Mastitis Control Popularization Project

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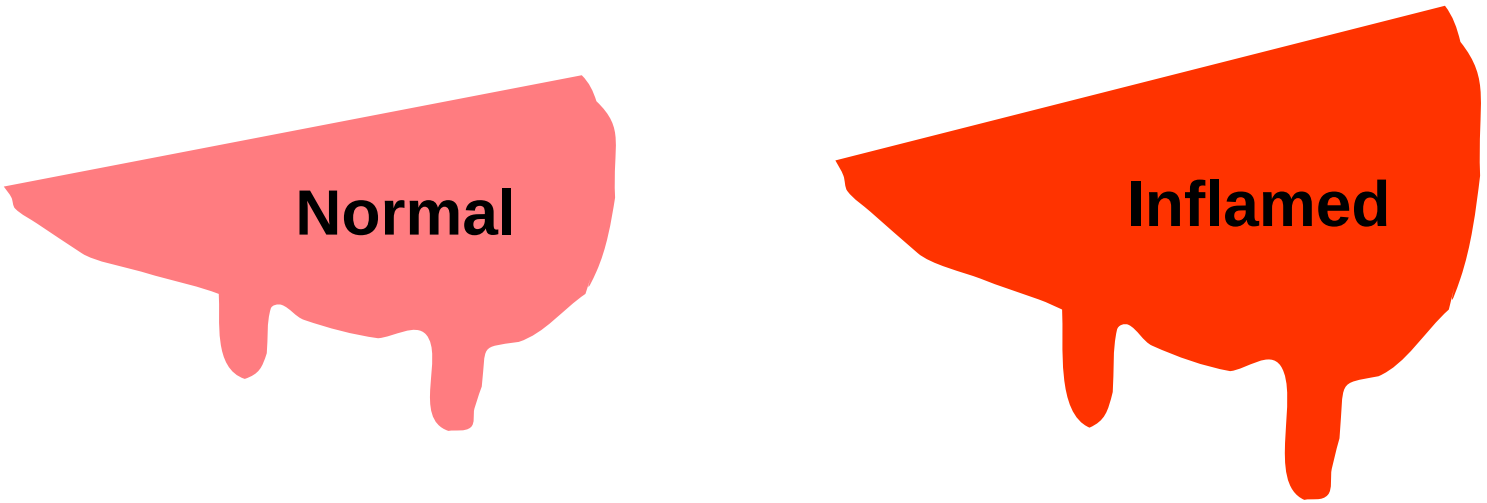
Outline of presentation

- Introduction
- Mastitis incidence and losses
- Challenges in mastitis control
- From concept to field : Pilot scale
- The Mastitis Control Popularization Project (MCPP)

What's mastitis ?

Inflammation of one or more quarters of the udder

- **Swelling**
- **pain**
- **warm**
- **redness**



Types of Mastitis

Subclinical Mastitis

- ~ 90-95% of all mastitis cases
- Udder appears normal
- Milk appears normal
- Elevated SCC
- Lowered milk output (~ 10%)
- Longer duration

Clinical Mastitis

- ~ 5 - 10% of all mastitis cases
- Inflamed udder
- Clumps and clots in milk
- **Acute type**
  - major type of clinical mastitis
  - bad milk
  - loss of appetite
  - depression
  - prompt attention needed
- **Chronic type**
  - bad milk

  cow appears healthy

What causes mastitis ?

Agents

- Bacteria (~ 70%)
  - *S. agalactiae*
  - Staph. aureus
  - *S. uberis*
  - *S. dysgalactiae*
  - *E. coli*
  - *Klebsiella spp.*
  - *Enterobacter*
  - *Corynebacterium pyogenes*
- Yeasts and molds (~ 2%)
- Unknown (~ 28%)
  - Physical trauma
  - Weather extreme

Where do these organisms come from ?

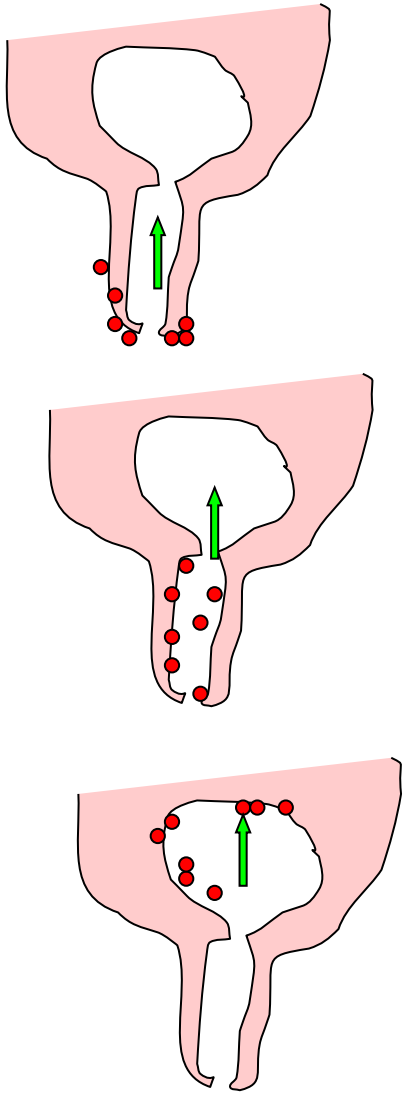
- Infected udder
- Environment
  - bedding
  - soil
  - water
  - manure
- Replacement animals

Process of infection

Organisms invade the udder through teat canal

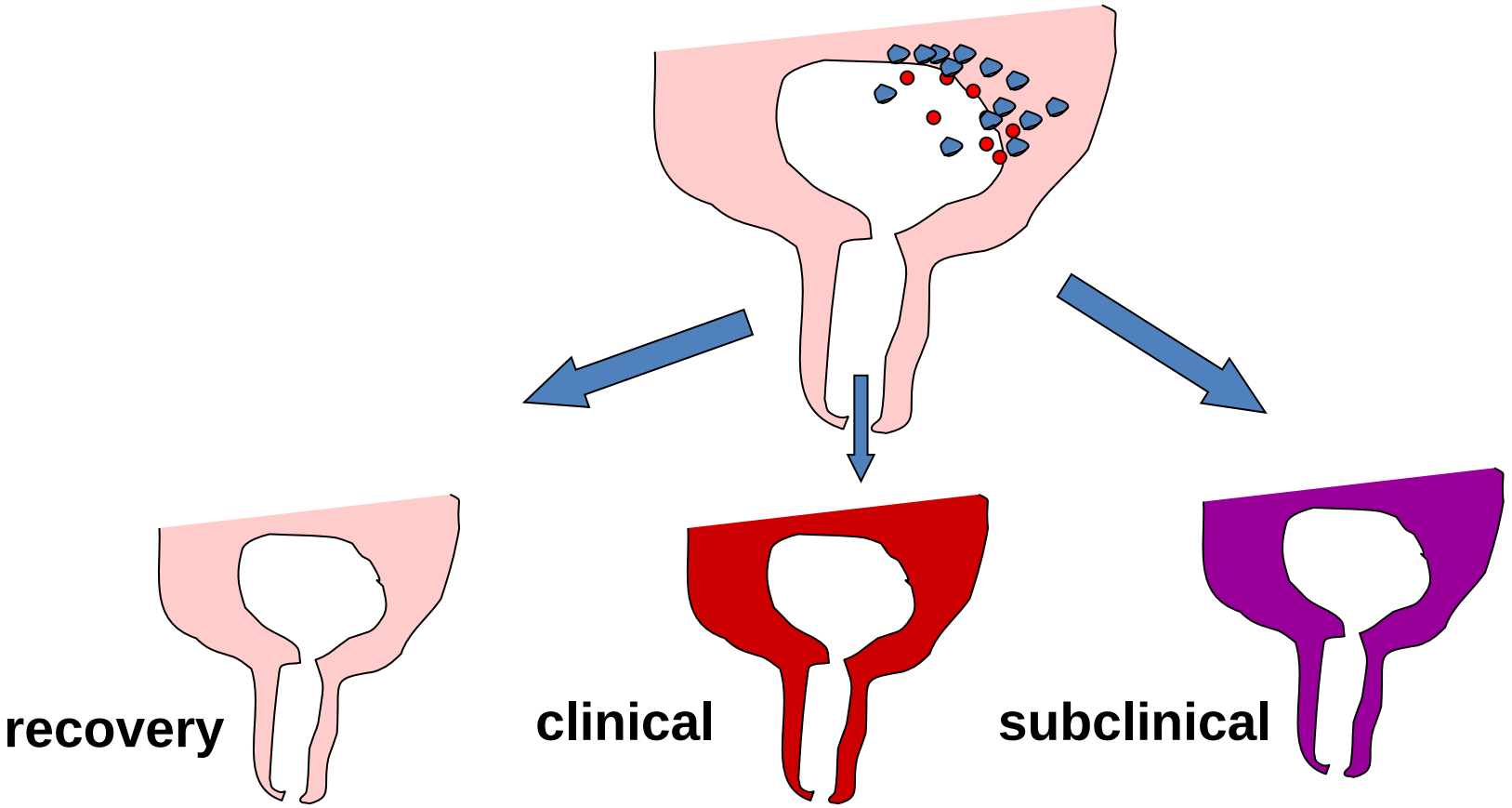
Migrate up the teat canal and colonize the secretory cells

Colonized organisms produce harmful substances to the milk producing cells



Response to infection

Immune system of the animal sends white blood cells (Somatic cells) to fight the organisms



How to diagnose mastitis?

- **Physical examination**
  - Signs of inflammation
  - Empty udder
  - Differences in firmness
  - Unbalanced quarters
- **Penside tests**
  - **California Mastitis Test**

Mastitis incidence in India

Prevalence of sub-clinical mastitis (SCM)

	Cattle	Buffalo
Field	16-79%	4-78%
Farms	10-78%	5-73%

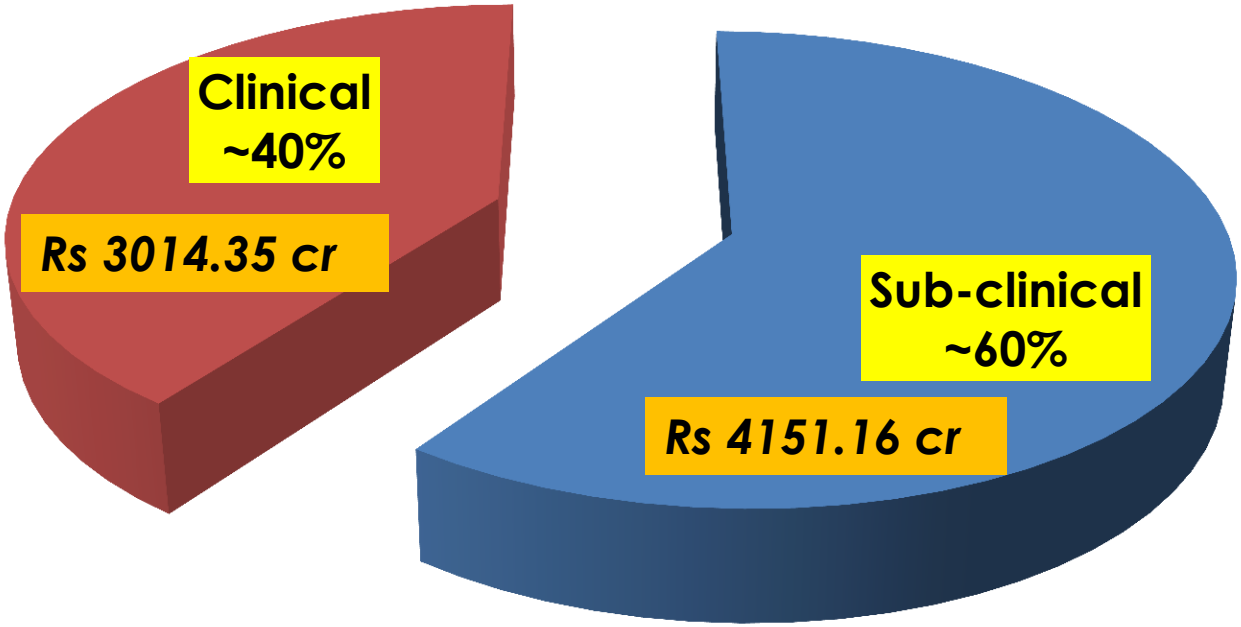
Prevalence of clinical mastitis (CM)

Cattle	Buffalo
0.4-30%	6-37%

Mastitis losses in India

Annual losses due to mastitis in India- Rs 7165.51 crores

(Bansal & Gupta, 2009)



Cost per litre of cow milk considered (Fat-3.5% , SNF-8%) – ***Rs.11.40***

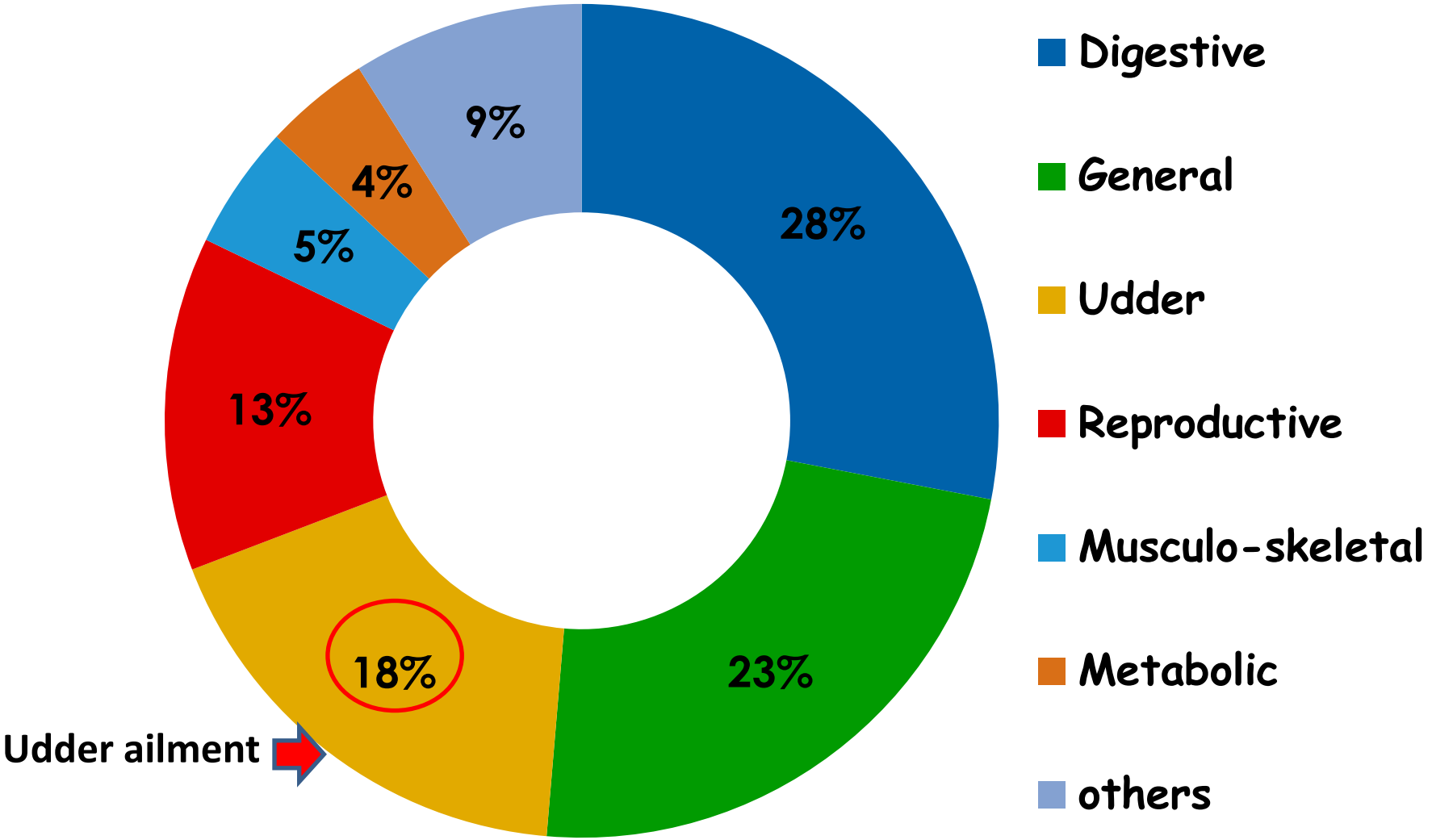
Cost per litre of buffalo milk considered (Fat-7% , SNF-8.8%) – ***Rs.16.80***

Challenges in mastitis control in India

- **Nature** of the disease
  - Most unaware of the sub-clinical form
  - Repeated visits required for treating clinical forms
  - Treatment unresponsive in most chronic forms/Antibiotic resistance
- A **large** population of cattle and buffaloes in milk.
- **Thin** distribution of animals /Several systems of management
- **~85%** of bovines are with landless, marginal and small farmers.
  - Treatment costs are **prohibitive** to the majority of farmers
- **No** national programme on mastitis control in India
- Antibiotic residues in milk and milk products – No incentives / disincentives.

NDDB's intervention for detection of sub-clinical mastitis and control in Sabarkantha

Major disease classes recorded in Sabarkantha Milk Union by INAPH



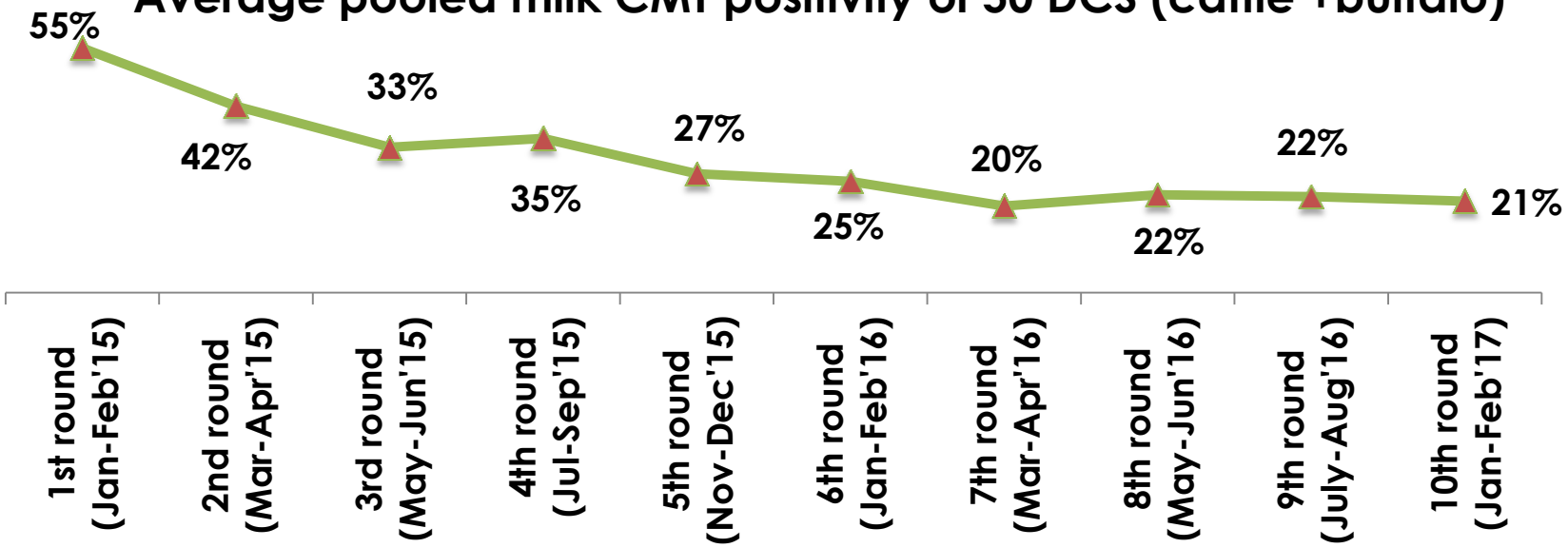
Data recorded for 2.5 years in ~ 4.5 lakhs animal treatment records

Three – pronged approach

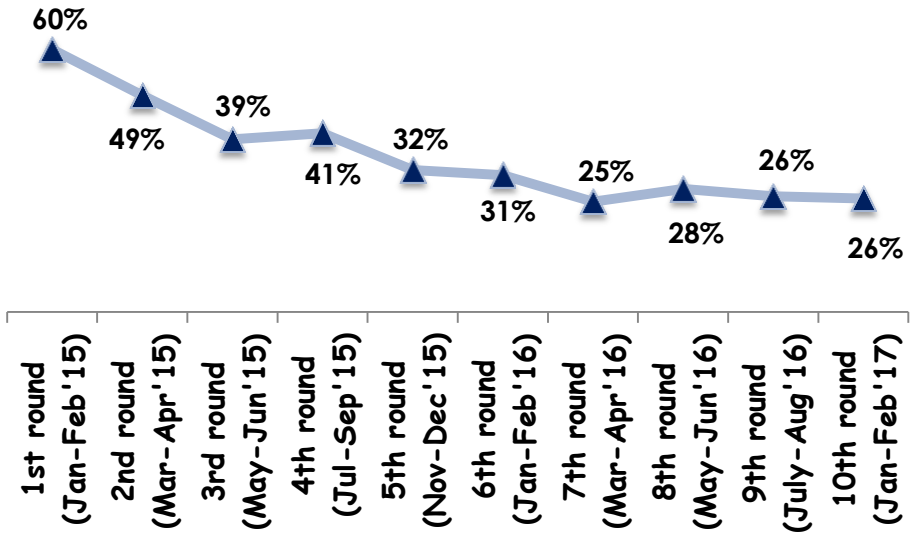
Detection and control of SCM	• Awareness creation • CMT testing at DCS and farmer level • Tri sodium citrate oral regimen to CMT positive animals
Rationalizing antibiotic usage	• Field antibiotic sensitivity kits • Ethno-Veterinary medicine (EVM) for mastitis cases • EVM knowledge transfer to farmers
Management of chronically infected animals	• Identification of chronically infected animals • Management advisory to farmer • Dry cow therapy

Outcomes of intervention

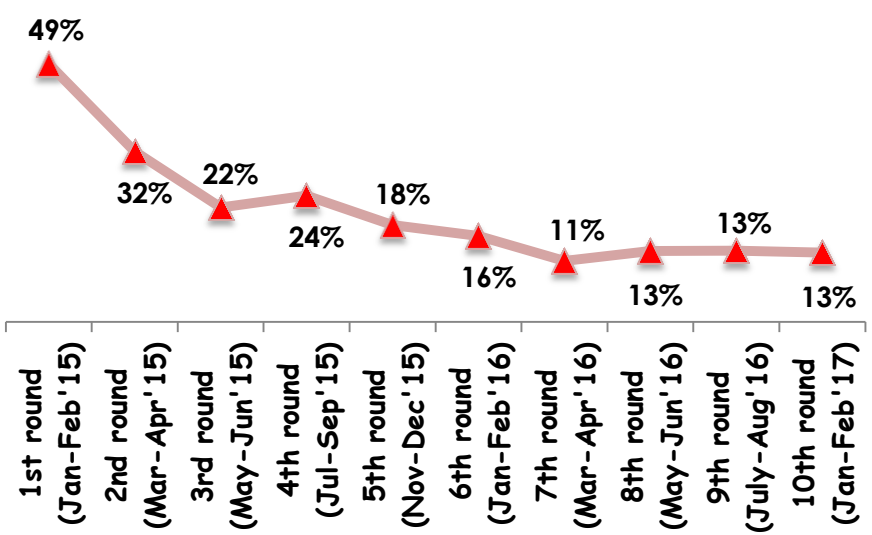
Average pooled milk CMT positivity of 50 DCS (cattle +buffalo)



Avg. CMT positivity of pooled cattle milk

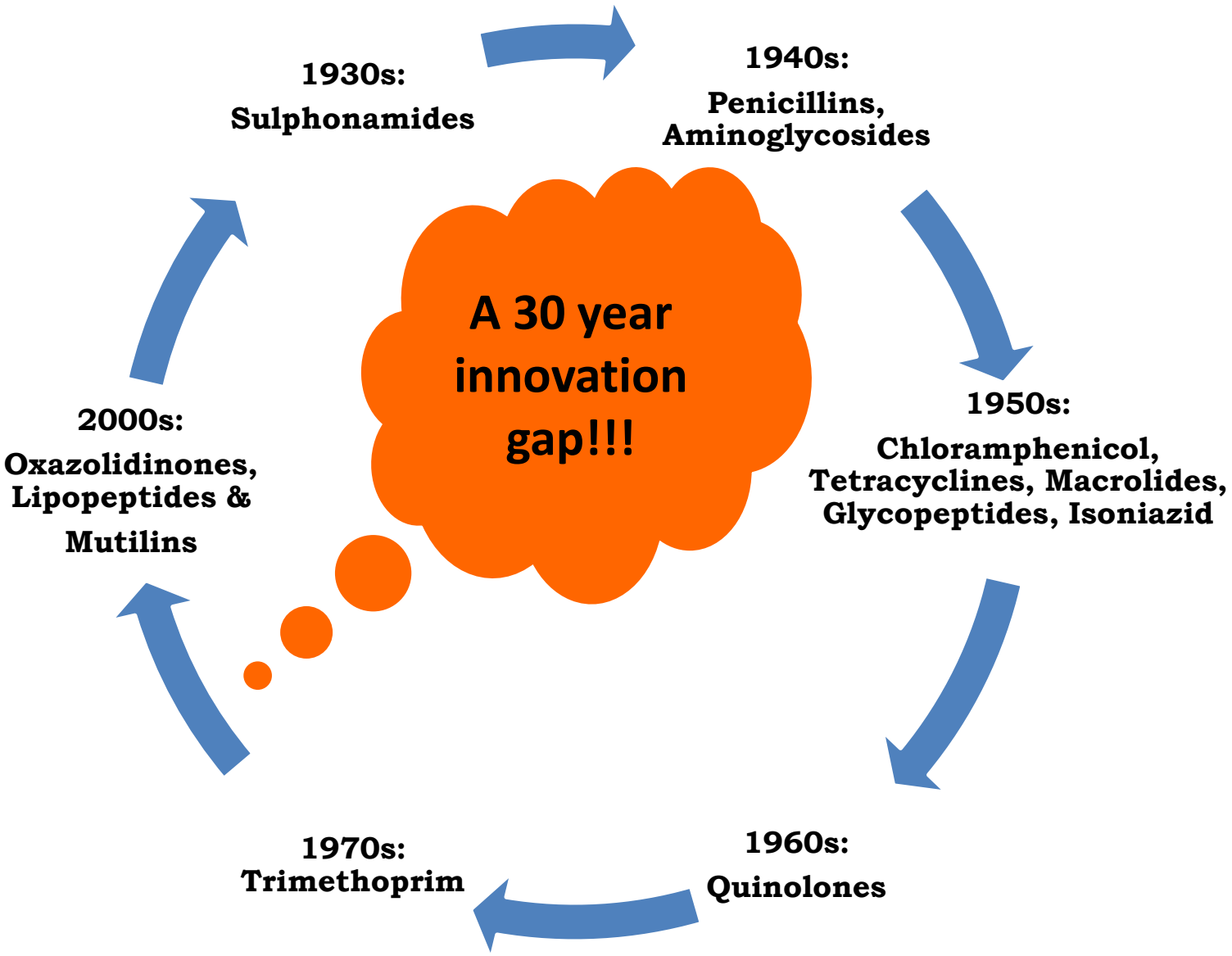


Avg. CMT positivity of pooled buffalo milk

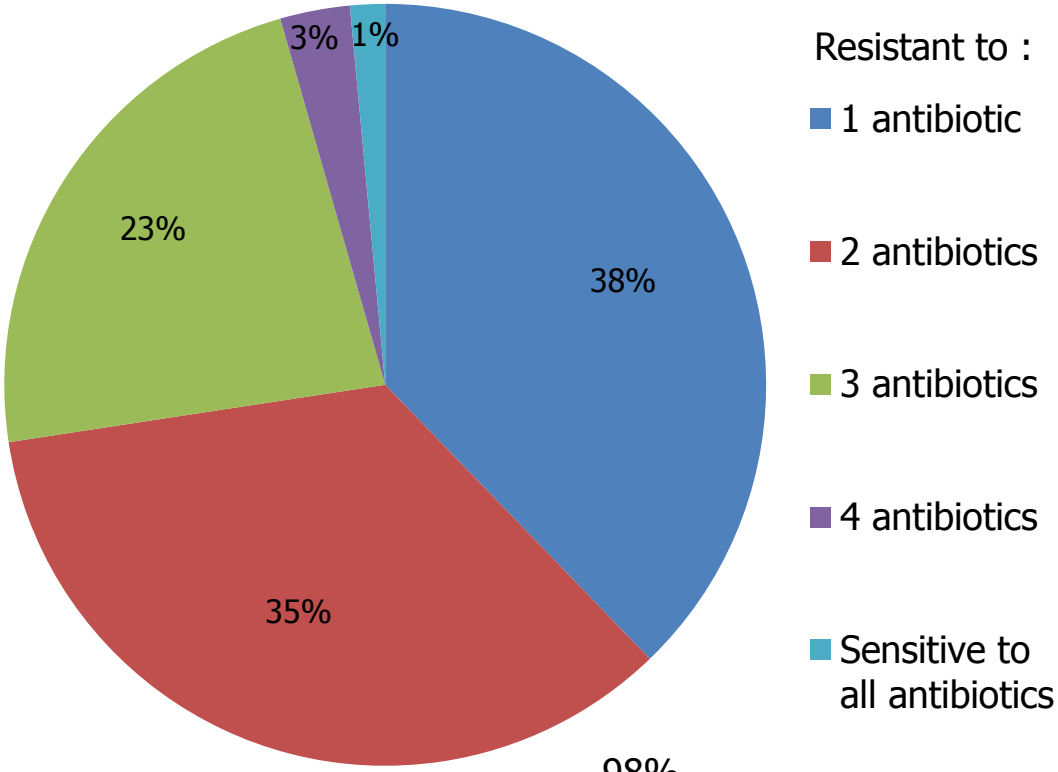


Rationalizing antibiotic usage / Ethno Veterinary Medicine (EVM)

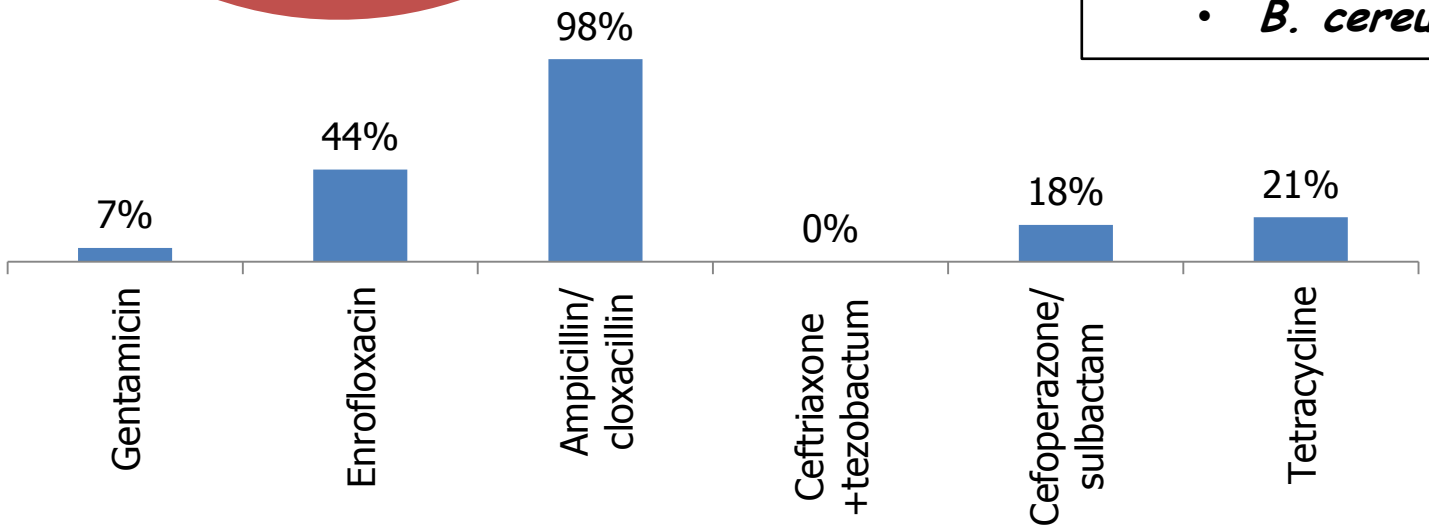
Antibiotic milestones / Antimicrobial resistance



ABR pattern from clinical mastitis



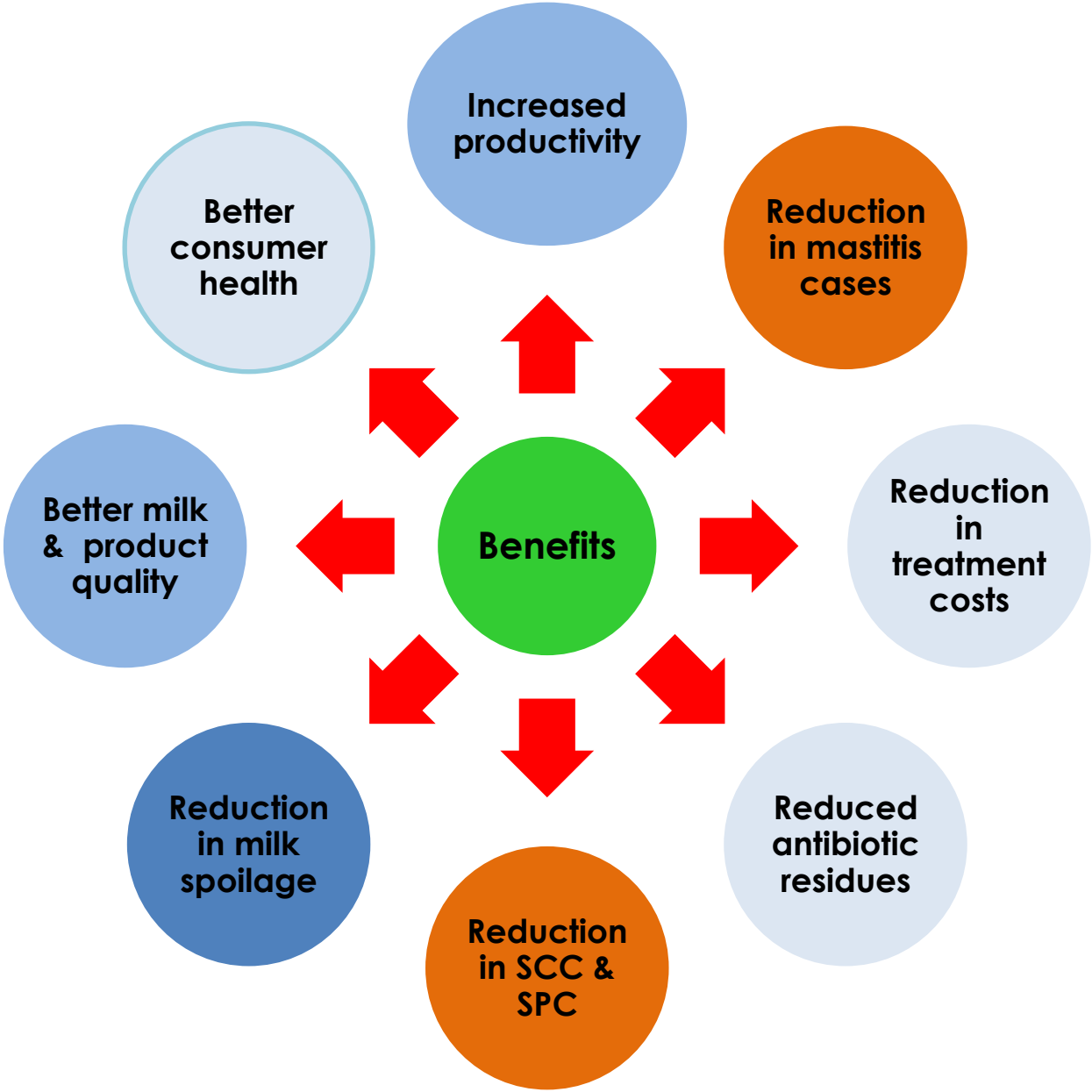
- **47 CM cases from 23 villages**
- **135 isolates**
- **11 types of bacteria:**
  - ***S. aureus***
  - ***Strep agalactiae***
  - ***Enterobacter.***
  - ***E. coli***
  - ***Klebsiella***
  - ***Strep. dysgalactiae***
  - ***S. intermedius***
  - ***S. epidermidis***
  - ***Strep. enterofaecalis***
  - ***B. subtilis***
  - ***B. cereus***



The EVM experiment at Sabarkantha

- More than 6000 cases of mastitis have been treated with ~92% success through EVM alone (no antibiotics used)
- More than 5000 aloevera plants have been distributed to the farmers.
- A demo plot has been established at the dairy premises.
- Dry cow therapy follow-up : in around 88% animals no mastitis in subsequent lactation

A win-win situation!!



The way forward :

- **Popularization of the control concept**
  - The States of Gujarat, Punjab, Maharashtra, Goa, Karnataka, Tamilnadu, Andhra Pradesh, Telangana and Kerala are being covered.
- **Training** on EVM on a mass scale.
- Creation of **a core group** at milk Union level to propagate EVM.
- Creation of **medicinal plots** at dairy plant /milk society level for providing farmers with the required plants.
- **Capacity building** for monitoring the levels of antibiotic residues in milk in Project areas .
- Creation of a **feasible model** that generates the interest for a national level programme.

The Mastitis Control Popularization Project (MCPP)

The Project has five key components :

1. Training and extension
2. Mastitis detection and control
3. Monitoring
4. Impact analysis
5. Reporting

MCPP

Training and extension

- Orientation of core group on the control model and Ethno Veterinary Medicine (EVM).
- Training of other veterinarians and DCS staff of the MCPP area.
- Setting up a demo medicinal plot.
- Extension material for Dairy Cooperative Societies (DCS).
- Continued extension on animal and shed hygiene, pre and post milking procedures, hygienic milking practices for hand and machine milking, balanced feeding, mineral supplementation, bovine comfort and manure management.

MCPP

Mastitis detection and control

- Detection and control of sub-clinical mastitis at DCS
  - California Mastitis Test (CMT) testing at DCS and farmers' homestead.
  - Oral administration regimen of Trisodium citrate
- Rationalizing antibiotic usage :
  - Use of EVM in treatment of clinical /chronic mastitis cases.
  - Use of antibiotic sensitivity kits
  - Dry cow therapy

MCPP

Monitoring

A reduction in antibiotic residues in the bulk milk samples of the DCS in MCPP areas is expected by end of Project period.

The bulk milk samples of the DCS will be tested for antibiotic residues using the field antibiotic sensitivity kits at the following frequency:

- First year – 4 bulk milk samples from DCS under the MCPP on a quarterly basis.
- The sample collected in the first quarter (before initiation of the Project) would be considered as baseline.
- Second year – 2 bulk milk samples on a half yearly basis.

MCPP

Impact Analysis

- Farmer awareness
  - 10% of DCSs covered under MCPP will be identified .
  - 20 farmers from each of the selected DCSs will be surveyed.
  - The surveys would be done at the beginning (baseline) and end of the Project
- Bulk milk CMT positivity .
  - Avg. bulk milk CMT positivity % of each of the DCS under the MCPP, the first report being the baseline.
  - Periodic monitoring
- Antibiotic residues in milk
  - The first report would be the baseline.

MCPP

Reporting

The following parameters are to be reported on a periodic basis to NDDB:

- Average SCM of the DCSs as determined by CMT.
- No. of clinical mastitis cases.
- No. of animals treated for mastitis by EVM.
- No. of animals that recovered by EVM therapy.
- No. of veterinarians trained in EVM.
- Antibiotic residue test results.

Components of NDDB grant

S.no	Components	Details
1	Training of core group veterinarians on ethnoveterinary medicine (EVM) and control model at TDU*, Bangalore (@Rs.20000/vet limited to a maximum of 5 vets per union)	Training fees (inclusive of boarding and lodging) and field visits.
2	Antibiotic residue kits for field use	Field kit costs
3	Extension and reporting	Village awareness camps, posters at DCS
4	Farmer surveys (Baseline and end of Project)	20 farmers each in 10% of the DCS under the Project
		Grand total

* An agreement has been signed by NDDB with Trans Disciplinary University (TDU) for this.
^ A rate contract has been made by NDDB with the company
# Limited to actuals or Rs.30,000/- whichever is less.

MCPP: Implementation commenced

S.no	Name of the Milk Union/Producer Company	State	No.of milk societies covered	No.of pourers covered	No.of in-milk bovines covered
1	Bangalore Milk Union	Karnataka	200	12,000	15,000
2	Chamrajnagar Milk Union	Karnataka	50	2,500	2,500
3	Shimoga Milk Union	Karnataka	50	3,000	3,000
4	Kolar Milk Union	Karnataka	100	5,000	8,000
5	Mysore Milk Union	Karnataka	50	2,500	2,500
6	Tumkur Milk Union	Karnataka	50	2,500	2,500
7	Coimbatore Milk Union	Tamil Nadu	50	2,500	2,500
8	Erode Milk Union	Tamil Nadu	50	2,500	2,500
9	Salem Milk Union	Tamil Nadu	50	2,500	2,500
10	Krishna Milk Union (PC)	Andhra Pradesh	50	2,500	2,500
11	Nalgonda Ranga Reddy (PC)	Telangana	50	2,000	3,000
12	Kolhapur Milk Union	Maharashtra	50	4,050	8,100
13	Aurangabad Milk Union	Maharashtra	50	1,500	1,500
14	Pune Milk Union	Maharashtra	50	1,250	3,000
15	Rajaram Bapu Milk Union	Maharashtra	150	15,000	15,000
16	Warana Milk Union	Maharashtra	40	2,000	3,200
17	Baramati Milk Union	Maharashtra	50	2,500	5,000
18	Ahmednagar Milk Union	Maharashtra	50	1,250	2,500
19	Mehsana Milk Union	Gujarat	50	12,500	50,000
20	Sabarkantha Milk Union*	Gujarat	100	15,000	40,000
	*Pilot project	**Total**	**1,340**	**94,550**	**1,74,800**

Thank you for your kind attention