Medicinal plants used in EVP

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Background

- The dairy sector in India is an important component in rural livelihoods.
- To enhance production of milk, a cross-breeding strategy with exotic breeds was introduced in India in 1960s.
- The unintended side effect of this strategy was a high incidence of diseases in cross-bred animals
- Therefore antibiotics had to be extensively used.

Background

- Indiscriminate use of antibiotics and other veterinary drugs in dairy animals leading to **high veterinary drug residues in the animal products**
- Threats to human health due to **microbial resistance to antibiotics**
- Loss of local breeds which have resistance to many diseases
- Weak animal / poor farm management in many farms
- **Reduced Milk quality**

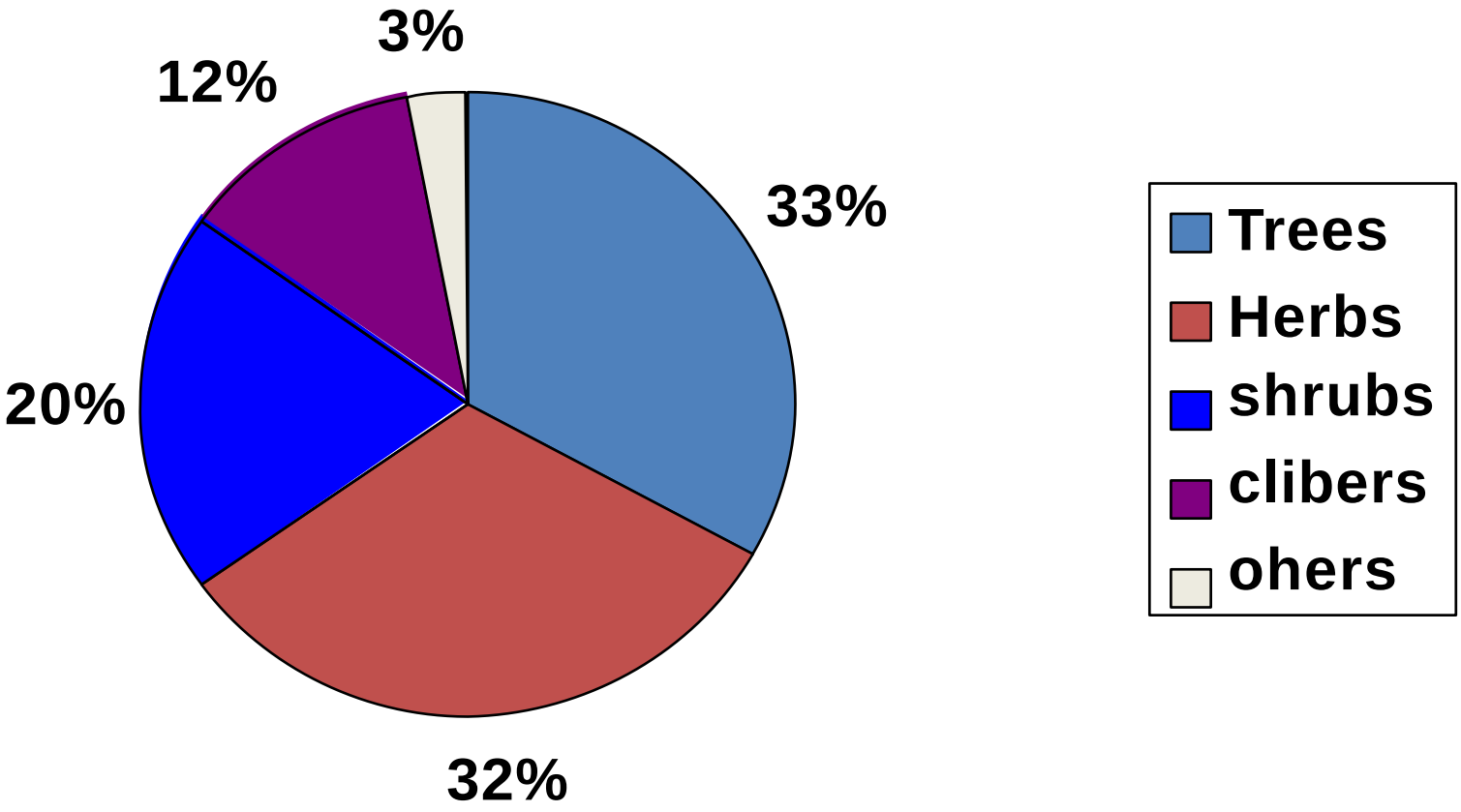
Alternative Approach

- **Efficacious and safe Ethno-veterinary Practices (herbal formulations) are available in India**
- **They are used in preventing and curing certain clinical conditions in livestock**
- **Thereby reduced the drug residues in the milk**
- **Also do Research and extension work**

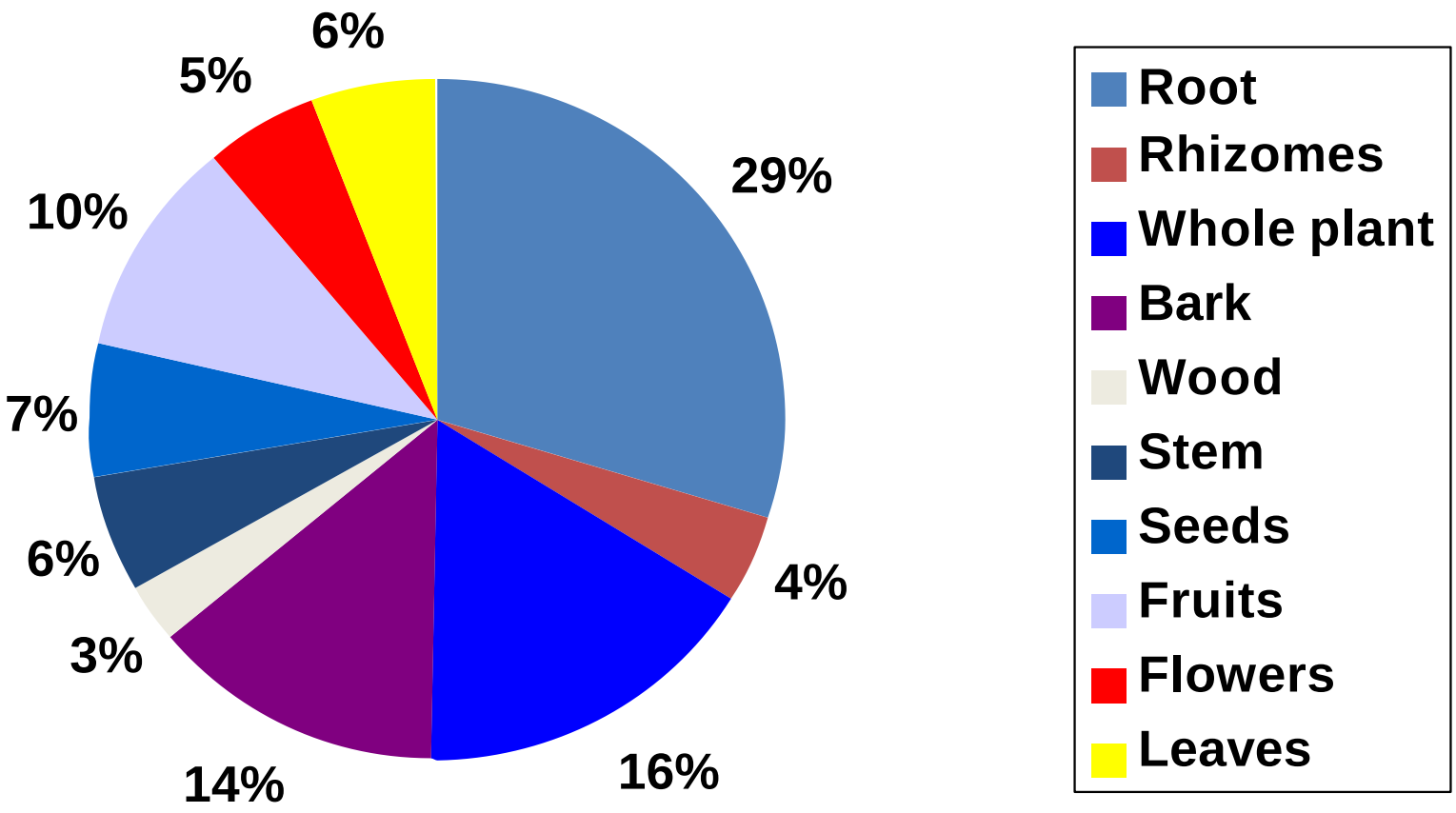
NATURAL RESOURCES USED IN LHT
(Human & livestock)

- > 6500 plants
- > 200 animal and other resource
- > 50,000 herbal formulation

Plant resource



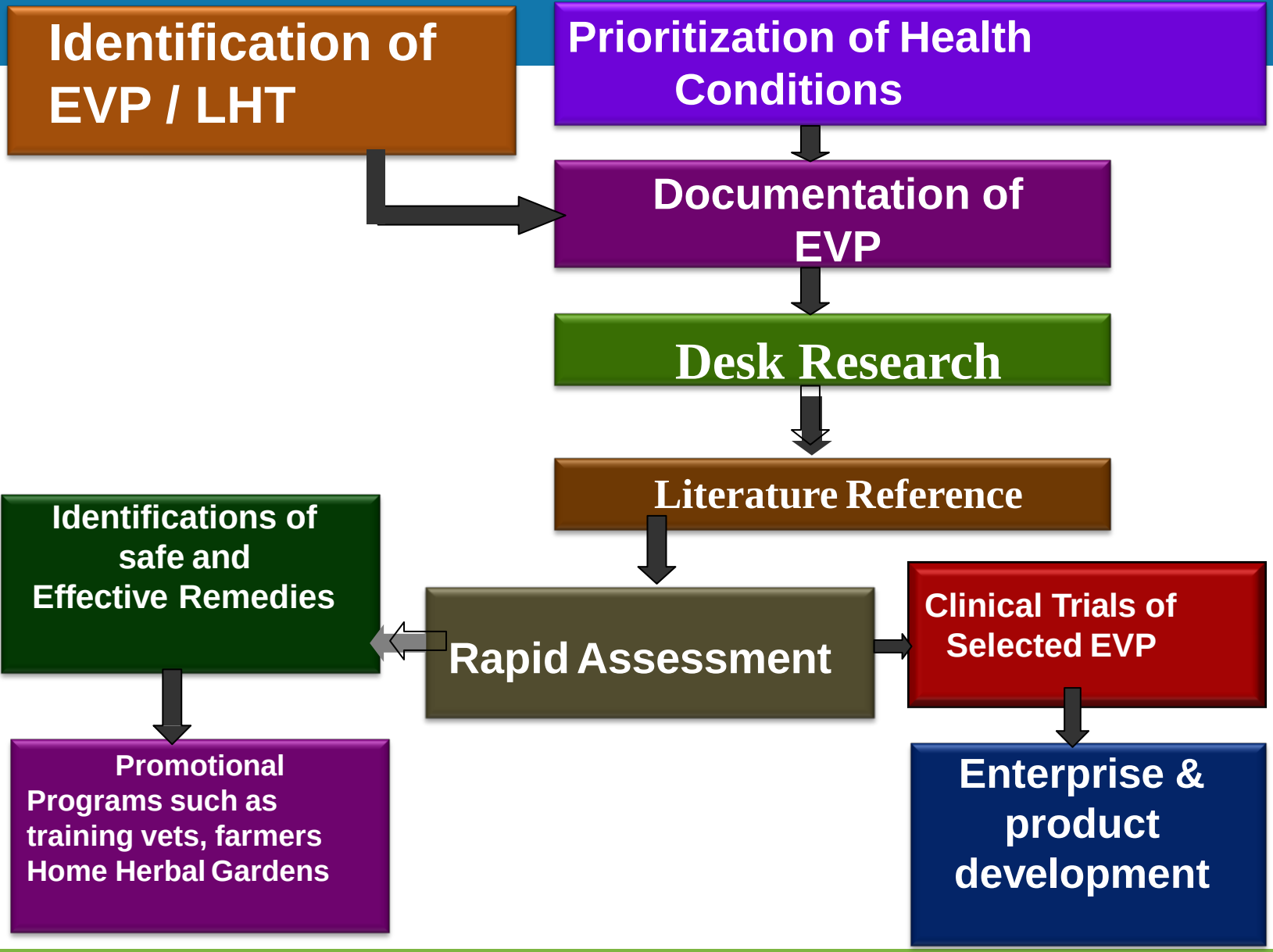
Useful parts from the plant resource



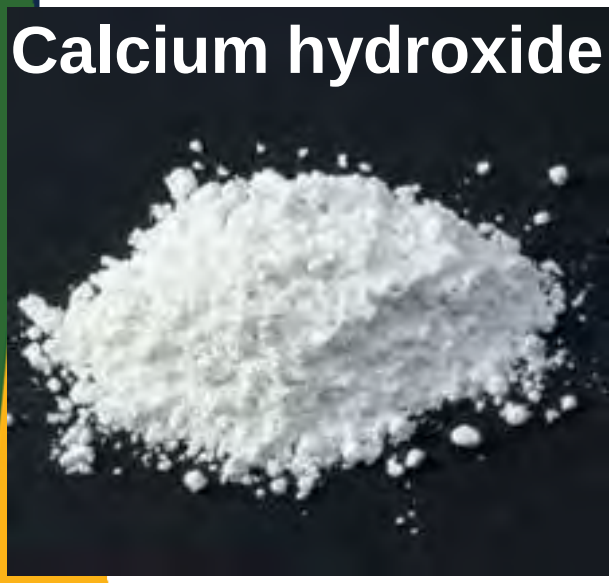
Ethno-veterinary practices

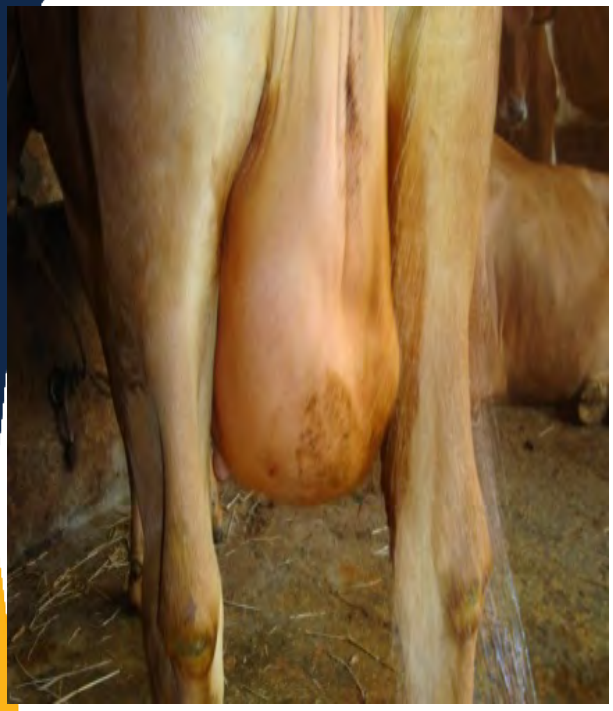
- TDU and TANUVAS had documented Ethno-veterinary practices from 24 locations from 10 states
- Established that 353 out of 441 formulations documented are safe and efficacious.
- 24 remedies have gone through clinical observation studies.

Steps in implementing strategy



Example of EVP remedy for Mastitis





Note: **In the case of chronic mastitis add *Cissus quadrangularis* in the formulation and the treatment should be continued till the hardness of the udder is completely disappear**

In-Vitro Antimicrobial Activity of Ethnoveterinary Herbal Preparation for Mastitis

The extracts of herbal formulation against mastitis had inhibitory activity against *E. coli* and *Staphylococcus aureus*

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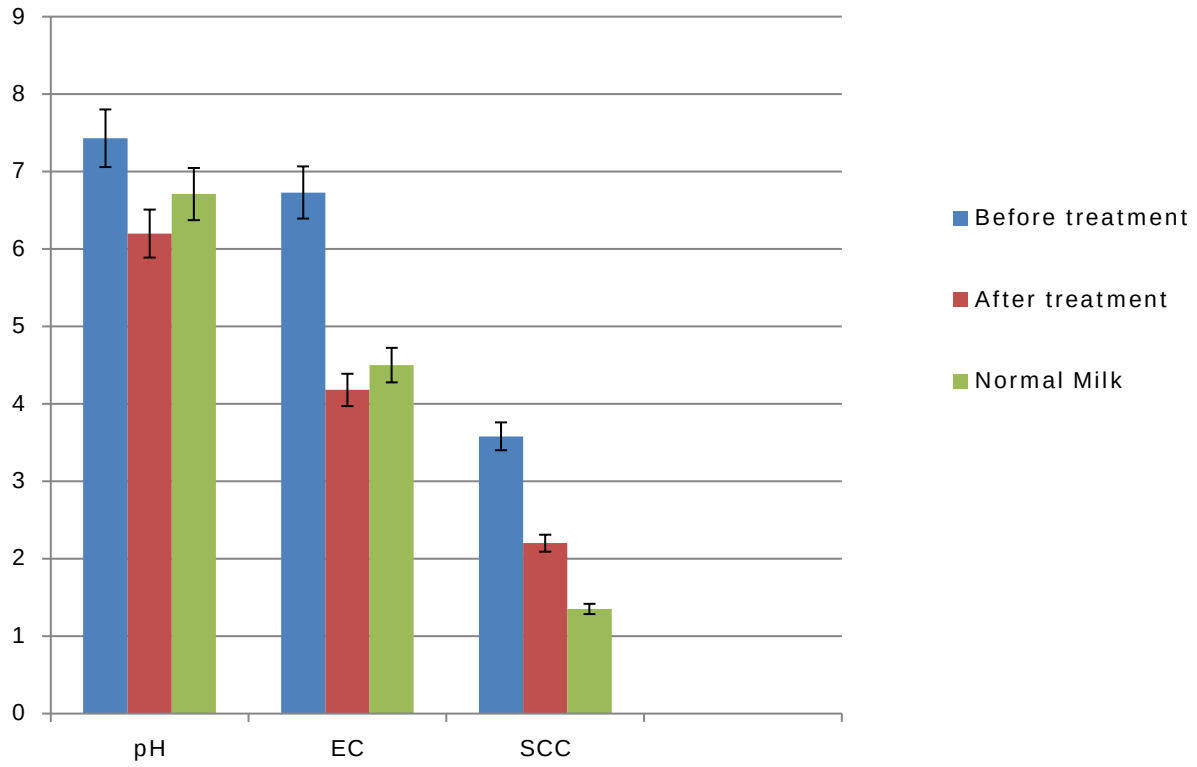
Research Article
Volume 3 Issue 2 - August 2017
DOI: 10.19080/JDVS.2017.03.555607
Dairy and Vet Sci J

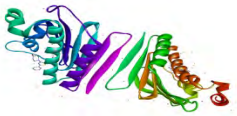
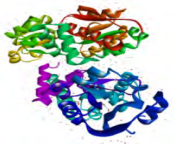
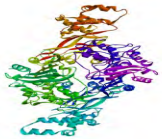
reduction of pH, Electrical Conductivity (EC) and Somatic Cell Count (SCC)before and after treatment with herbal formula in comparison with normal values.



Reverse pharmacology

The bioactive compounds were tested for its effect against the target proteins of *S. aureus* using molecular docking studies.

Punniamurthy et al. 2017.IJANS Vol. 6, Issue 5, Aug – Sep 2017; 23-30

Target	PDB ID	Structure of target	Total binding sites
BPL	3V7S		7
DNA gyrase	3G7B		5
opuCB	3O66		14
sirA	3MWF		7
SrtA	1T2W		14
PBP	3VSL		44

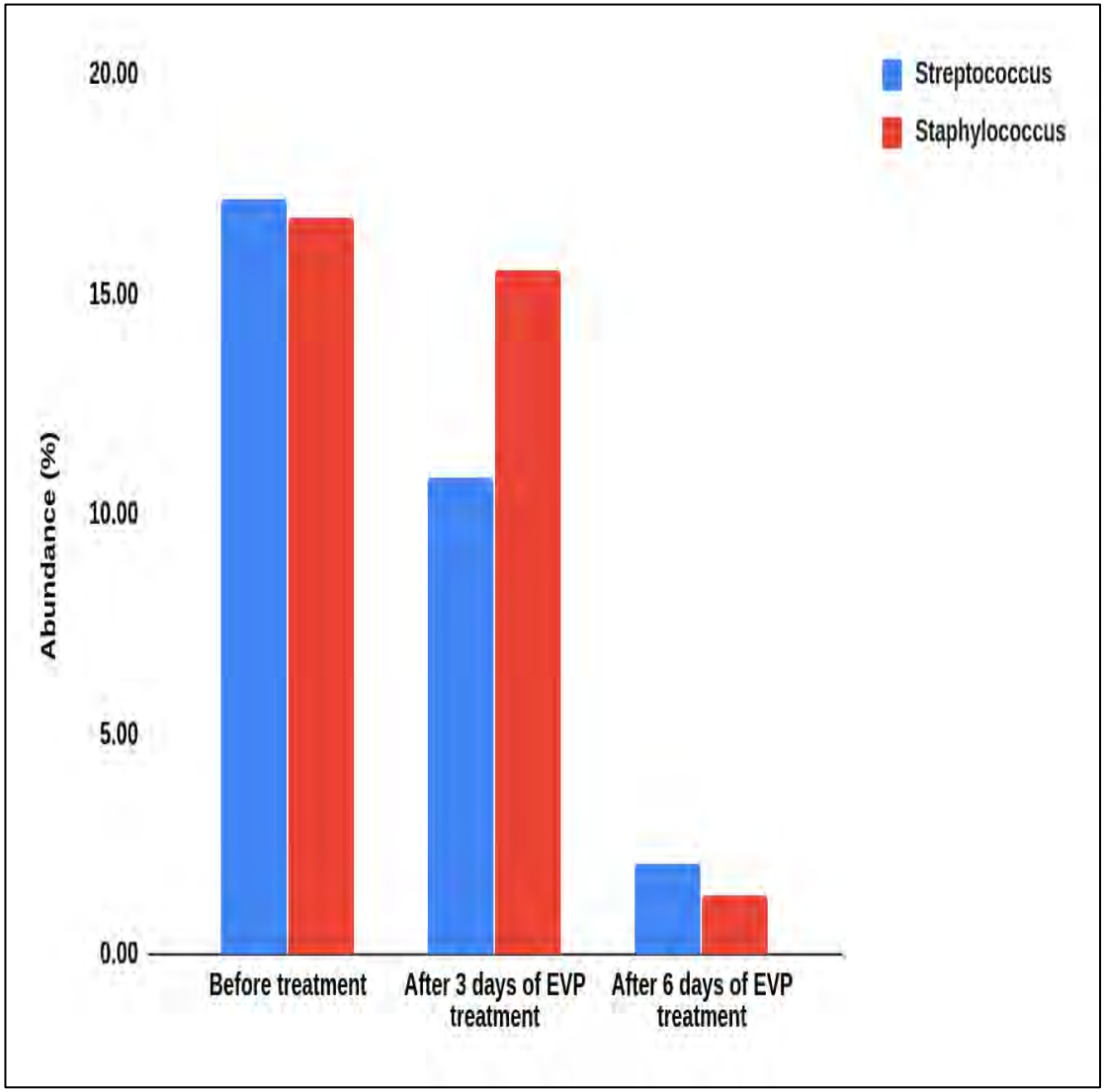


Figure 3a: Abundance of *Streptococcus* and *Staphylococcus* of control, Mastitis affected and EVP treated milk samples.

LSD

Fever

















Warts/ Udder pox



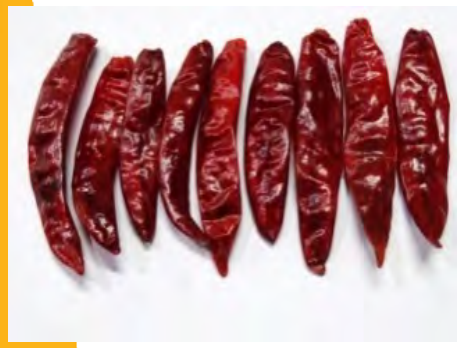







Metritis/ Repeat breeding

Bloat/indigestion



EVP training in 14 states

1. Andhra Pradesh
2. Assam
3. Delhi
4. Gujarat
5. Haryana
6. Karnataka
7. Kerala
8. Maharashtra
9. Punjab
10. Sikkim
11. Tamil Nadu
12. Telangana
13. Utter Pradesh
14. West Bengal

Data from NDDB

Information Network for Animal Productivity & Health (INAPH), an application that facilitates capturing of real time reliable data on Breeding, Nutrition and Health Services delivered at Farmer's Doorstep. It helps to asses and monitor progress of the projects.

https://www.nddb.coop/resources/inaph

S No	Ailment	Total treated cases	Total clinical recovery	% clinical recovery
1	Fever	113172	94583	83.6
2	Diarrhoea	110046	93658	85.2
3	Acute Mastitis	104475	82878	79.3
4	Chronic mastitis	52791	41502	78.6
5	Indigestion	27358	22961	83.9
6	Sub-clinical Mastitis	23986	19780	82.5
7	Anoestrus	17617	13132	74.5
8	Blood in milk	15718	13269	84.4
9	Repeat breeder	13262	9017	68.0
10	Deworming	11916	10690	89.7
11	Udder oedema	9567	7993	83.5
12	Wound	6534	5339	81.7
13	Retention of placenta	5744	4094	71.3
14	Bloat	5220	3959	75.8
15	Ectoparasites/ticks	4164	3444	82.7
16	Teat obstruction	4030	2714	67.3
17	Endometritis	3770	3056	81.1
18	Agalactia	2721	2048	75.3
19	Downer	2720	1801	66.2
20	Wart	2573	1802	70.0
21	Lumpy Skin Disease	2258	1693	75.0
22	Swelling/ Joint Pains	1913	1424	74.4
23	Prolapse	1543	1052	68.2
24	Poisoning (unknown origin)	647	448	69.2
Total EVM Treatment		543745	442337	81.4

Feedback from various milk societies from NDDB through INAPH * on the Efficacy of EVPs for 24 clinical conditions in cattle from 2017-18 to 2021-22

Antibiotic residue: Farmer's samples one year after intervention

MILK Union	Number of farmers	Antimicrobial residue Negative	residue Low Positive	Residue Positive
Allapra	15	12	2	1
Arakkapady	15	11	2	2
Chakkampuzha	10	10	0	0
Maneed	10	07	3	0
Manikyamangalam	15	12	2	1
Monippally	10	06	2	2
Puthrika	10	10	0	0
Sreemoolanagaram	15	15	0	0
Thirukanurpatti (TN)	20	20	0	0
Aralumallige (Karnataka)	20	20	0	0
	140	123	11	6
Per cent		87.86%	7.85%	4.29%

Reduction of disease incidence from 2016 to 2019

Disease	Mastitis			Enteritis			Repeat breeding			Cowpox		
Year	2016	2018	2019	2016	2018	2019	2016	2018	2019	2016	2018	2019
Average incidence per union	66	37	11	11	7	4	9	3	1	3	2	0
Per cent reduction		44%	84%		35%	81%		71%	96%		11%	100%

Average expenditure in Rupees for the treatment with Conventional medicine and EVP- the saving (1 USD = Rs.73.52 on 01/12/ 2020)

No	Disease conditions	n	western drug treatment	EVP treatment	Amount saved
1	Mastitis	35	3000	120	2880
2	Maggot wound	28	962.5	60	881.7
3	Bloat& Indigestion	34	719.4	224	495.4
4	Repeat breeding	23	3060.7	430	2630.9
5	Cow pox	18	583.3	335	250
6	Foot and Mouth Disease (FMD)	22	3165	1640	1525
7	Diarrhea	3	500	166	334

What India can share with others

- Train on documentation of local health tradition and resources
- Train stakeholders on use of herbal medicine on Livestock primary health care and reduce antimicrobial residue in the animal products
- Establish Home/institutional herbal gardens
- Pilots with herbal remedies

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Organizational garden - Milk Union

***Aloe vera* in grown by a farmer**


GROW BAG
UV STABILIZED


ANDOGRAPHIS PANICULATA


ಔಷಧ ಸಸ್ಯಗಳ ಪ್ರಾತ್ಯಕ್ಷತಾ ಘಟಕ
MEDICINAL PLANTS
DEMONSTRATION UNIT

Training and capacity building of farmers and other stakeholders


Thank You