



Experiences and Results from Herbal Mastitis Control in Indian Smallholder Dairy

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Presentation overview



- Brief about NDDB
- Dairying in India
- Mastitis in the Indian Context
- A field approach to mastitis control
- NDDB's experience
 - Mastitis Control
 - Ethno-Veterinary medicine (EVM)
- Popularisation measures
- Way forward
- Acknowledgements



Brief about NDDB

National Dairy Development Board

Registered as society in September 1965, declared as an Institute of National Importance in 1987 by an Act of Parliament

Objectives:

- To promote Anand Model of Cooperatives across the country
- To promote, finance and support producer-owned and controlled organizations
- To strengthen farmer cooperatives and support national policies that are favorable to the growth of such institutions



Brief about NDDB

The Anand pattern



15.4 million milk producers

165,835 village dairy cooperative societies

Local sales, sale of cattle feed, testing of milk, payment



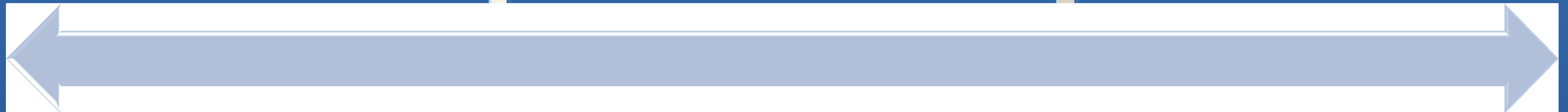
210 district milk unions

Collects and processes milk, operates processing plants, provides inputs - health, breeding and cattle feed



25 State milk federations

Markets milk & milk products, coordinates inter-state sales





Operation Flood and other programmes by NDDB

- ❑ Operation Flood (1970-1996): the dairy development programme undertaken by NDDB, made India self sufficient in milk and brought lasting changes in the socio-economic development of millions of small and marginal farmers involved in dairying business.

“A twenty-year experiment confirming the Rural Development Vision” : World Bank Report 1997c.

- ❑ Perspective plan

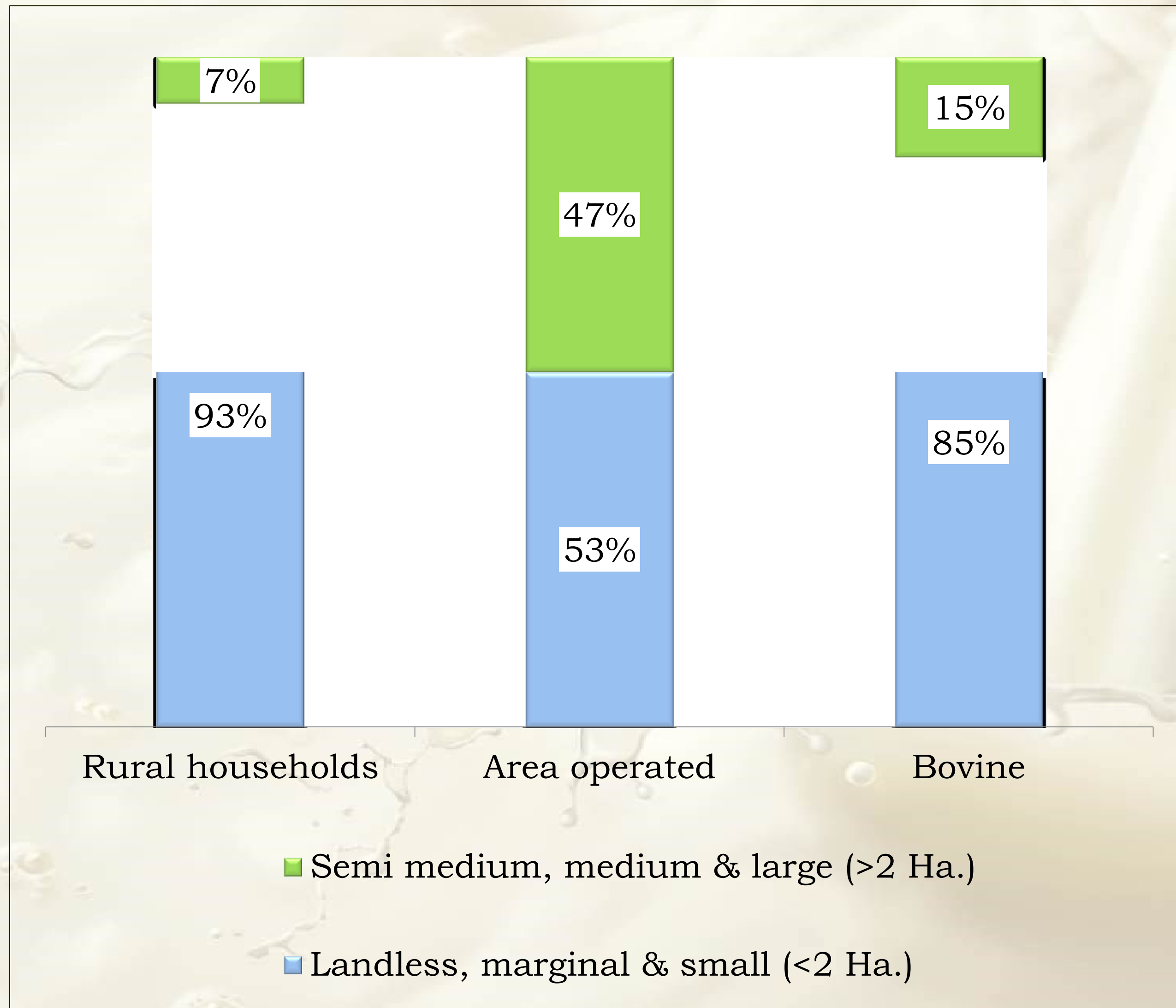
- ❑ National Dairy Plan : 2011-12 to 2018-19

Year	1970	1996	2018-19
Milk production in Million MT	21.2	66.2	187.7

Dairying in India

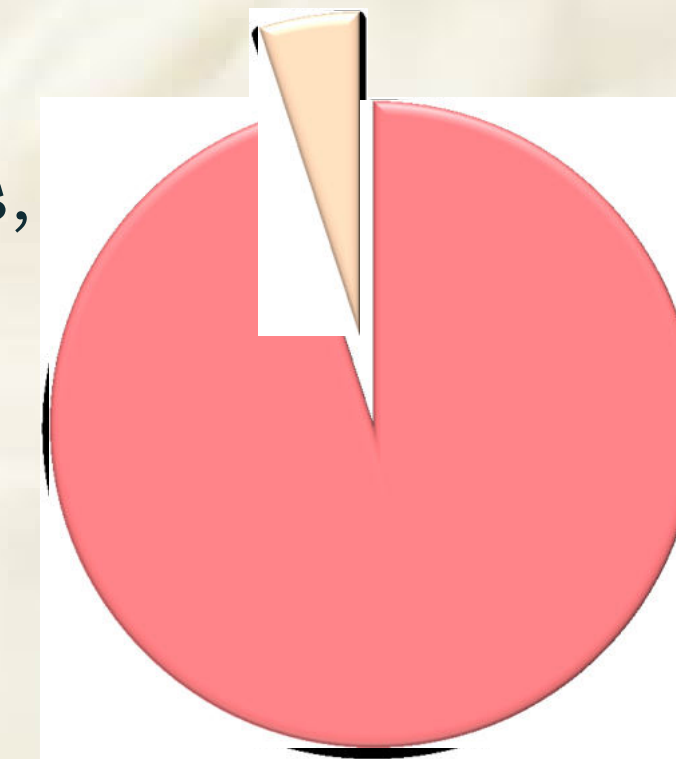


Animal Holding and Herd Size



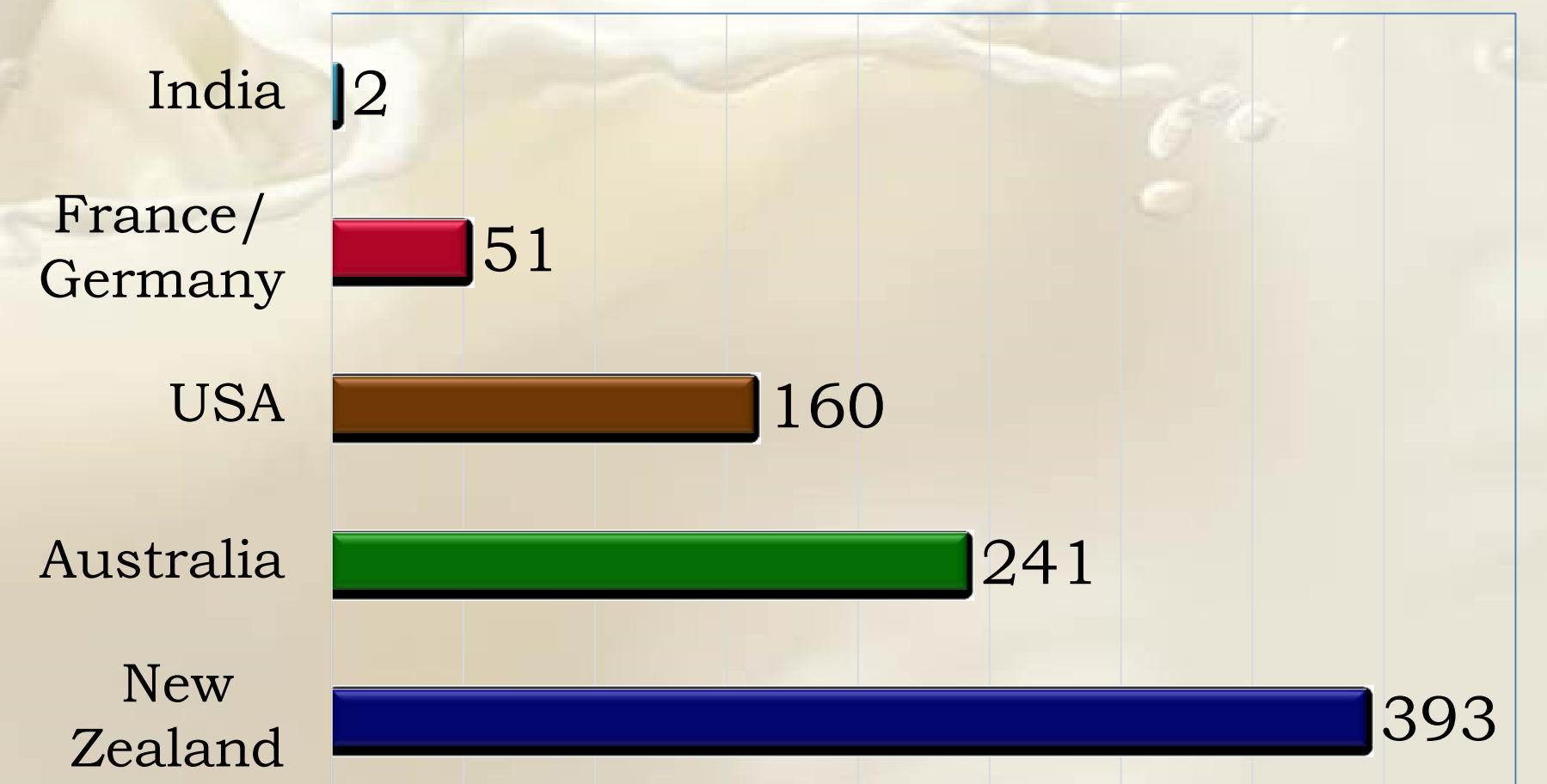
Herd size of milk producers in India

More than 5 animals, 5%



1 to 5 animals, 95%

Herd size per holding

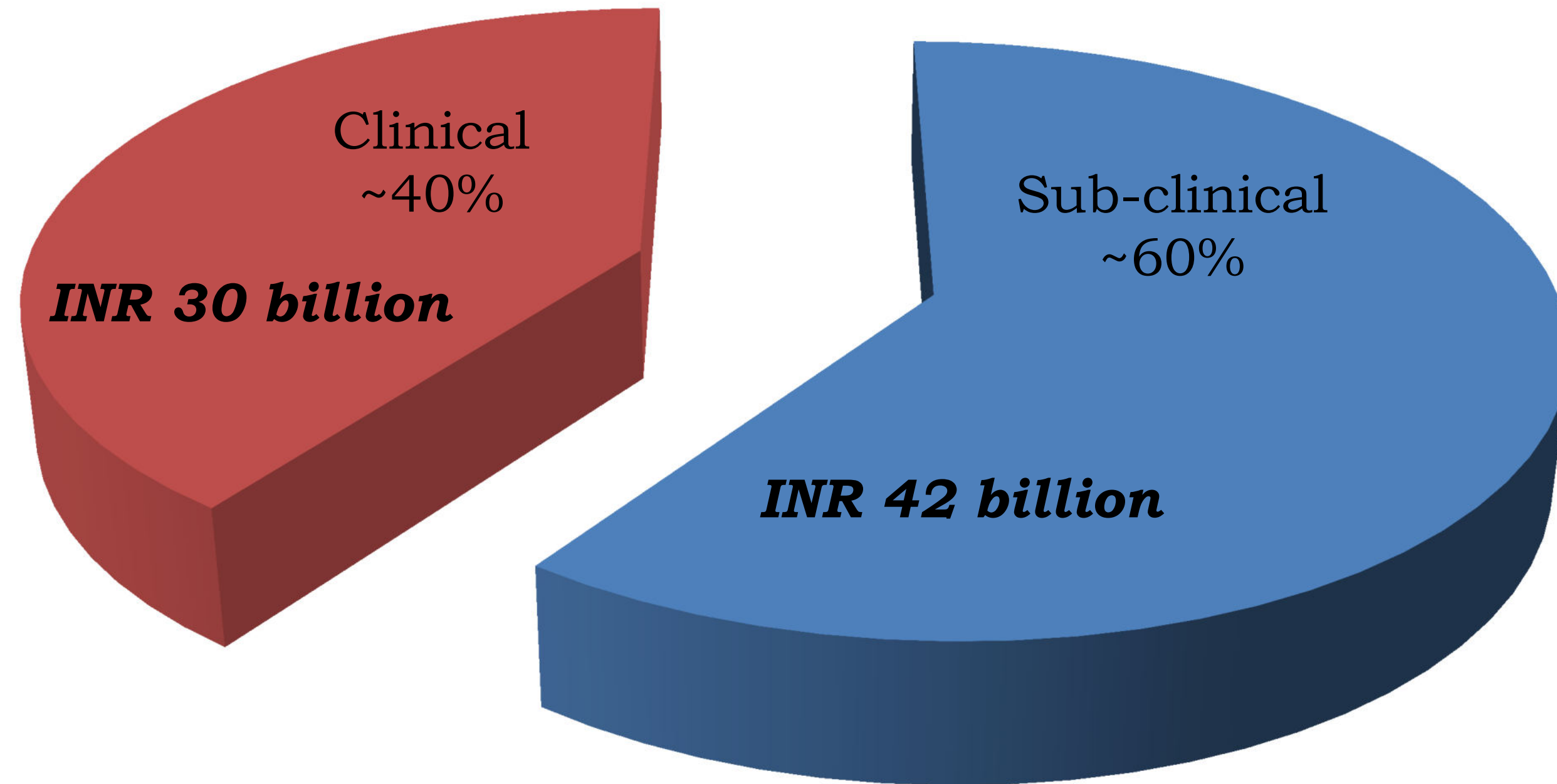




Mastitis in the Indian context

Annual losses

INR 72 billion (*Bansal & Gupta, 2009*)



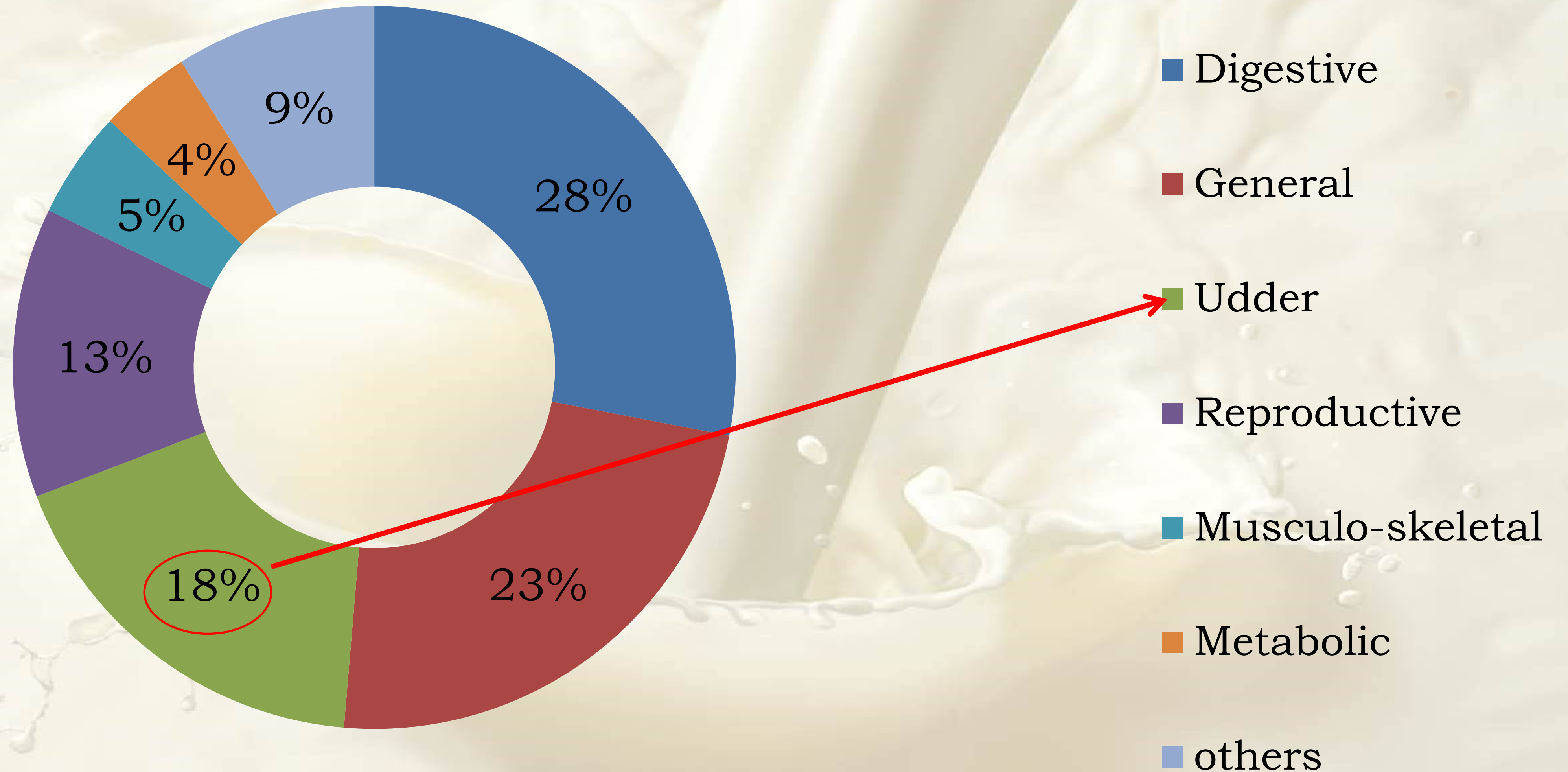
Cost per litre of cow milk considered (Fat-3.5% , SNF-8%) – **Rs.11.40**

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



Mastitis in the Indian context

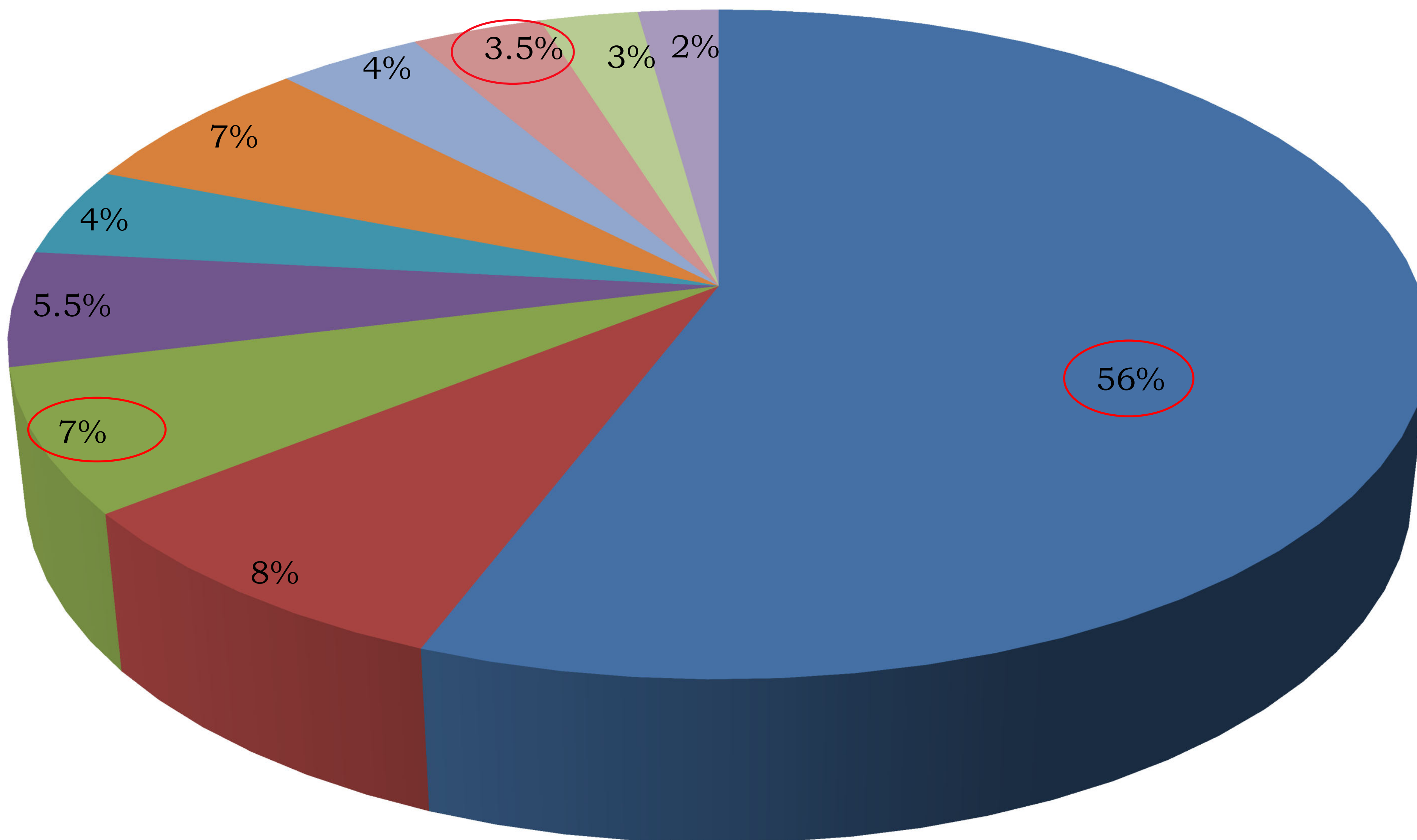
Disease trends as per INAPH*



*Information Network for Animal Productivity and Health – A national database for livestock

Mastitis in the Indian context

Udder condition trends recorded



- Clinical Mastitis
- Blood in Milk
- Chronic Mastitis
- Agalactia
- Impetigo
- Other Udder diseases
- Fibrosis
- Subclinical Mastitis
- Mammilitis
- Teat Obstruction



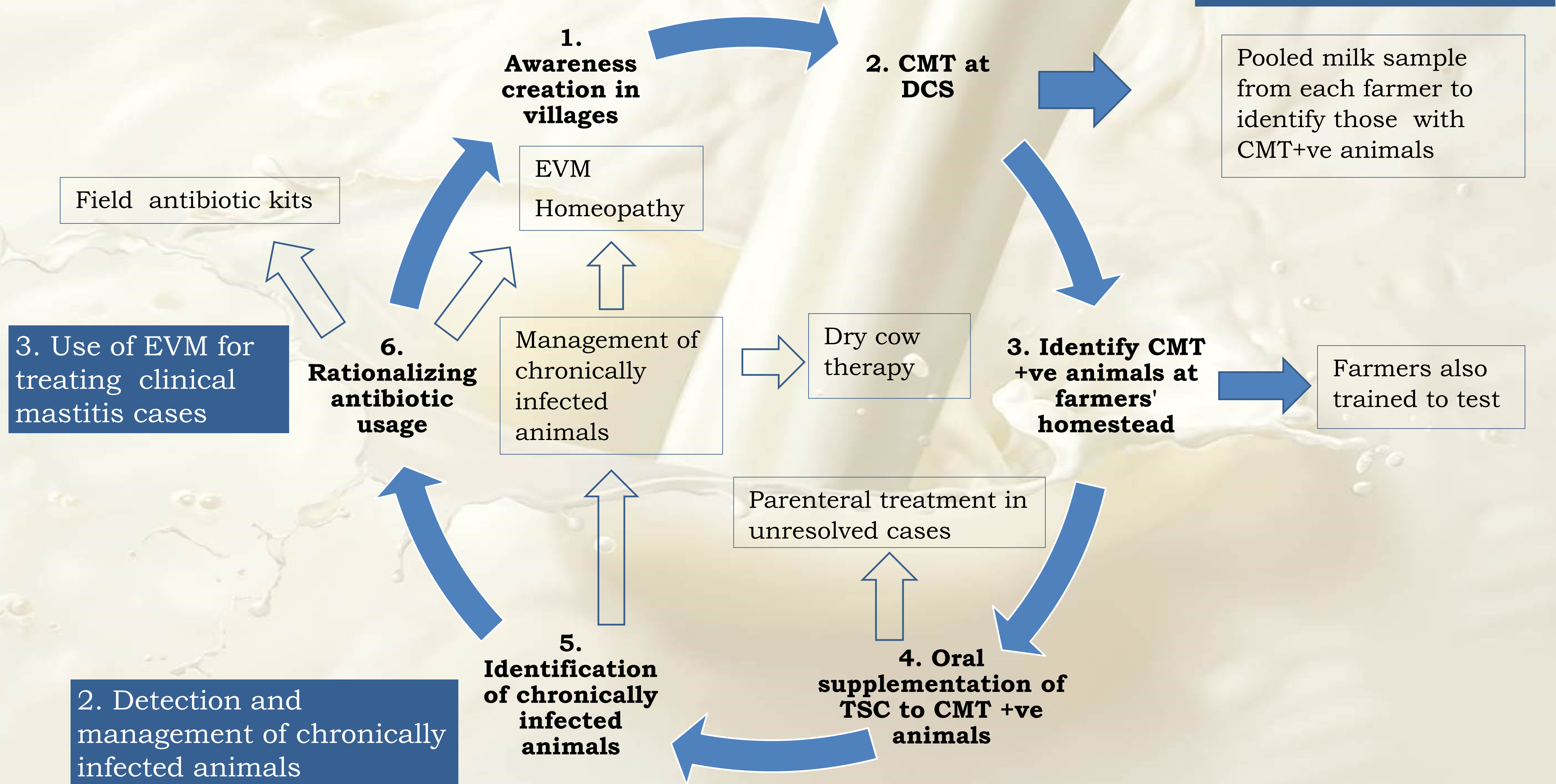
Challenges in mastitis control

- **Nature** of the disease:
 - Most unaware of the sub-clinical form
 - Repeated visits required for treating clinical forms
 - Treatment unresponsive in most chronic forms
- A **large** population of in-milk cattle and buffalo (~90 million)
- **Thin** distribution of animals and **myriad** management systems
 - Only ~**5** % of milk producers have a herd size of >**5** milch animals
- ~**85%** of bovines are with landless, marginal and small farmers.
 - Treatment costs **prohibitive** to the majority of farmers
- **No** national programme on mastitis control in India
- Antibiotic resistance
- Antibiotic residues in milk and milk products – No incentives/disincentives

Field approach in mastitis control



The Concept



Field approach in mastitis control



Core components

Awareness creation



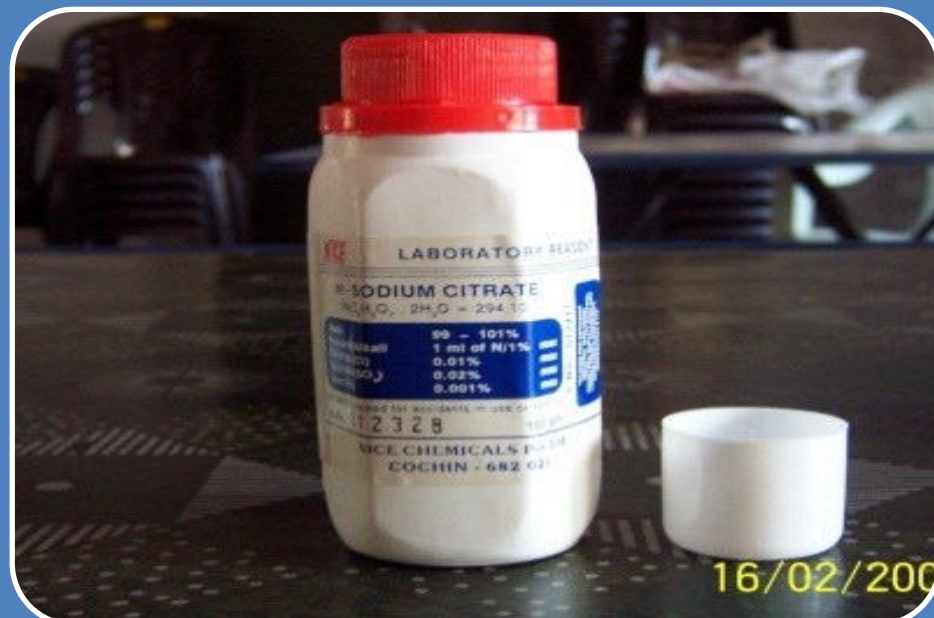
- Village meetings
- Extension material- calendars, posters, stick-ups, individual farmer meetings etc
- Seminars

Identification of CMT positives



- Bulk milk CMT of pooled cow & buff milk at DCS
- Individual animal CMT testing at farmers' homestead if bulk milk CMT positive
- Regular cycles of testing at DCS and individual animal level

Treatment of CMT positives

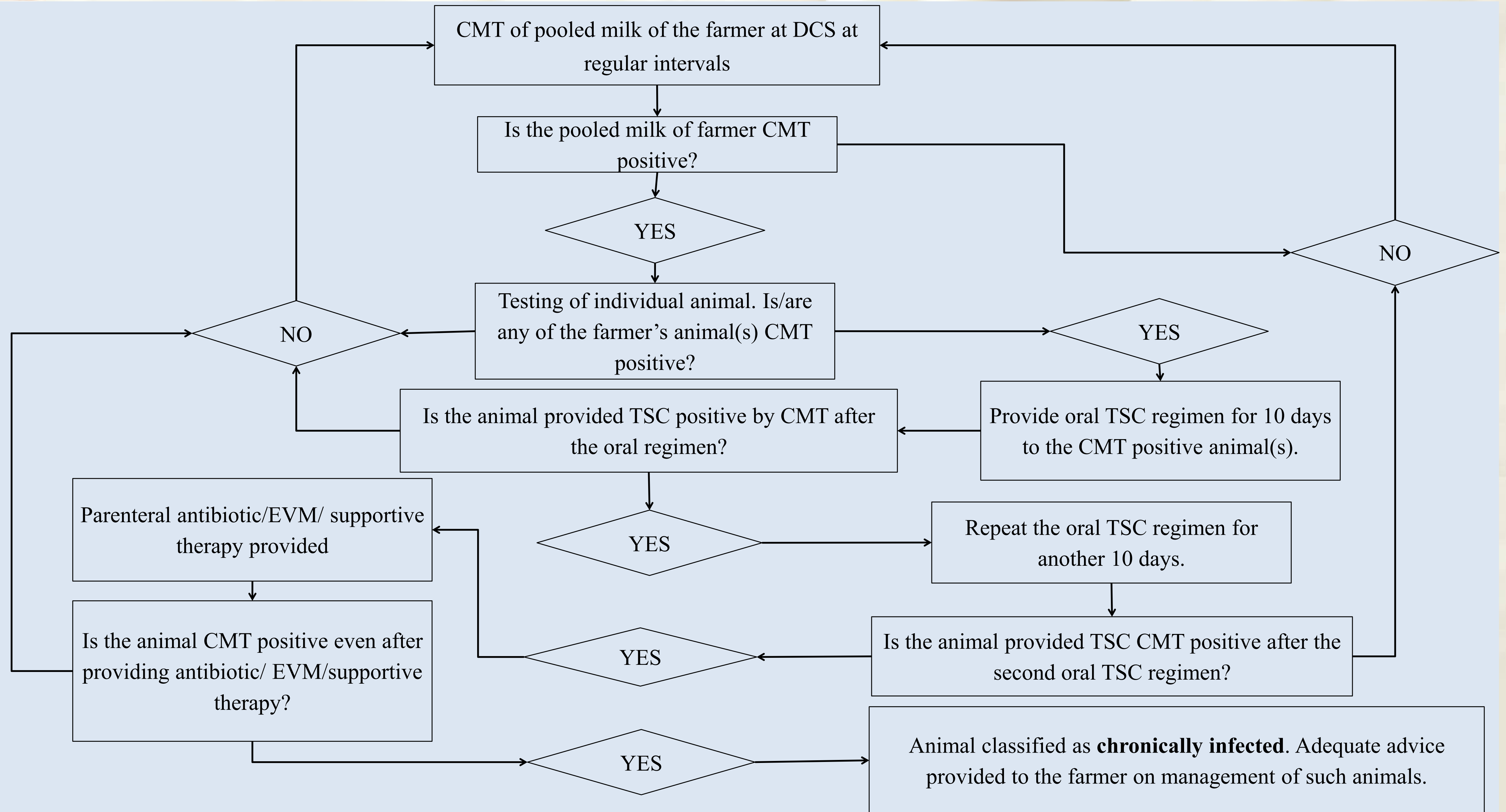


- Trisodium citrate regimen to CMT positive animals
- Antibiotic course to TSC non-responsive animals
- Management of chronically infected animals

Field approach in mastitis control



Workflow for SCM control and identifying chronic animals



NDDDB's experience- Project area

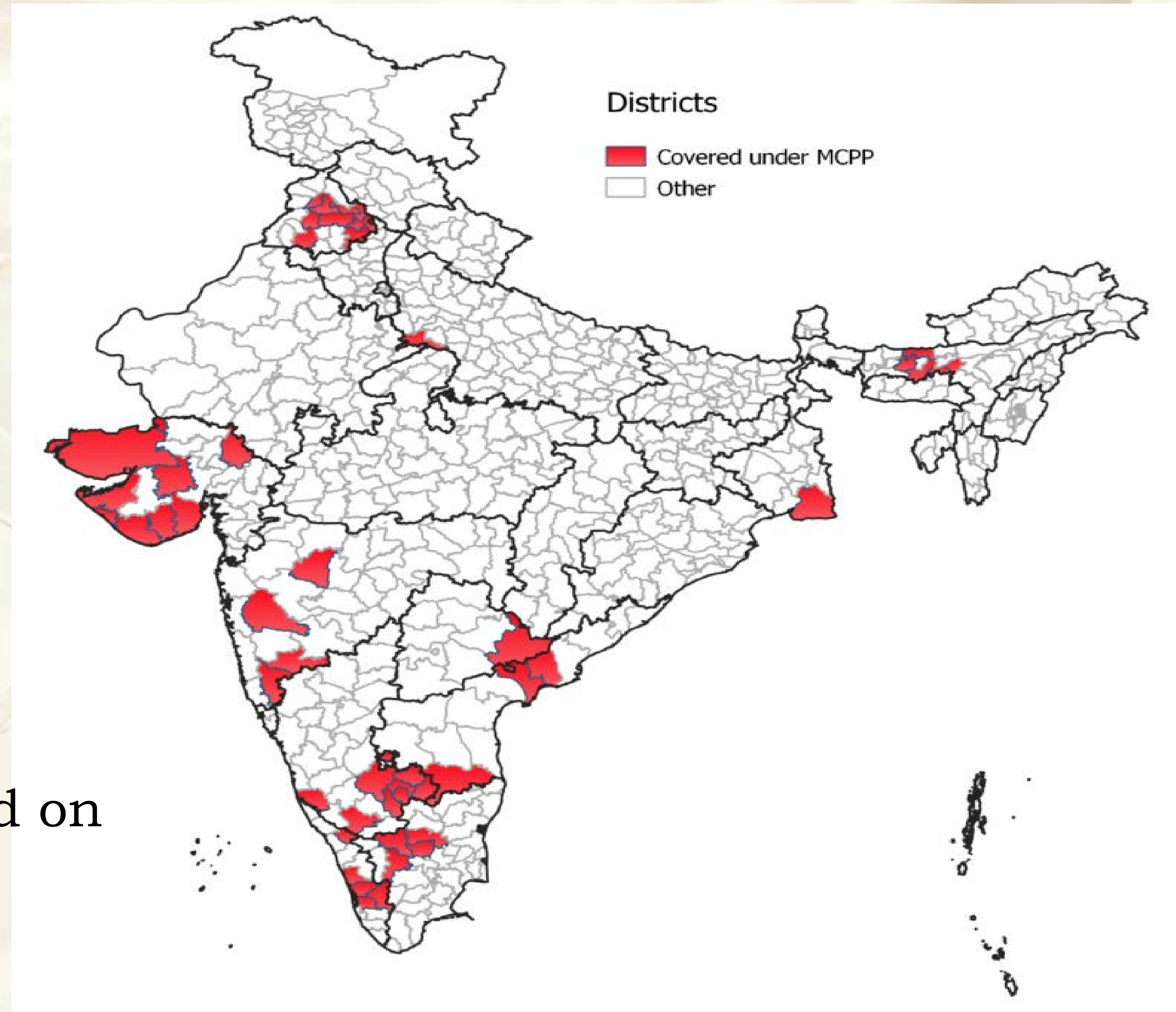


Project coverage

- ❑ >1500 DCSs
- ❑ >25 Milk Unions
- ❑ 11 States

Training

- ❑ 6853 Animal Husbandry personnel trained on EVM (1064 vets)



Period

- ❑ Since 2016-17

Case records

- ❑ ~5.2 lakh cases recorded for various ailments

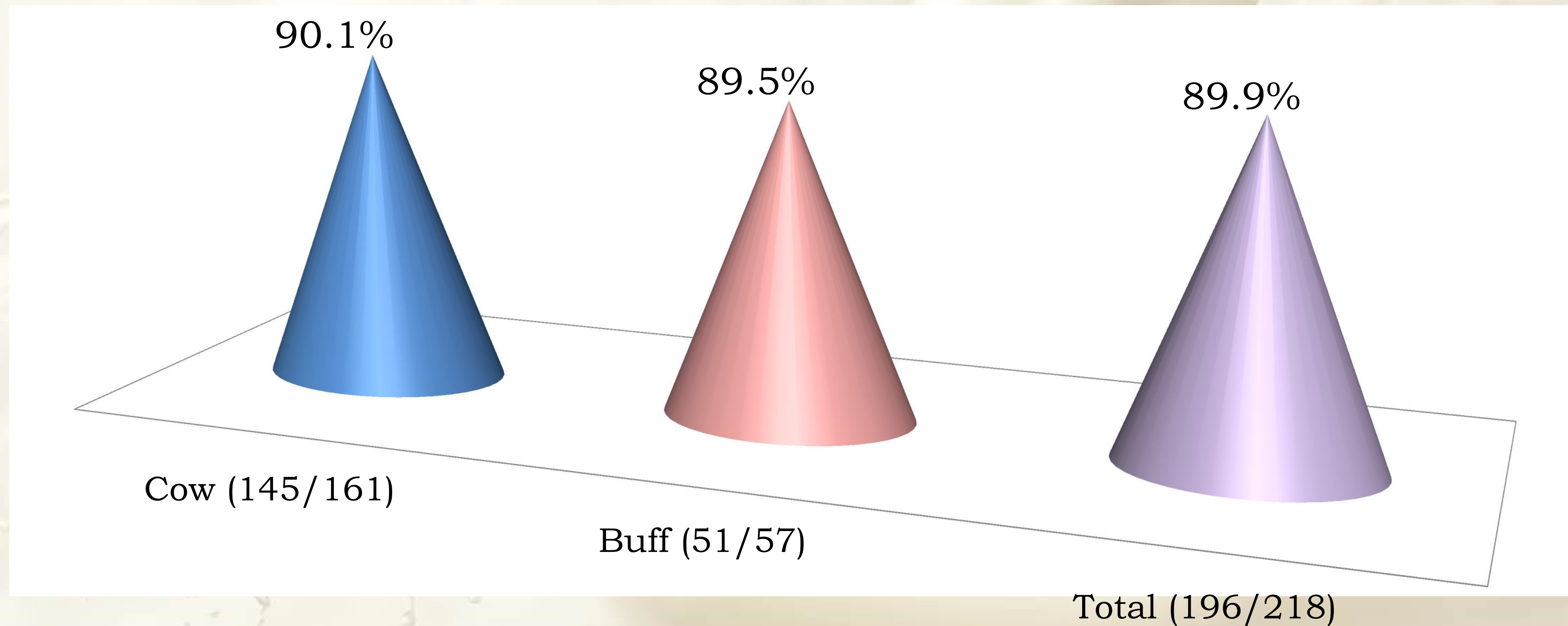
Demo plots

- ❑ 550 demo plots established

NDDDB's experience- Mastitis Control



Effect of TSC on CMT results



- About 90% of the CMT positive animals became CMT negative after the first or second trisodium citrate (TSC) oral regimen.
- The generic form of trisodium citrate (TSC) is 92% cheaper than branded products!

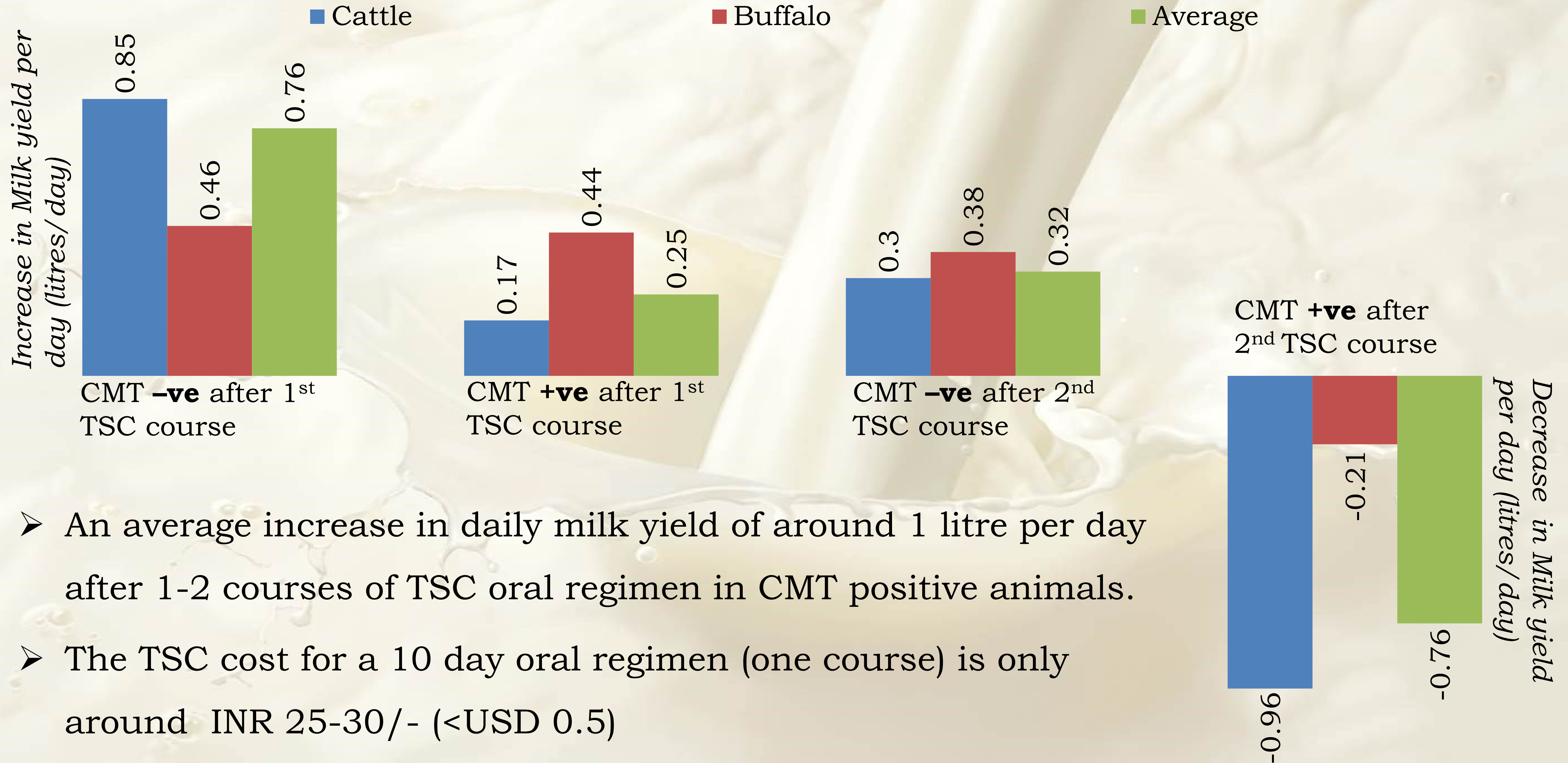


Effect of TSC on CMT results on a larger population

S.no	Description	Numbers
1	Total animal-wise data available in INAPH on CMT positivity	22,876
2	Number of animals that tested negative after the first TSC regimen	14659 (64%)
3	Number of CMT positive animals that tested negative after the second TSC regimen	4789 (21%)
4	Total number of animals that turned CMT negative after 1 st or 2 nd TSC regimen (2+3)	19448 (85%)

NDDB's experience- Mastitis Control

Effect of TSC on milk yield

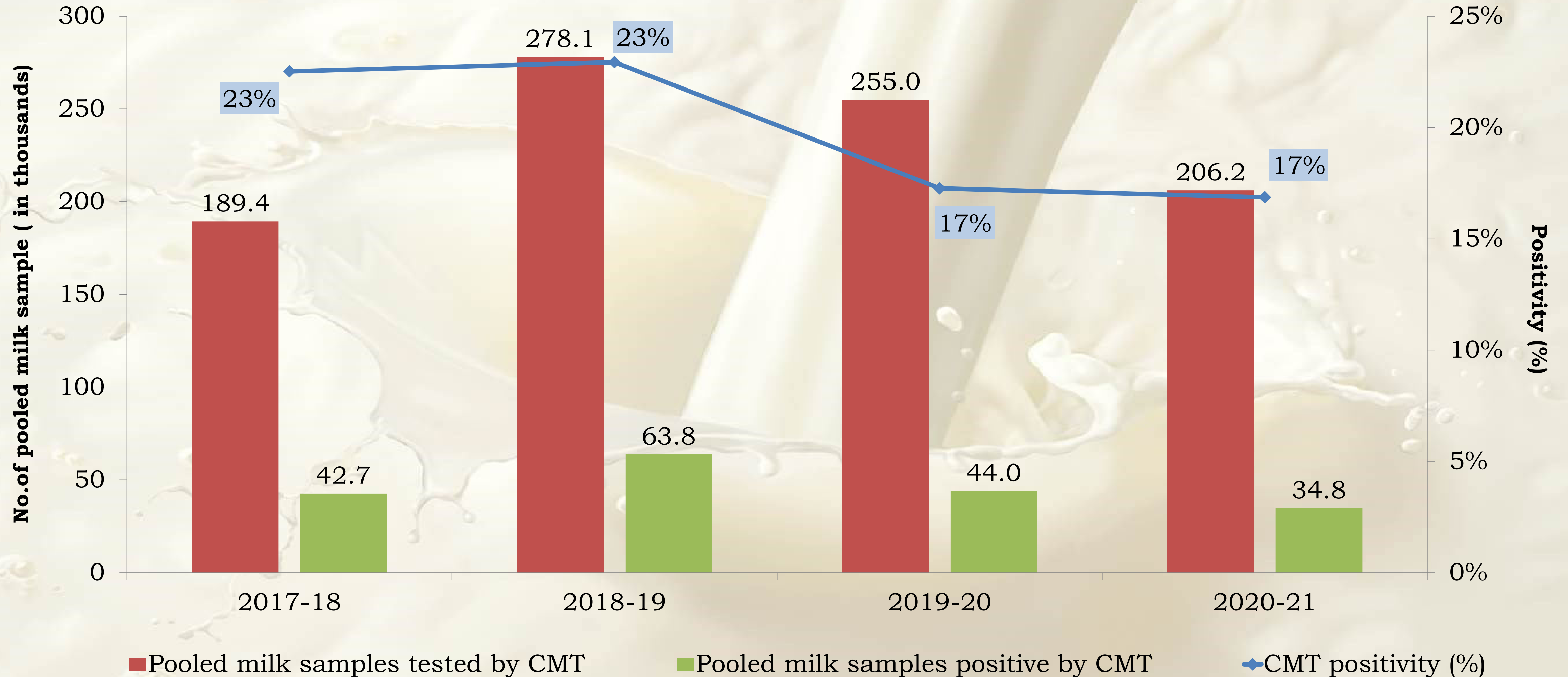


- An average increase in daily milk yield of around 1 litre per day after 1-2 courses of TSC oral regimen in CMT positive animals.
- The TSC cost for a 10 day oral regimen (one course) is only around INR 25-30/- (<USD 0.5)

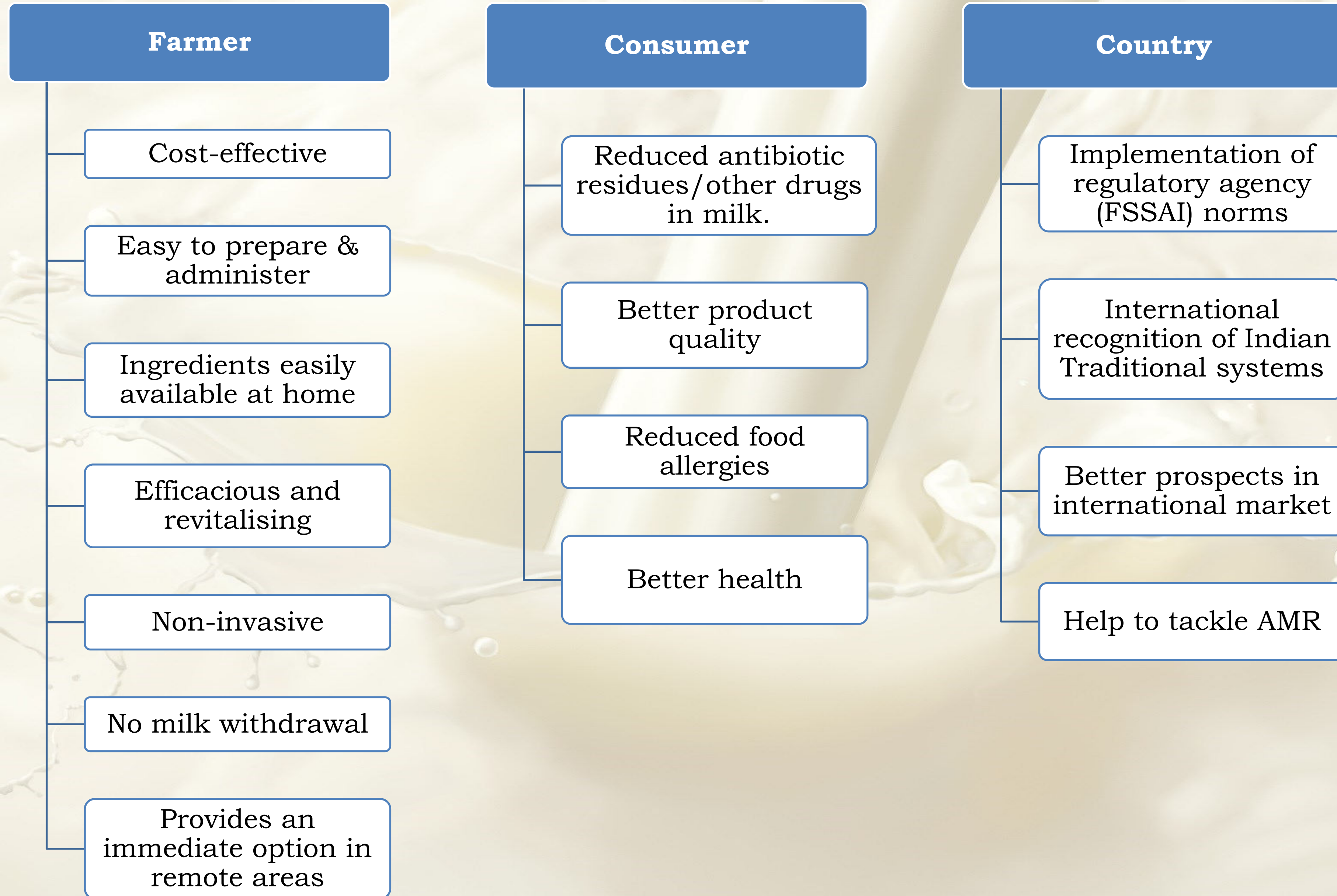


NDDB's experience-Mastitis Control

Effect of field model on CMT positivity



The rationale





NDDDB's experience-EVM

Cases treated by EVM

**5,19,248 cases with
82% cure rate at present (2021)**

Ailments

Retention of
placenta

Swelling of
joints

Leucoderma

Anoestrus

Endometritis

Milk fever

Joint ill

Teilitis

Metritis

Pyometra

Cystic ovary

Poisoning

Indigestion

Agalactia

Ailments

Mastitis

Bloat

Blood in milk

Deworming

Diarrhoea

Downer

Ectoparasites

Fever

FMD foot lesion

Prolapse

Repeat breeder

Teat obstruction

Udder Oedema

Wart

Wound



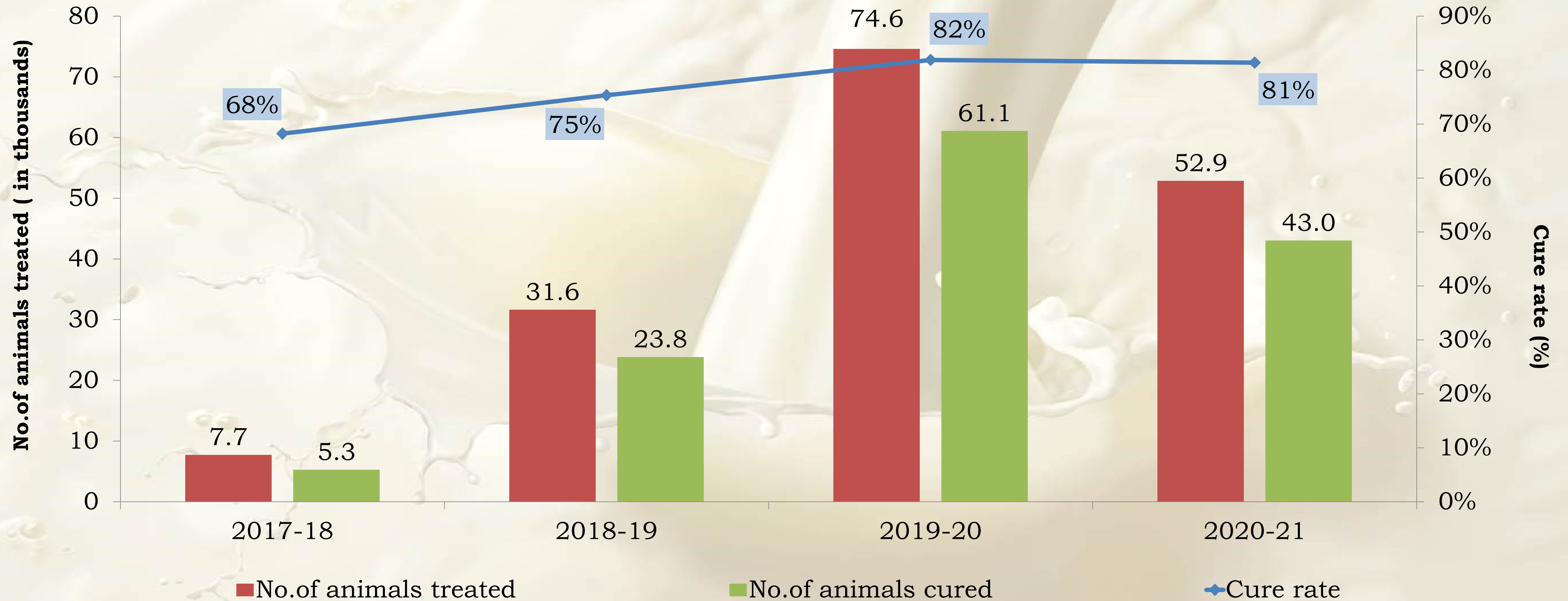
**8,100 cases with
68 % cure rate
in 2017-18**

**Data captured through an
online system**



NDDB's experience-EVM

Cases of mastitis treated by EVM



EVM for all types of mastitis



Mastitis (all types)



Aloe vera



Mustard or
Gingelly oil



Lemon



Lime



Turmeric Powder

Botanical name	Proportion used
Aloe vera	250 gm
Curcuma longa (Turmeric)	50 gm
Calcium hydroxide	15 gm



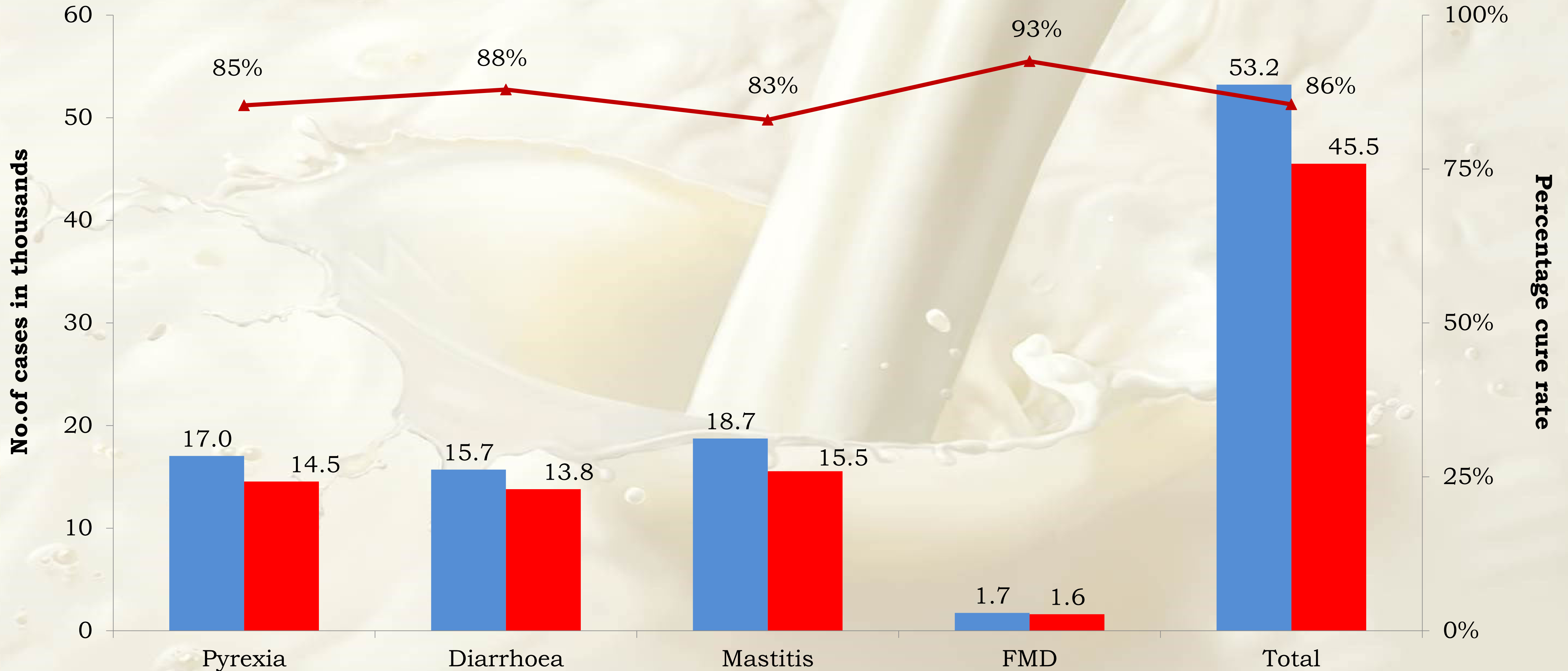
EVM paste on udder for treatment of all types of mastitis

NDDDB's experience-EVM



EVM cases recorded by veterinarians

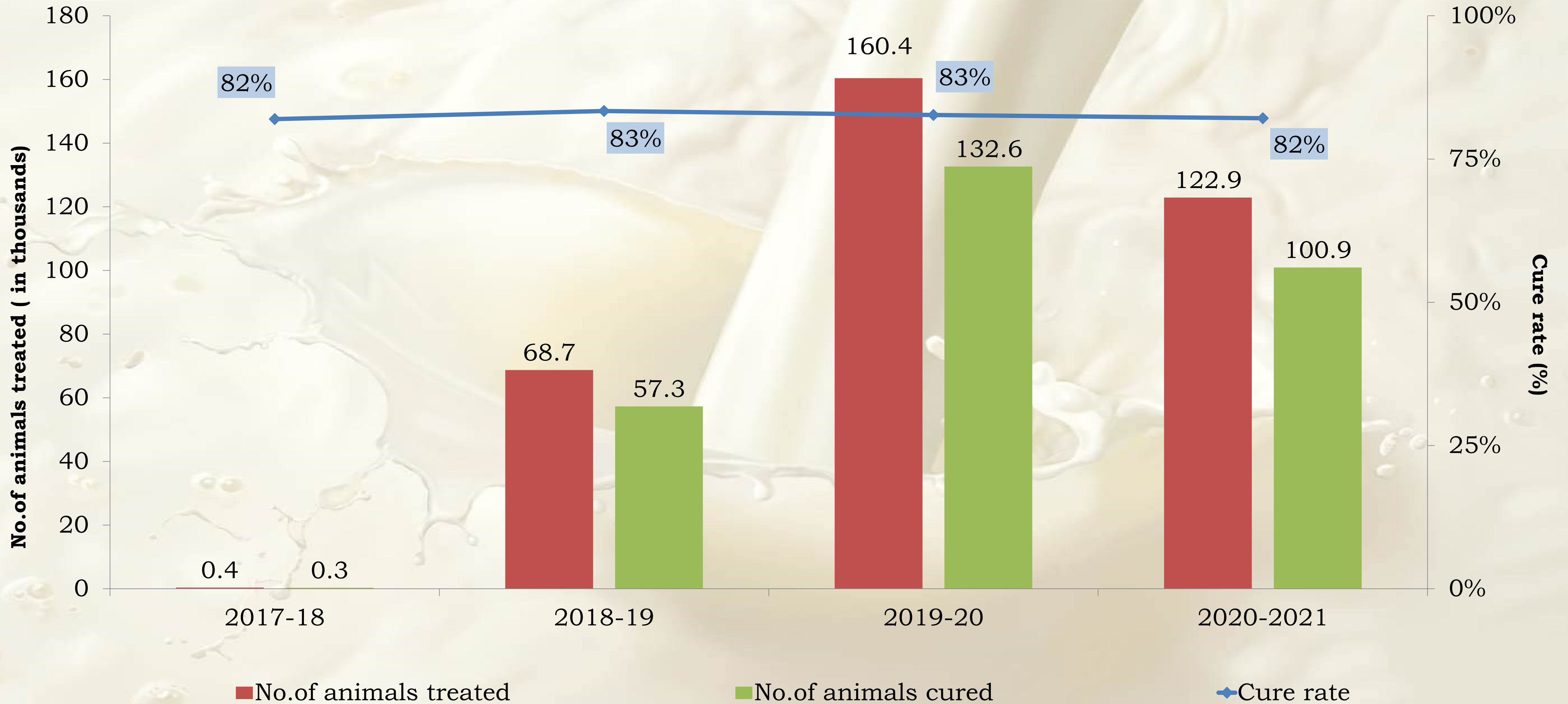
■ Number treated ■ Number cured ▲ Percentage cured



NDDB's experience-EVM



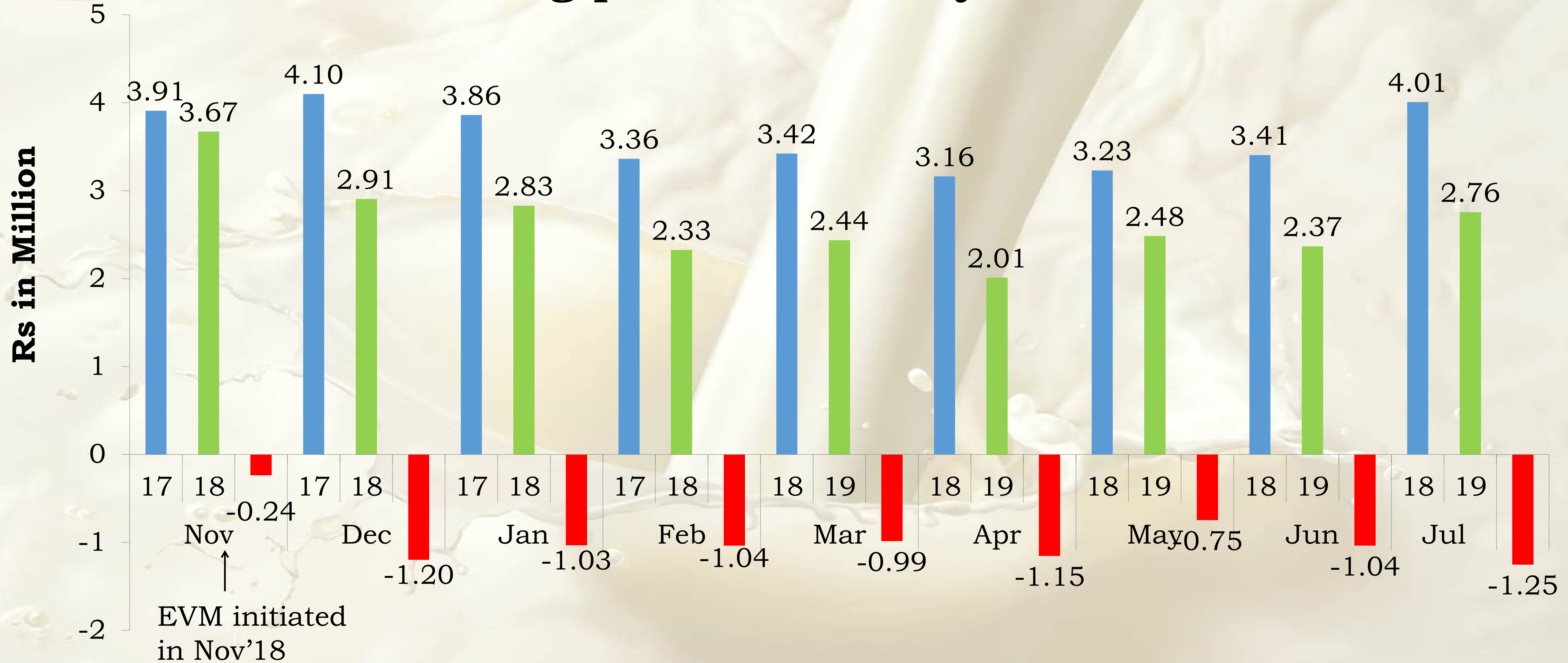
Cases of other ailments treated by EVM



NDDDB's experience-EVM



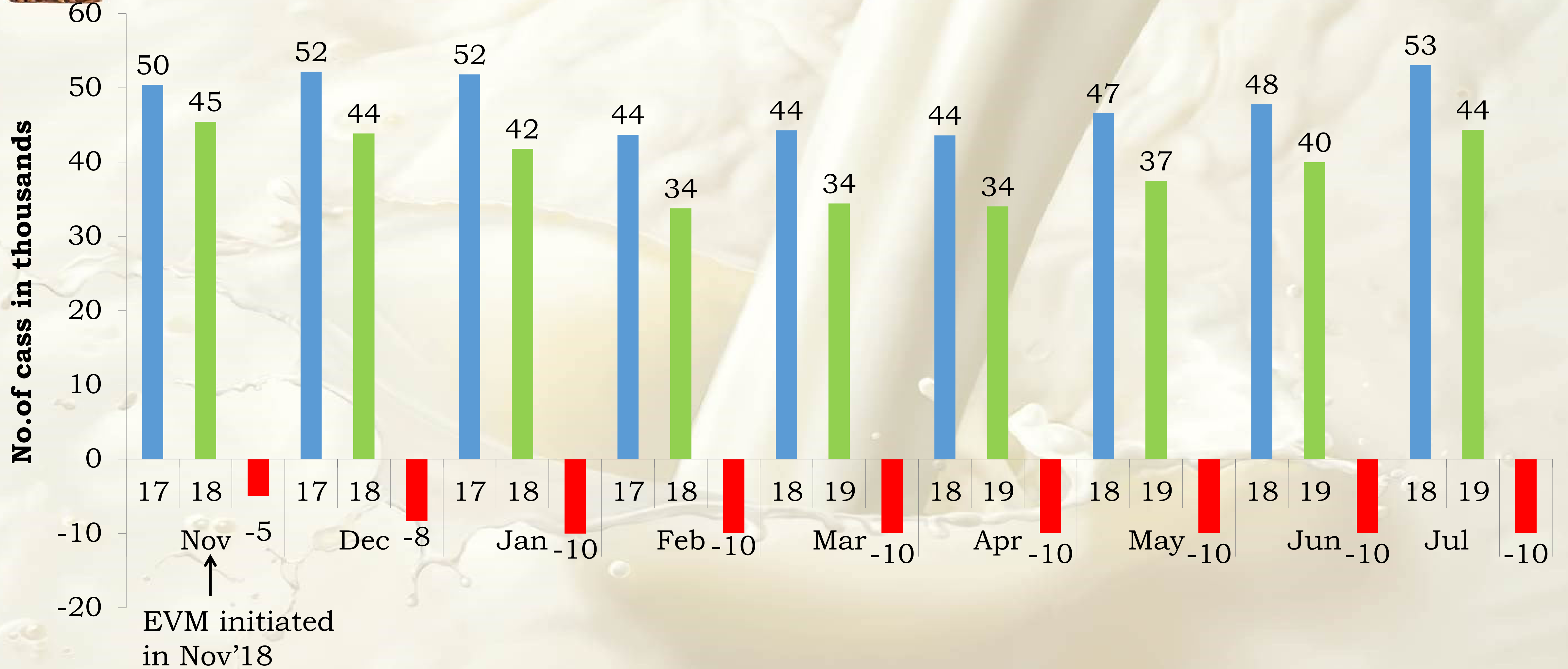
Reduction in drug purchase in a year in a milk union



A reduction of INR 8.6 million in drug purchase from Nov'18 to July'19

NDDDB's experience-EVM

EVM knowledge transfer to the farmer



➤ ***A reduction of 83,000 cases vs the previous year indicating knowledge transfer happening at the ground level to the farmer.***



Popularisation measures EVM booklets in 12 languages





Popularisation measures

Mastitis (all types)



Aloe vera



Mustard or
Gingelly oil



Lemon



Lime



Turmeric Powder

Oil based Preparation

Ingredients : For one day

Aloe vera (whole leaf) - 250 g; Turmeric powder - 50 g; Calcium hydroxide (lime) - 15 g; Lemon - 6 no.s ; Mustard or Gingelly oil - 600 ml.

Preparation:

(i) Cut Aloe vera whole leaf into small pieces (after removing the thorns).(ii) Blend along with turmeric powder and lime to form a reddish paste.

Application:

(i) Wash, clean and completely milk out all quarters (including unaffected) and dry the udder.(ii) Take a handful of the paste and add 200ml of mustard or gingelly oil to make it thin.(iii) Apply the paste diluted in oil three times a day for 5 days each time after following the step (i) above. (iv) Feed two lemons orally at a time (cut into halves) thrice a day for 3 days.



Scan this QR code to view the video on YouTube

QR codes for video links

- 15 video clips on preparation and application for different ailments prepared with voice overs in 12 languages = 180 clips, all available on YouTube. 16 more completed for 8 new ailments in Hindi and English, translation and dubbing process is underway.
- QR codes for each video in various vernacular languages (12) provided in the brochure for the particular ailment.
- Main aim is to bring about transfer of knowledge to the farmer.















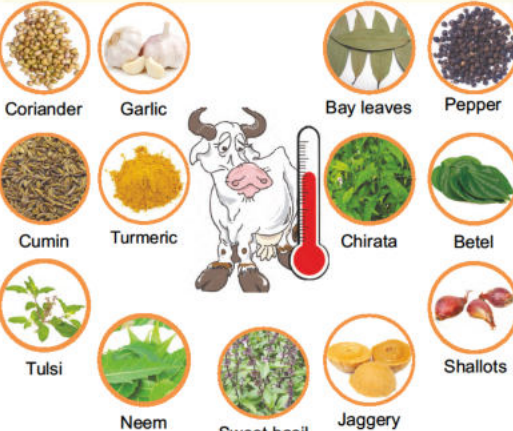















Popularisation measures Posters for display



ETHNOVETERINARY FORMULATIONS FOR IMPORTANT AILMENTS IN BOVINES



<h3>Mastitis (all types)</h3>  <p>Ingredients: a) Aloe vera – 250 g; b) Turmeric- 50 g (rhizome or powder); c) Calcium Hydroxide (lime)-15 g; d) Lemon – 2 nos.</p> <p>Preparation: (i) Blend ingredients (a to c only) to form a reddish paste. (ii) Cut both lemons into half.</p> <p>Application: (i) Make a handful of paste watery by adding 150-200 ml of water. (ii) Wash and clean the udder and apply the mixture throughout. (iii) Repeat application 10 times a day for 5 days. (iv) Feed 2 lemons twice daily for 3 days.</p> <p>Note: For blood in milk, in addition to the above, make a paste of curry leaves (2 handfuls) and jaggery and feed orally twice daily till condition resolves.</p>  Scan this QR code to view the video on YouTube	<h3>Tick/Ectoparasites</h3>  <p>Ingredients: Garlic- 10 pearls; Neem leaves- 1 handful; Neem fruit-1handful; Acorus rhizome- 10 g; Turmeric powder- 20 g; Lantana leaves- 1 handful; Tulsi leaves-1 handful.</p> <p>Preparation: (i) Blend all the ingredients. (ii) Add one litre of clean water. (iii) Strain with a fine sieve or muslin cloth. (iv) Transfer to a bottle attached to a sprayer.</p> <p>Application: (i) Spray on the entire body of the animal. (ii) Also spray on any cracks and crevices in the cattle shed. (iii) Application can also be done using a cloth dipped in the solution. (iv) Repeat once a week till the condition resolves. (v) Do the application only during sunny part of the day.</p>  Scan this QR code to view the video on YouTube	<h3>Udder Oedema</h3>  <p>Ingredients: Sesame or mustard oil – 200 ml; Turmeric powder- 1 handful; Garlic-2 pearls.</p> <p>Preparation: (i) Heat oil, add turmeric powder and sliced garlic. (ii) Mix well and remove from flame just as the flavour develops (no need to boil). (iii) Allow to cool.</p> <p>Application: (i) Apply in a circular manner with force over the entire oedematous region and udder. (ii) Apply 4 times a day for 3 days.</p> <p>Note: Rule out mastitis before using the formulation.</p>  Scan this QR code to view the video on YouTube	<h3>Diarrhoea</h3>  <p>Ingredients: Fenugreek seeds – 10 g; Onion- 1 no.; Garlic- 1 pearl; Cumin seeds- 10 g; Turmeric- 10 g; Curry leaves- 1 handful; Poppy seeds – 5 g; Pepper- 10 g; Jaggery- 100 g; Asafoetida- 5 g.</p> <p>Preparation: (i) Dry fry cumin seeds, asafoetida, poppy seeds and fenugreek seeds till smoke emanates. (ii) Cool and powder the fried seeds. (iii) Blend it with rest of the ingredients to form a paste.</p> <p>Application: (i) Roll the paste into small balls. (ii) Administer orally in small portions once daily for 1-3 days till condition cures.</p>  Scan this QR code to view the video on YouTube	<h3>Retention of Placenta</h3>  <p>Ingredients: White radish – 1 full tuber; Lady's finger - 1.5 kg; Jaggery- as required; Salt- as required</p> <p>Preparation: (i) Cut each lady's finger into 2 pieces.</p> <p>Application: (i) Feed one full tuber radish within two hours of calving. (ii) Feed 1.5 Kg of fresh lady's finger with jaggery and salt if ROP persists after 8 hours of calving. (iii) In case ROP persists even after 12 hours of calving, tie a knot very close to the base and cut 2 inches below the knot and leave it. The knot will go in. (iv) Do not try to remove the retained placenta by hand. (v) Feed one full tuber of radish once a week for four weeks.</p>  Scan this QR code to view the video on YouTube	<h3>FMD foot lesions/wound</h3>  <p>Ingredients: Acalypha indica leaves- 1 handful; Garlic-10 pearls; Neem leaves- 1 handful; Coconut or Sesame oil- 250ml; Turmeric powder – 20 g; Mehndi leaves- 1 handful; Tulsi leaves – 1 handful.</p> <p>Preparation: (i) Blend all the ingredients thoroughly. (ii) Mix with 250 ml coconut or sesame oil and boil and bring to cool.</p> <p>Application: (i) Clean the wound and apply directly or bandage with a medicated cloth. (ii) Apply Anona leaf paste or camphorated coconut oil for the first day only if maggots are present.</p>  Scan this QR code to view the video on YouTube	<h3>Repeat breeding</h3>  <p>Application: (i) Start treatment on 1st or 2nd day of heat. (ii) Feed orally in fresh form in the following order once a day along with jaggery and salt: (a) 1 white radish daily for 5 days (b) 1 Aloe vera leaf daily for 4 days. (c) 4 handfuls of moringa leaves for 4 days. (d) 4 handfuls of cissus stem for 4 days. (e) 4 handfuls of curry leaves with turmeric for 4 days. (f) Repeat the treatment once again if the animal has not conceived.</p>  Scan this QR code to view the video on YouTube
<h3>Fever</h3>  <p>Ingredients: Garlic- 2 pearls; Coriander- 10 g; Cumin-10 g; Tulsi- 1 handful; Dry cinnamon leaves-10 g; Black pepper-10 g; Betel leaves- 5 no.s; Shallots- 2 bulbs; Turmeric powder- 10 g; Chirata leaf powder-20 g; Sweet basil- 1 handful; Neem leaves- 1 handful; Jaggery- 100 g.</p> <p>Preparation: (i) Soak cumin, pepper and coriander seeds in water for 15 mts. (ii) Blend and mix all ingredients to form a paste.</p> <p>Application: (i) Administer orally in small portions in the morning and evening.</p>  Scan this QR code to view the video on YouTube	<h3>Teat obstruction</h3>  <p>Ingredients: Freshly plucked & clean neem leafstalk- 1; Turmeric powder; Butter or Ghee</p> <p>Preparation: (i) Nip the neem leafstalk at the required length based on teat length. (ii) Coat the turmeric powder & butter/ghee mixture thoroughly on the neem leafstalk.</p> <p>Application: (i) Insert the coated neem leafstalk into the affected teat in an anti-clockwise direction. (ii) Replace with fresh neemstalk after each milking.</p>  Scan this QR code to view the video on YouTube	<h3>Worms</h3>  <p>Ingredients: Onion- 1 no; Garlic-5 pearls; Mustard seeds- 10 g; Neem leaves- 1 handful; Cumin- 10 g; Bitter gourd- 50 g; Turmeric- 5 g; Pepper- 5 g; Banana stem- 100 g; Common leucas- 1 handful; Jaggery- 100 g.</p> <p>Preparation: (i) Soak pepper, cumin and mustard seeds for 30 mts. (ii) Blend along with other ingredients to form a paste.</p> <p>Application: (i) Roll the paste into small balls. (ii) Administer in small portions with salt once daily for 3 days.</p>  Scan this QR code to view the video on YouTube	<h3>Pox/wart/cracks</h3>  <p>Ingredients: Garlic-5 pearls; Turmeric powder- 10 g; Cumin seeds-15 g; Sweet basil – 1 handful; Neem leaves – 1 handful; Butter (preferred) or ghee-50 g.</p> <p>Preparation: (i) Soak cumin seeds in water for 15 mts. (ii) Blend all ingredients to a fine paste. (iii) Add butter and mix well.</p> <p>Application: (i) Apply on affected part as many times as possible till condition resolves. (ii) Apply after drying the skin surface.</p>  Scan this QR code to view the video on YouTube	<h3>Bloat and Indigestion</h3>  <p>Ingredients: Onion- 100 g; Garlic-10 pearls; Dry Chilly- 2; Cumin seeds- 10 g; Turmeric- 10 g; Jaggery- 100 g; Pepper- 10 g; Betel leaves- 10 no.s; Ginger – 100 g</p> <p>Preparation: (i) Soak pepper and cumin seeds for 30 mts. (ii) Blend along with other ingredients to form a paste.</p> <p>Application: (i) Roll the paste into small balls. (ii) Administer orally in small portions with salt 3-4 times a day for 3 days.</p>  Scan this QR code to view the video on YouTube	<h3>Prolapse</h3>  <p>Ingredients: Aloe vera gel- from one full leaf; Turmeric powder- one pinch; Mimosa pudica leaves- 2 handfuls.</p> <p>Preparation: (i) Remove the gel from a whole leaf. (ii) Wash it multiple times till the sliminess is reduced. (iii) Add a pinch of turmeric powder and boil to half the original volume and allow to cool (iv) Prepare a paste of M. pudica leaves.</p> <p>Application: (i) Clean the prolapsed mass (ii) Sprinkle the gel on the prolapsed mass. (iii) Apply M.pudica paste after the gel dries. (iv) Repeat till the condition improves.</p>  Scan this QR code to view the video on YouTube	<h3>FMD mouth lesions</h3>  <p>Ingredients: Cumin seeds-10 g; Fenugreek seeds- 10 g; Black pepper- 10 g; Turmeric powder – 10 g; Garlic- 4 pearls; Coconut- 1; Jaggery- 120 g.</p> <p>Preparation: (i) Soak cumin, fenugreek and black pepper seeds in water for 20-30 mts. (ii) Blend all ingredients to a fine paste. (iii) Add 1 full grated coconut to the paste and mix by hand only. (iv) Prepare dose freshly for each application.</p> <p>Application: (i) Apply inside the mouth, tongue and palate. (ii) Give the preparation thrice a day for 3 to 5 days.</p>  Scan this QR code to view the video on YouTube



Popularisation measures Android App (e-Gopala)

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VoLTE 4G LTE2 100

पशुपालन और डेयरी विभाग
Department of Animal Husbandry and Dairying

राष्ट्रीय डेयरी विकास बोर्ड

e-गोपाला

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लॉग इन करें

यहाँ रजिस्टर करें

परीक्षण करें

ENGLISH
हिन्दी
गुजराती
मराठी
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राष्ट्रीय डेयरी विकास बोर्ड

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Department of Animal Husbandry and Dairying

NATIONAL DAIRY DEVELOPMENT BOARD

e-GOPALA

CALL PASHUMITRA

PASHU POSHAN
AYURVEDIC VETERINARY MEDICINE

MY PASHU AADHAR
MY ALERTS

EVENTS
PASHU BAZAAR

Logout

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BACK AYURVEDIC VETERINARY MEDICINE BACK

UDDER RELATED BREEDING RELATED FMD

DIGESTIVE SYSTEM RELATED ALLERGY POISONING

OTHERS

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BACK UDDER RELATED BACK

PAIN AND SWELLING WITH CHANGE IN COLOUR OF MILK OR FLAKES IN MILK

OEDEMA OF UDDER AND UNDERBELLY IN RECENTLY CALVED OR ANIMAL ABOUT TO CALVE

BLOCKAGE OF MILK FLOW FROM TEAT

WARTS

POX LESIONS

CRACKS ON SKIN

BLOOD TINGE IN MILK WITHOUT PAIN OR SWELLING

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BACK BREEDING RELATED BACK

PLACENTA NOT FALLING

NOT CONCEIVING EVEN AFTER MORE THAN 3 INSEMINATIONS

PORTION OF UTERUS OR RECTUM BULGING OUT OF THE BODY

ANIMAL NOT COMING TO HEAT

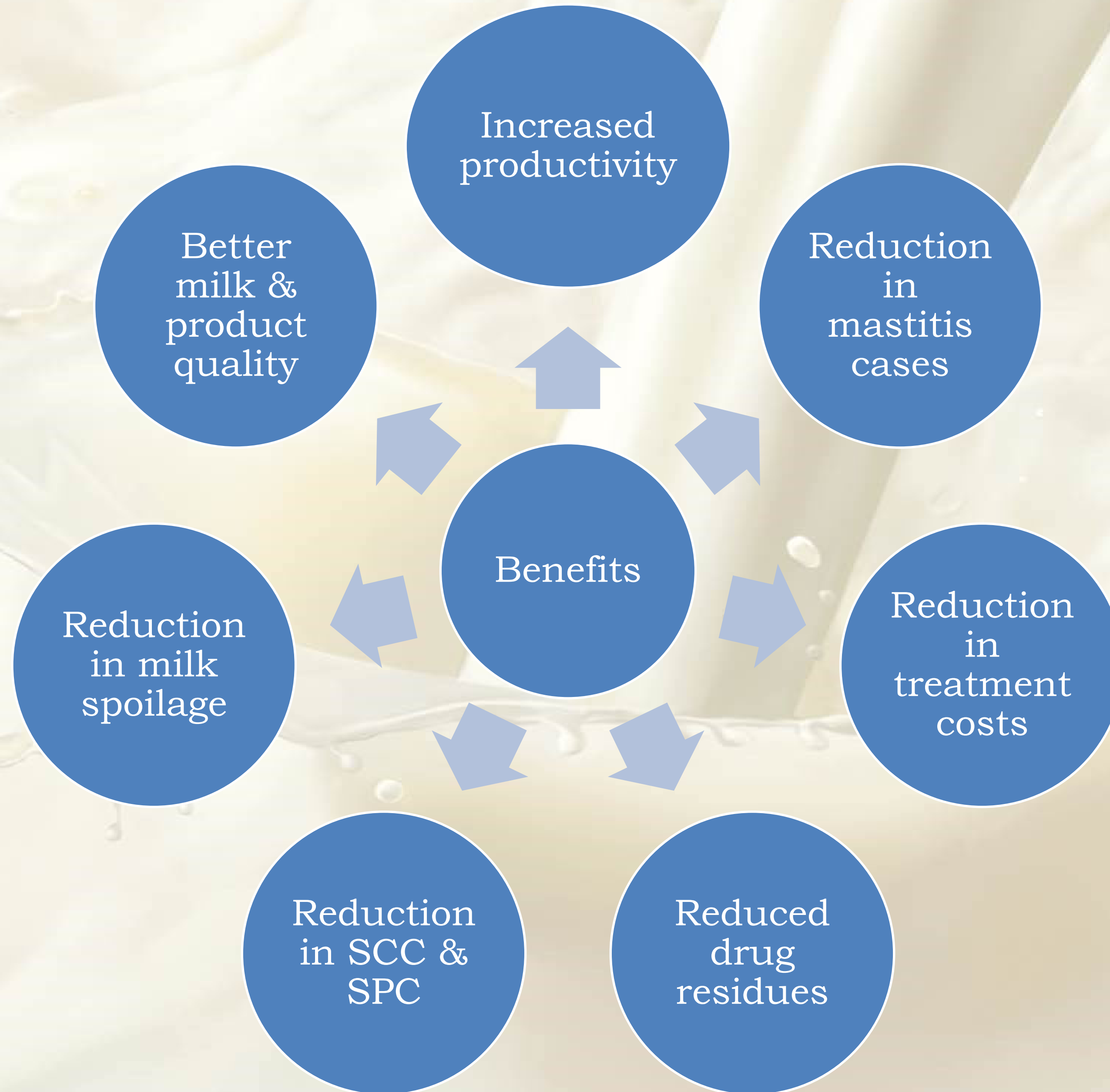
Way forward



- Global alliance on ethnoveterinary medicine.
- Inclusion in veterinary curriculum
- Linkages with premier traditional medicine institutes /practitioners.
- Research on the mode of action of formulations : Active principles, miRNAs ..
- Extensive use of various e-media in all major vernacular languages
 - Brochures, posters and videos
 - E-Gopala App available on Google play store
- Animal wise documentation
 - Using Information network for animal productivity and health (INAPH)
 - E-Gopala app
- Formulations for chronic diseases – brucellosis, Bovine TB, anaplasmosis, theileriosis etc
- Documentation of success stories
 - Traditional herbal formulations for cattle and buffaloes- facebook page.



A win-win situation for all!



Acknowledgements





Thank you for your kind
attention

Please visit us at :

**NDDB Facebook/NDDB Dairy
Knowledge portal**