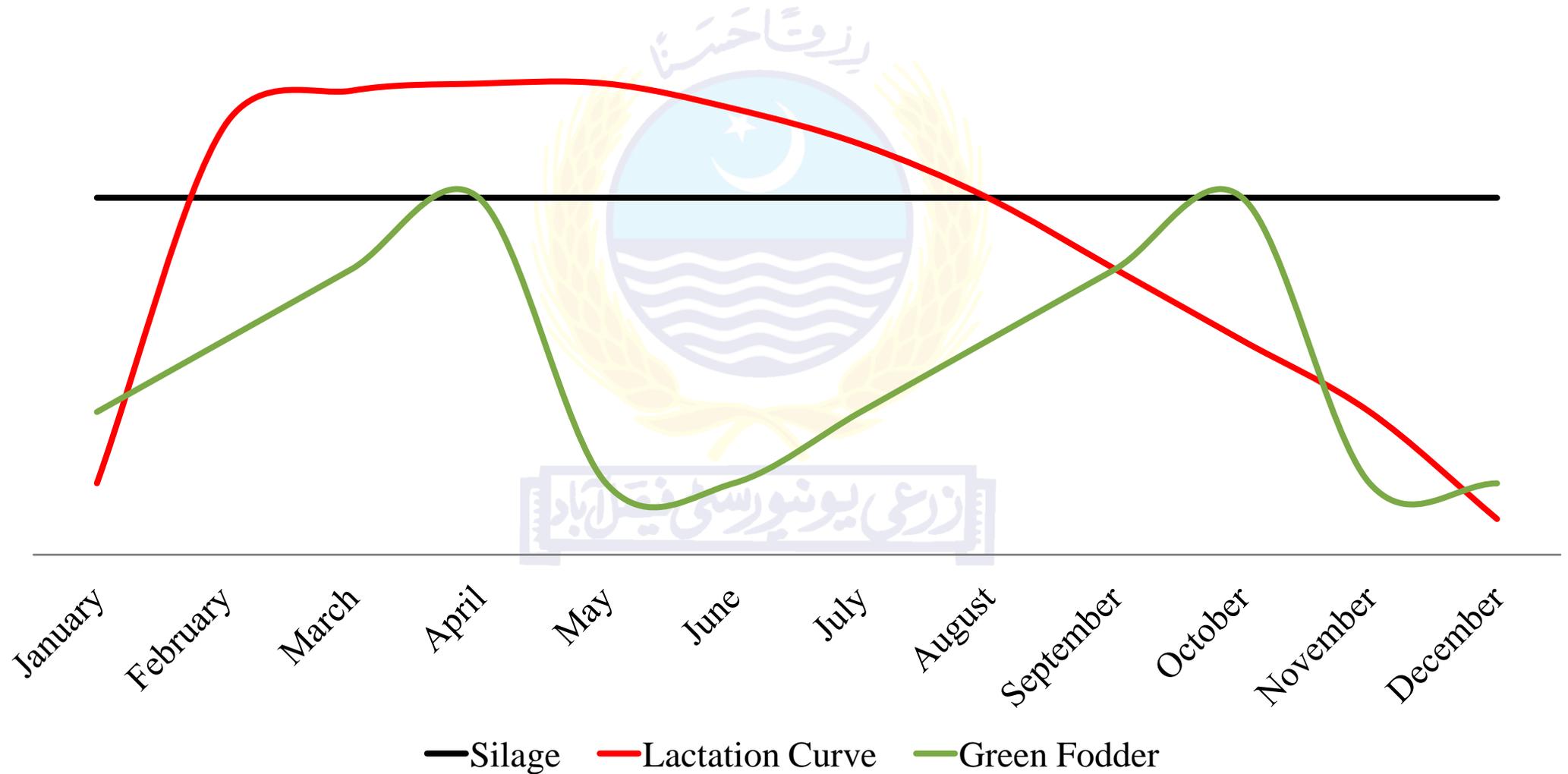
Fodder
Supply

Low
Digestibility

Low
Productivity

High
Stocking
Rate

HOW SILAGE FITS IN DAIRY SYSTEM?



OTHER OPTIONS COULD BE

- a. Drought, salinity and water logging restrict crops cultivation
- b. Major portion of livestock feed is derived from grasses e.g. maize, wheat, etc. & farmers select tall growing varieties with higher seeding rates
- c. Cereal's residue are conserved and stored Inappropriately

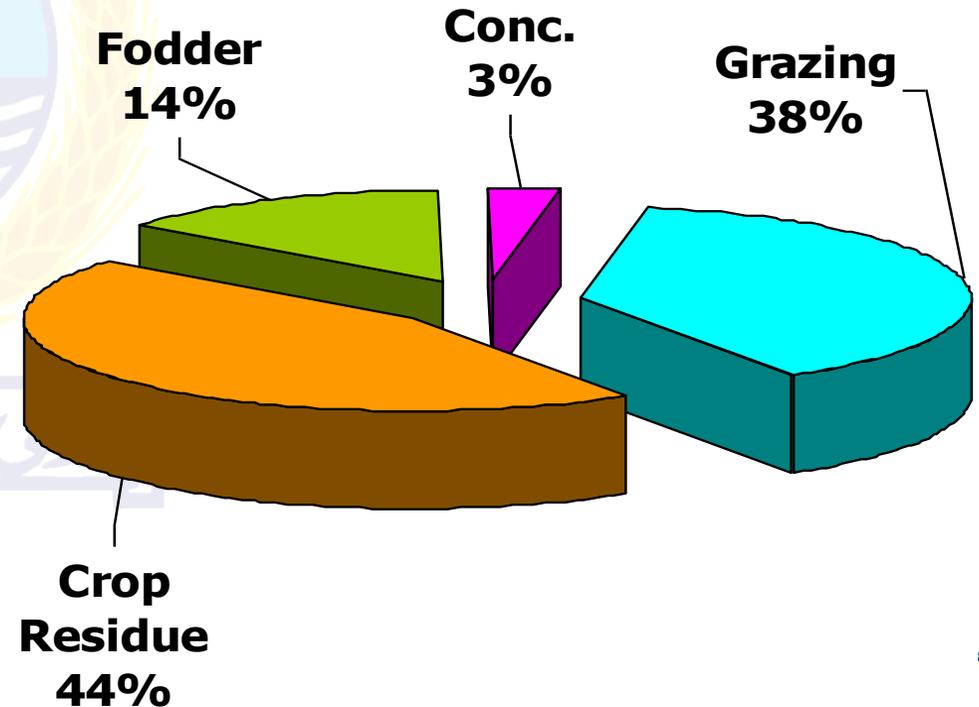


GREAT POTENTIAL IS TO FOCUS ON RANGELAND

- 51.3 m ha area (68%) of Pakistan is under rangeland
- Livestock is a major source of income and a source of livelihood
- There is huge dependency of poor on use of range & pasture resources



Feed Resources



Responsibility for improvement of rangeland?

MAJOR FODDER SPECIES ARE:

- i. Jawar or sorghum (*Sorghum bicolor*)
- ii. Maize (*Zea mays*)
- iii. Millet (*Pennisetum americanum*)
- iv. Berseem/Shaftal (*T. alexanrinum*/*T. resupinatum*)
- v. Oats (*Avena sativa*)
- vi. Mustard and
- vii. Gowara/guar (*Cyamopsis teragonoloba*)



Summer

Winter

EXISTING YIELD GAPE OF FODDER (100 – 200%)

Sr. No	Crop	Yield at farmer field (t/ha)	Yield at Research Station (t/ha)	Yield Gap (t/ha)
1	Berseem	45	90	45 (100%)
2	Lucern	40	90	50 (125%)
3	Oats	35	70	35 (100%)
4	Maize	35	60	25 (71%)
5	Jowar	40	60	20 (50%)
6	Bajra	30	45	15 (50%)
7	Sadabahar	45	65	20 (44%)
8	Sudangrass	30	50	20 (67%)
9	Guara	20	40	20 (100%)
10	Cowpea	15	25	10 (67%)
Mean		34	60	26

IMPROVEMENT IN PRODUCTION IS POSSIBLE THROUGH

- Certified seed availability/distribution
- Selection of suitable variety for soil
- and area's climate
- Balance inputs application and management
- Focus on hybrid fodder variety/species
- Cultivation of summer fodder legume
- Improve conservation practices



HOW TO MINIMIZE YIELD GAPE?

I. SEED PRODUCTION: TO ENSURE SEED AVAILABILITY OF THE HIGH YIELDING VARIETIES



2. RESOURCE MANAGEMENT OF SURPLUS FODDER

- Winter fodder (mainly legumes) summer fodders (mostly cereals)
- Hay making of winter legumes (oat, berseem etc.) and try to feed relatively balance feed round the year
- Improvement in conservation of summer fodder



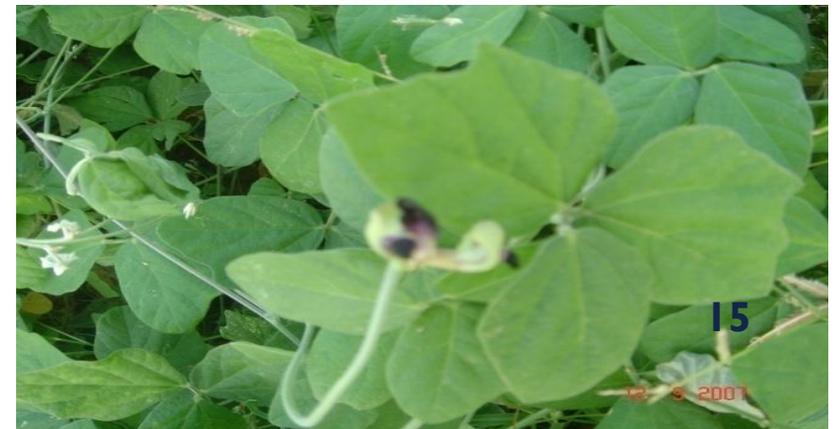
3. PROMOTION OF HIGHYIELDING FODDER HYBRIDS WITH GOOD NUTRITIVE QUALITY, RESISTANCE TO INSECTS, DISEASE AND DROUGHT

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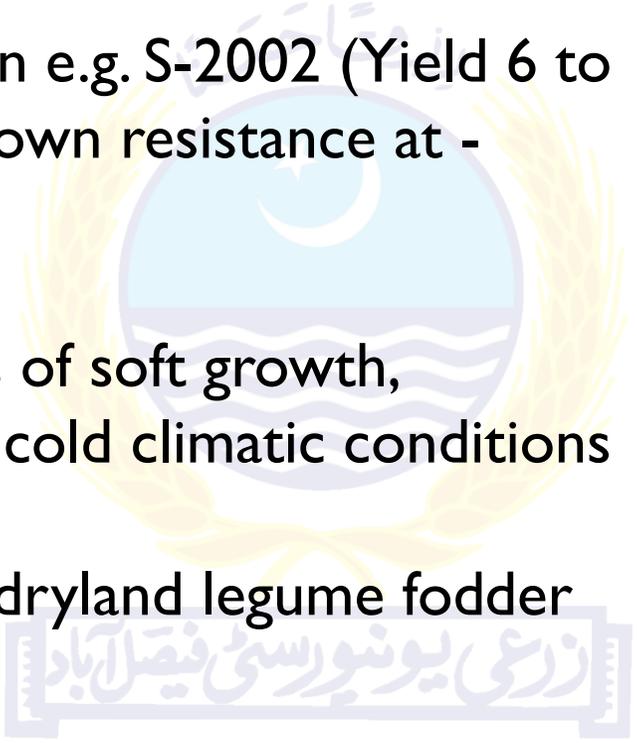
4. INTRODUCTION OF SUMMER LEGUMES IN COPPING SYSTEM

- Ebony cowpea yields <600 kg DM ha⁻¹ with long trailing growth habit
- *Dolichos lablab* yield <1500 kg DM ha⁻¹ can intercropped in Sugarcane in early Spring
- Siratro, a good summer legume with efficient growth as sole or mix with maize, sorghum and millet



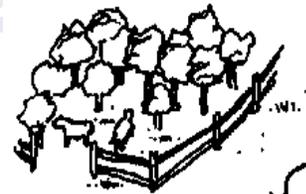
5. INTRODUCTION OF PERENNIAL WINTER FODDER SPECIES

- Encourage Lucerne cultivation e.g. S-2002 (Yield 6 to 8 cuts year-1); Sardi 10 has shown resistance at -10°C in Chitral
- Splenda sitaria: excellent grass of soft growth, resistant to hot and relatively cold climatic conditions
- Encourage vetch cultivation as dryland legume fodder



6. PROMOTE FODDER TREES FOR FIELD EDGES

- e.g. *Ailanthus altissima*,
- *Albizia*,
- *Elaeagnus angustifolia*,
- *Leucaena*, *Melia azedarach*,
- *Mora alba*,
- *Populus*, *Robinia pseudoacacia*,
- *Salix acmophylla*, etc.) in sub-humid eastern mountainous,
- wet eastern mountainous,
- and central valley plain,
- in arid area (*Atriplex sp.*).



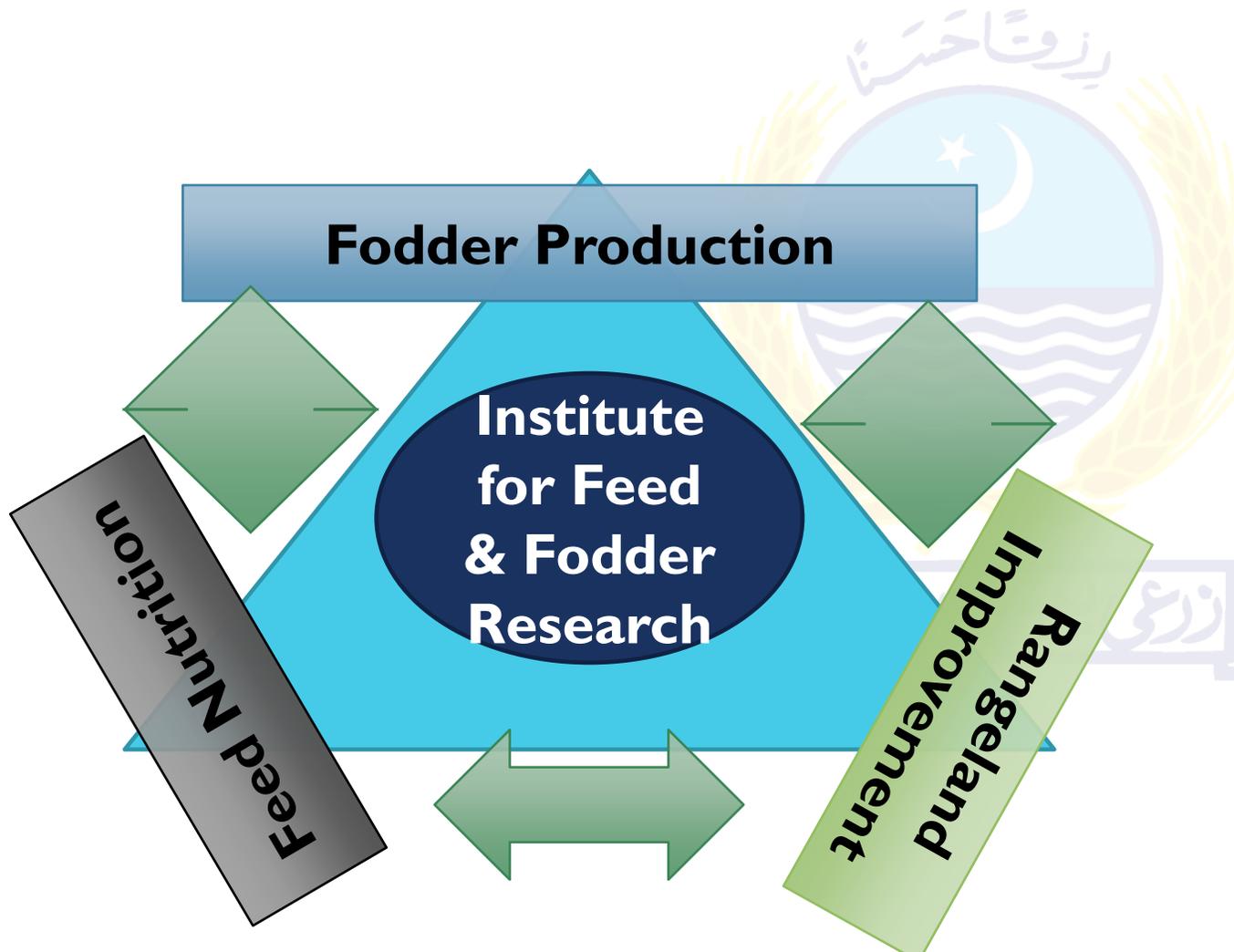
7. PROMOTE INTER CROPPING

- Cereal (maize, sorghum, millet) + legume
- Mixed wheat with Ipil Ipil (*Leucaena leucocephala*), Oats + vetch
- Berseem in lucerne (line sowing)
- Lucerne + Splinda cultivation



8. Training on fodder production

FUTURE LIVESTOCK FEED CAN BE ENSURED THROUGH COORDINATION



CONCLUSIONS

- Developing innovative approaches and solutions:
- Hay and silage making to these scarcity periods
- Developments in dairy nutrition like:
 - ❖ Establishment of nutrient requirements for dairy animals
 - ❖ Feeding practices of dairy animals according to stage of lactation and production
 - ❖ Proper feeding systems for growing heifers
 - ❖ Effective milk replacer feeding for calves
- Could effectively lead to sustained dairy production in Pakistan.



THANKS