Feeds & Nutrition for Productivity Enhancement

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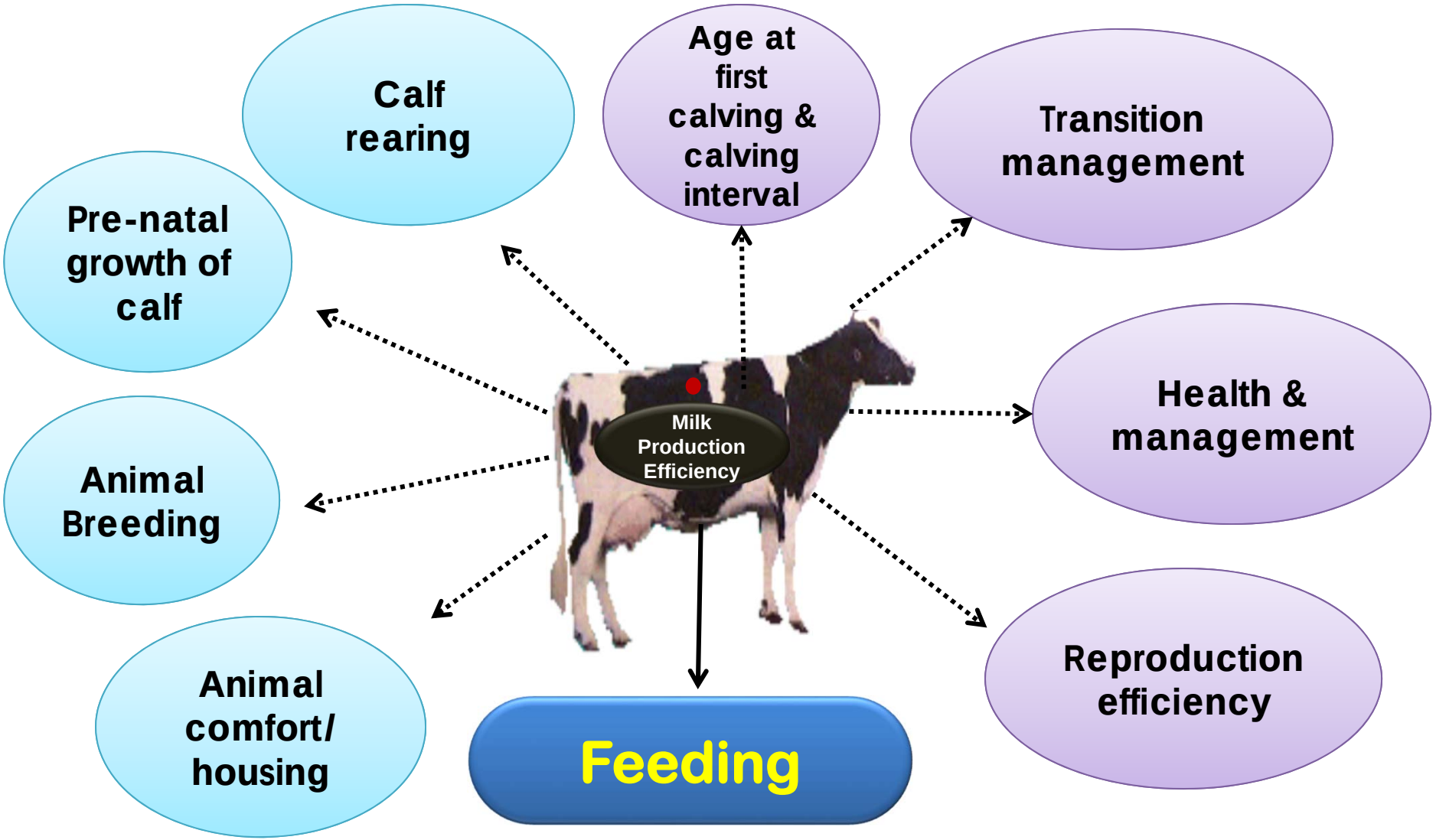
Factors Affecting Milk Production Efficiency & Productive Life



Availability of feed resources in India

Shortage of feed resources & milk production/productivity

- Are we taking into account all feed resources/ biomass used for animal feeding?
- Are we supplementing deficient minerals in the ration?
- Are we tapping all potential feed resources?
- Are we adding value to the available feed resources?

Unaccounted feed resources

Shortage of feed resources has been documented, however, several feed resources are not taken into account:

1. Local grasses, tree leaves (khejari, ber, moringa, gliricidia, subabul, banana, pipal, anjan), weeds etc.
2. By-products of starch & soybean industries
3. Vegetable waste such as potatoes, pea pods, carrot tops, tomato pomace, vegetable waste from mandis.
4. Unconventional feeds such as babul pods, prosopis pods, tamarind seed powder, mango kernel extraction etc.

Untapped feed resources

Cotton stalks & other by-products

Mustard & soybean straws

Burning of paddy and wheat straws

Banana stem, leaves & other by-products

Horticulture wastes: pine-apple, citrus fruit etc.

Areca nut sheath & other by-products

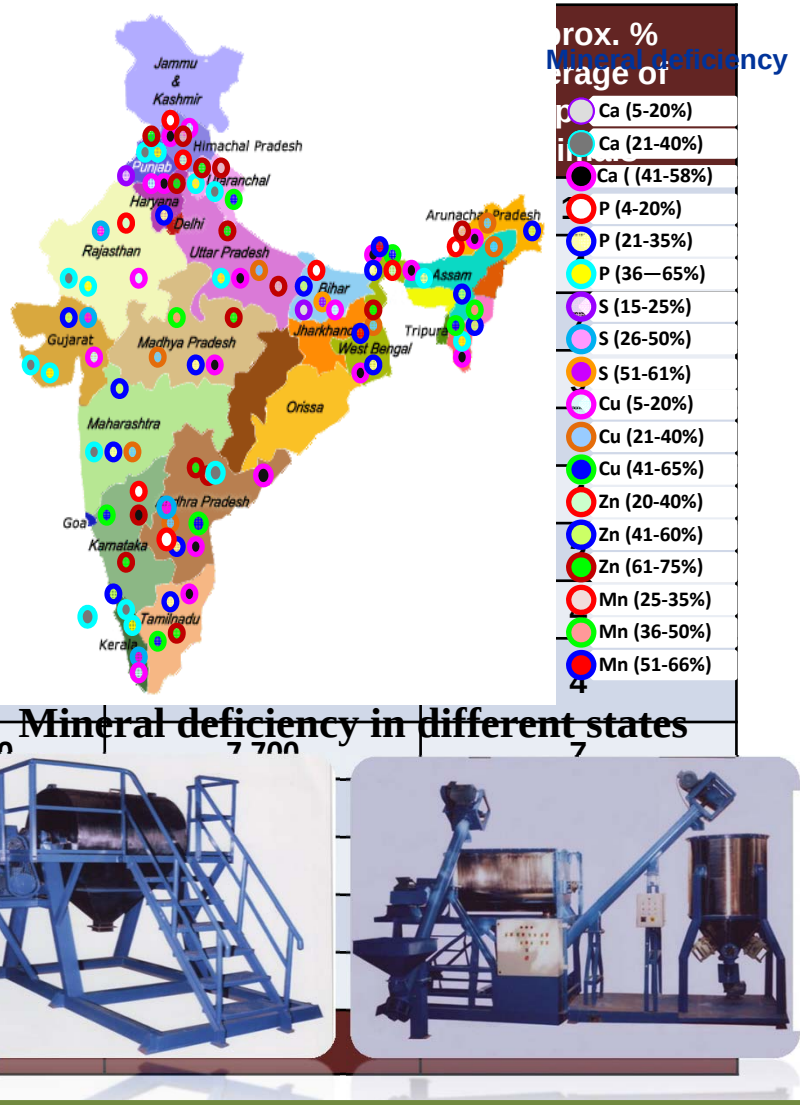
Improved efficiency of utilization of available feed resources

Compound cattle feed

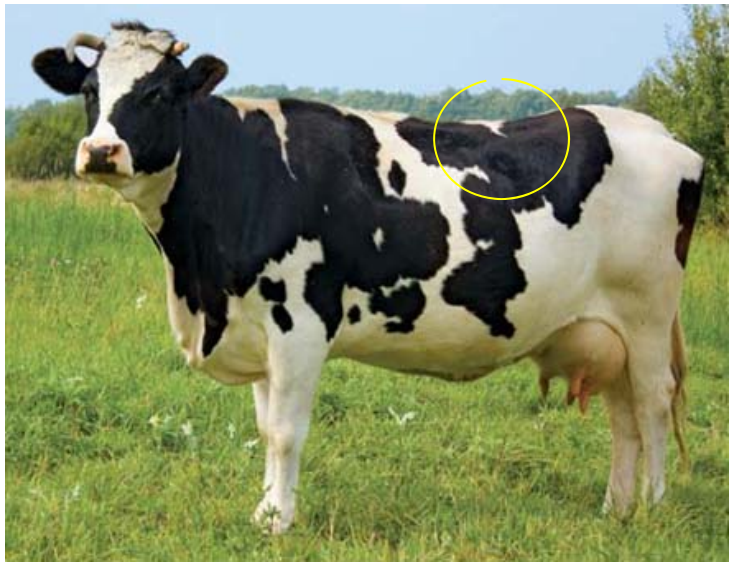
- **Presently, about 7.5 million tonnes of cattle feed in India, which is sufficient for just 8% of in-milk animals.**
- **Most of cattle feed plants are producing only one type of feed for catering different categories of animals.**
- **There is a need to produce**
  - **Calf starter for young calves**
  - **Feed for low yielding animals**
  - **Feed for dry pregnant animals**
  - **Feed for high yielding animals**
  - **Feed for buffaloes.**

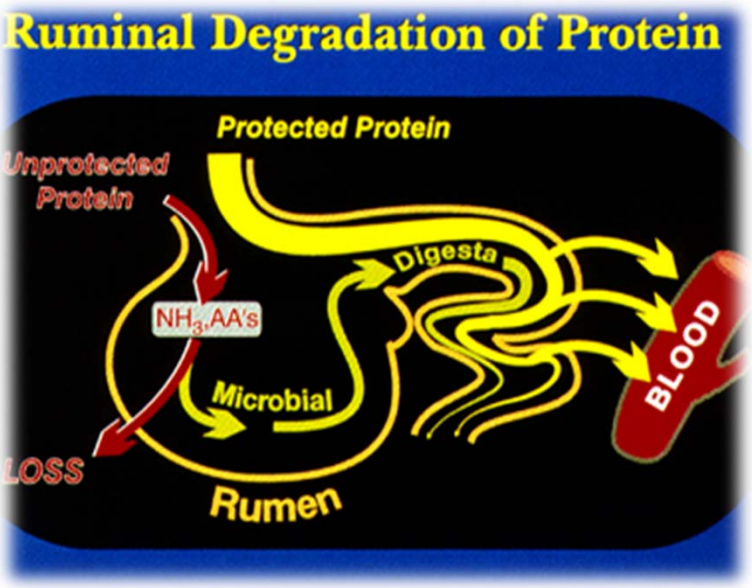
Area specific mineral mixtures

- Level of minerals in feeds & fodder varies from region to region.
- Area specific mineral mixtures need to be formulated for different agro-climatic zones, based on mineral mapping programme.
- NDDB/ICAR has completed mineral mapping programme & assisted dairy cooperatives in setting up 28 mineral mixture plants, each of 12 MT/day capacity.
- More plants are being set up in different parts of the country.



Bypass protein supplement for increasing milk production





- Presently, about 22 million tons of protein meals are available per annum, after excluding export of about 5 million tons.
- If suitable chemical treatment is given only to 5 million tons of protein meals (rapeseed, groundnut, sunflower), it should be possible to produce additional 5 million tons of milk.

Bypass fat supplement for lactating animals

- Energy density of the ration of high yielding animals is usually low.
- High yielding animals suffer heavy loss of body weight after calving.
- As a result, inter-calving period is prolonged & the lactation length & yield are reduced.
- Feeding bypass fat daily @ 100-150 g to animals 10 days pre-partum & 90 days postpartum helps improving milk production and reproduction efficiency.
- NDDB has set up a bypass fat plant at CFP, Katarva, Banaskantha for the production of bypass fat, using PFAD.

Securing crop residues from the surplus areas

Regional imbalances of crop residues

Enrichment & densification of crop residues in the form of blocks/pellets for easy transport & storage

State/central govt./ Dairy Coops need to work out a suitable mechanism

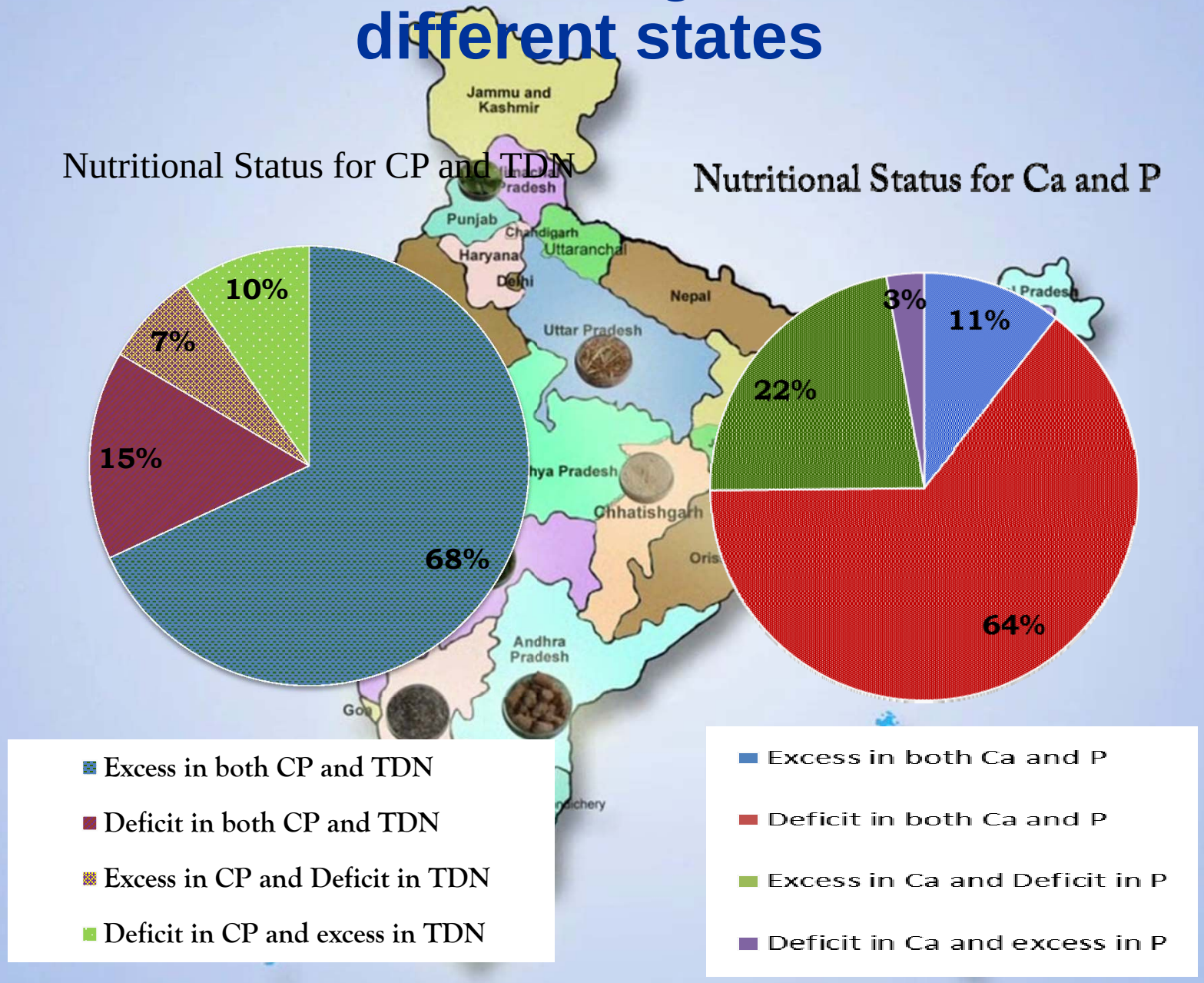
Burnt/wasted in areas of surplus

Considering the requirements, there should be advance planning for securing crop residues from the farmers field

Green fodder production enhancement & its conservation

- Green fodder production needs to be increased from the available land, by making certified fodder seeds available to farmers in time.
- At present, about 10% of the total area under fodder production is sown with certified fodder seeds.
- NDDB has assisted dairy coops in setting up 11 fodder seed processing plants. 7 more plants have been proposed under NDP-I.
- Presently, 5,500 MT quality fodder seeds are produced by the dairy cooperatives which would be increased to 13,000 MT by 2016-17.
- Demonstrations of high yielding varieties of fodder crops and fodder conservation practices in the form of silage, are being given.

Present status of feeding in-milk animals in different states



Development of ration balancing programme

Milk producers are advised to feed a balanced ration using locally available feed resources & area specific mineral mixtures

For this purpose, feed & fodder data library has been created.

Master for nutrient requirement for various categories of animals has also been created

Computer software has been developed to assess the nutrient status & for working out a least cost ration according to productivity & physiological status.

Software was pilot tested in various states before its large-scale use.

RBP: Implementation Plan

- Selection of End Implementing Agencies (EIAs).
- Identification/recruitment of qualified manpower with adequate experience.
- Training of Technical Officers & Trainers at NDDB.
- Selection of Local Resource Persons (LRPs) & their training
- Selection of villages, followed by organization of village awareness programme.
- Regular supply of area specific mineral mixture, cattle feed & other feed additives is ensured.
- RBP implementation by the LRPs.
- RBP monitoring at various levels.

Role of Local Resource Persons

- Identification of beneficiaries & selection of milch animals.
- Ear tagging for animal registration in INAPH.
- Recording body weight from the heart girth & the body length.
- Measurement of daily milk yield & collection of milk samples for fat analysis.
- Recording intake of each feed ingredient actually fed.
- Formulating least cost balanced ration with the available feed resources, in consultation with the milk producer.
- Providing least cost ration formulation in a prescribed format in local language.
- Advising milk producer to feed the balanced ration regularly.
- Re-visit after 3-4 weeks or whenever there is change in feed ingredients, to re-formulate a fresh ration.

Sustainability of Local Resource Persons

Items	Monthly sale (kg)	Commission @(Rs./kg)	Monthly income (Rs.)
Area specific mineral mixture	240	10	2400
Bypass fat/protein supplement(s)	50 bags	10/bag	500
Neutraceuticals, fodder seeds, dewormer feed pellets, Garbhamin Bolus etc.			500
Milk Replacer & Calf Starter	20 bags	10/bag	200
Charging from the beneficiaries	(for 80 animals)	@ Rs. 20 per animal/month	1600
Support from the DCS			500
Support from the union			500

Expected income could be Rs. 3000-5000 per month

Economic impact of RBP

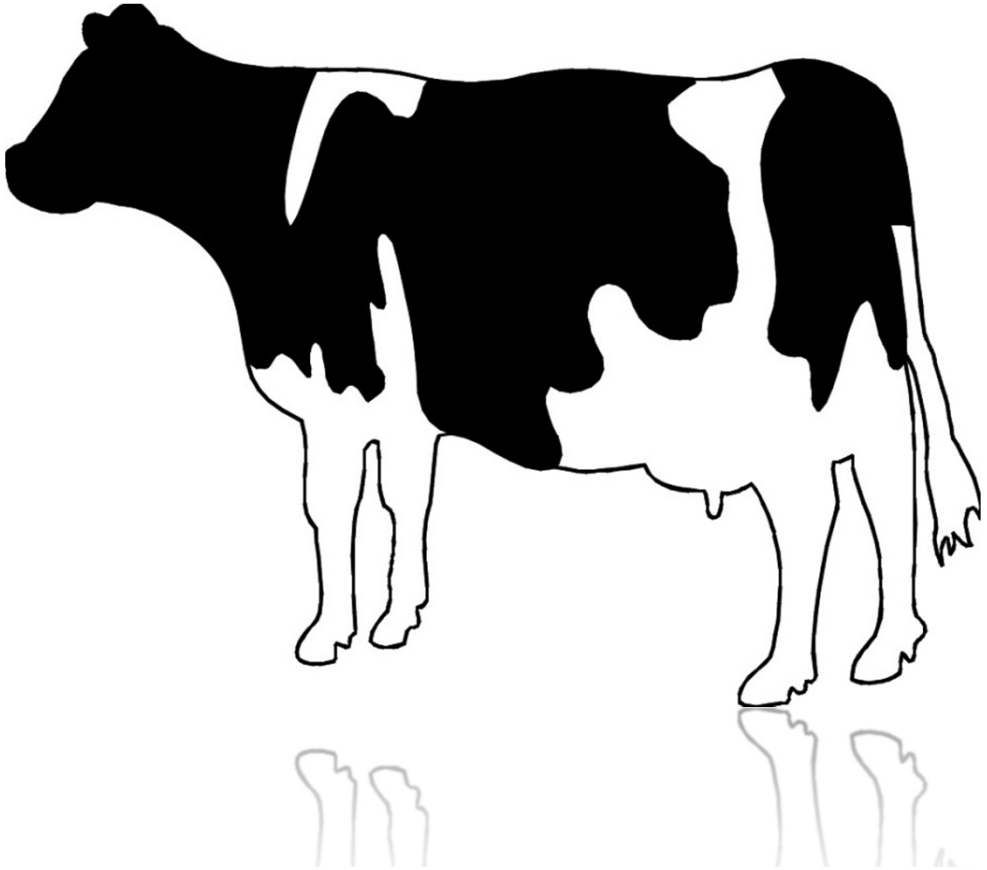
Parameter	Before RBP	After RBP	Change
Average milk production (kg/animal/day)	8.43	8.62	+0.19
Average fat % in milk	4.88	5.04	+0.16
Average cost of feeding (Rs./kg milk)	17.66	15.33	-2.33
Average cost of feeding (Rs./animal/day)	148.8	127.6	-21.20
Increase in net daily income (Rs./animal)			**28.0**

Problem of low SNF in milk

Imbalanced feeding:
- Energy deficiency
- Protein deficiency
- Mineral deficiency

Stress condition:
- Low feed intake
- Use of energy to combat stress

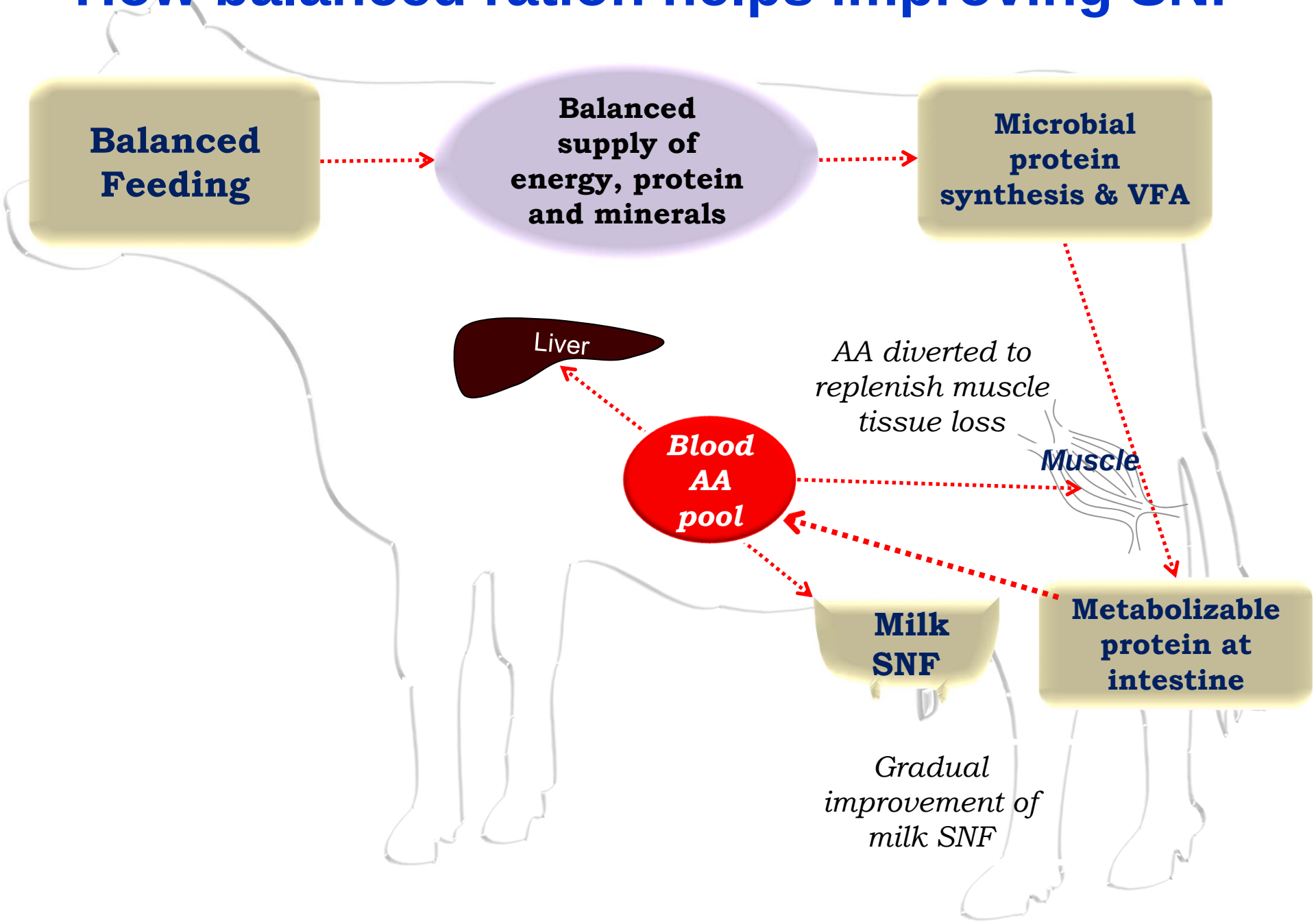
- Negative Energy Balance (NEB)
- Negative Protein Balance (NPB)



Disease condition
- Mastitis
- Metabolic disorders
- Other systemic diseases

Reduction in availability of milk precursors (amino acids), hence low SNF.

How balanced ration helps improving SNF



Effect of RBP on SNF

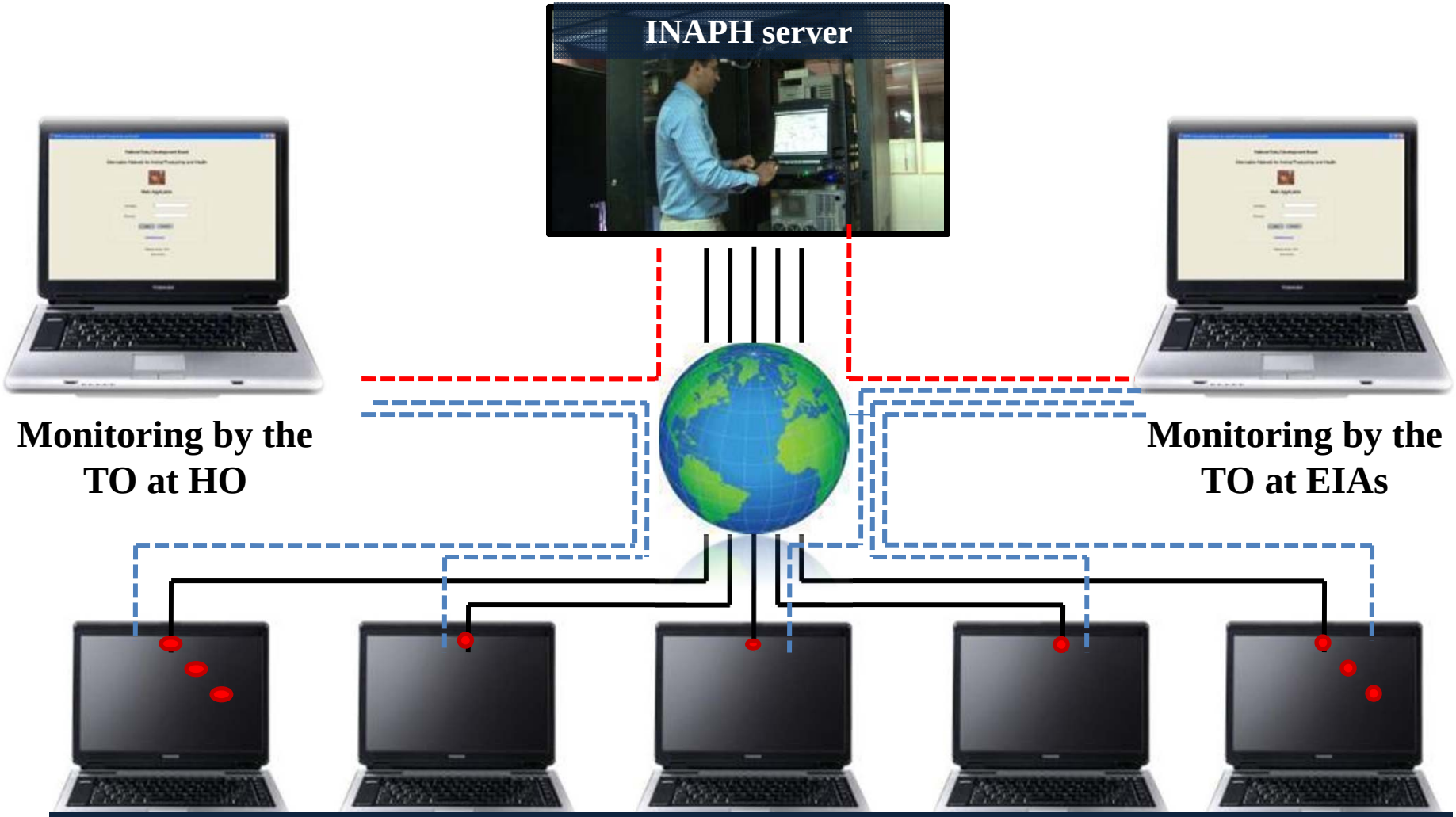
Parameter	Before RBP	After RBP	Change
Average milk production (kg/ani./day)	8.60	9.60	+1.00
Average fat % in milk	3.80	4.50	+0.70
Average cost of feeding (Rs./kg milk)	16.50	16.0	-0.50
Average SNF % in milk	**7.80**	**8.50**	**+0.70**

Other benefits of feeding a balanced ration

Parameters	Before RBP	After RBP
Methane emission (g/ kg milk yield)	29.65	24.05
Milk production efficiency(kg/kg DMI)	0.55	0.72
Dietary protein secreted into milk (%)	18.68	23.47
Serum IgG (mg/ ml)	13.10	22.32
BUN (mg/dl)	18.90	15.77
Fecal eggs per gram	184	77

Data Monitoring of RBP Implementation

Field data synchronized & stored in a central server can be monitored



Reports Generation for Future Planning