

# เรื่อง "ผลิตภัณฑ์น้ำยาจุ่มเต้านมโค"

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25 ก.ย. 56



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# Mastitis



- ▶ Mastitis in dairy cattle is caused by bacterial infection from environmental and contagious
  - Environmental bacteria come from outside of the milking parlour,
    - *E. coli* (Toxic mastitis) and
    - *Streptococcus (Strep.) uberis* (no sign).
  - contagious bacteria generally spread during milking.
    - *Staphylococcus (Staph.) aureus* and
    - *Strep. agalactiae*.

# Mastitis

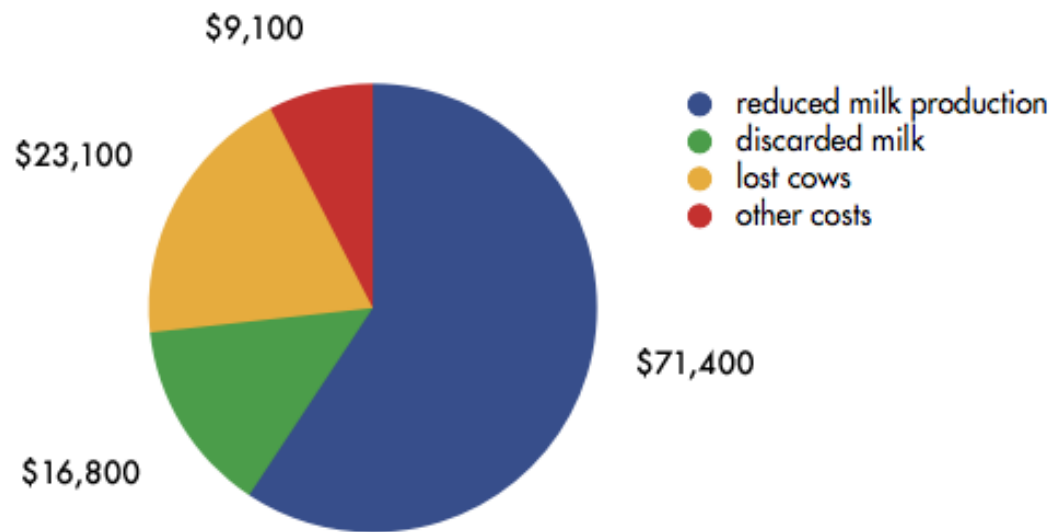


*Fig 3: A chronically infected shrunken quarter is often secondary to Staph aureus infection*

- ▶ an inflammation of the mammary gland
- ▶ it's been estimated that mastitis costs about \$200 per cow per year.
- ▶ approximately 40 percent of cows are infected in an average of two quarters in herds without effective treatment.

# Mastitis Losses

**MASTITIS LOSSES FOR TYPICAL 500-COW FARM EXCEED \$120,000**



# Objective of post milking disinfection

- ▶ to remove any contagious mastitis-causing pathogens
- ▶ To maintain teat skin in good condition

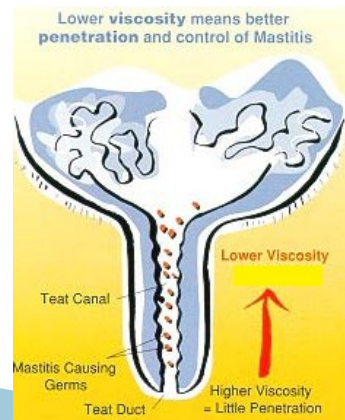


# Postmilking teat dipping

- ▶ Using a disinfectant teat dip after each milking is a means of diminishing by about 50% the risk of infection by contagious microorganisms like *Streptococcus agalactiae* and *Staphylococcus aureus*.
- ▶ It is important that the teat dip contain up to 10% of emollients to increase the suppleness of the teats: oils, glycerine, lanoline.
- ▶ Healthy supple skin is an extra insurance against entry of bacteria to the udder.
- ▶ *Staphylococcus aureus* does not persist on healthy skin.

# Ideal post milking disinfectant products

- ▶ have a persistent and effective killing action and leave the teats in a good condition.
- ▶ It is also useful if the product has a colour so teat coverage can be visually assessed.
- ▶ Dips must contain skin softeners and protectants to keep the teat skin and teat ends soft and healthy. (1% iodophor in 10% Glycerin)





# For the best possible effect

- ▶ dip or spray immediately after cluster unit removal,
- ▶ before the teat canal sphincter begins to close, and
- ▶ before any bacteria have the opportunity to colonise and multiply.

## Points to consideration for formulation approach

- ▶ Interaction between disinfectant and conditioning agent can lower the disinfecting action.
- ▶ a lack of conditioning agents can lead to sore, dry, cracked teats that may harbour mastitis causing pathogens.
- ▶ Dips must contain skin softeners and protectants to keep the teat skin and teat ends soft and healthy. (1% iodophor in 10% Glycerin).

# Spraying vs Dipping

- ▶ Easy and quick
- ▶ more product has to be used compared to dipping (15ml per cow) to get good teat coverage .
- ▶ takes a similar amount of time per cow as dipping
- ▶ is more prone to operator error.
- ▶ less product is used (10ml per cow) due the more controlled approach.
- ▶ Dip pots must be cleaned out between milkings as they can become contaminated with bedding materials and faecal matter from the cows which can affect the product's efficiency.

Spraying

Dipping

# Chemical types used for both pre- and post-milking treatments

## ▶ Iodine (0.3–1.0%)

- Broad spectrum disinfectant
- acidic base so require emollients to condition teat skin and avoid dryness and cracking of the skin.
- contamination of milk could affect consumer health
- Iodine is an oxidizer, meaning it “burns up” vital cell components of bacteria, fungi and some spores.
- it is economical.
- not all iodine products are created equal
- iodine can also be irritating to teat skin, especially if the skin is chapped, cracked or damaged in some other capacity. Skin conditioners and pH buffers are also an important consideration

## ▶ Chlorhexidine (0.5%)

- Broad spectrum disinfectant
- irritate to teat skin
- more expensive than iodine
- offers a residual effect
- less effective against *Pseudomonas* and *Serratia* species

## ▶ Hypochlorite

- can dry out teats if not used properly
- Inactivated by organic matter.
- Sodium hydroxide is added for stabilisation but this can increase the irritant effects and emollients can only be added immediately before use.

## ▶ Quarternary Ammonium Compounds

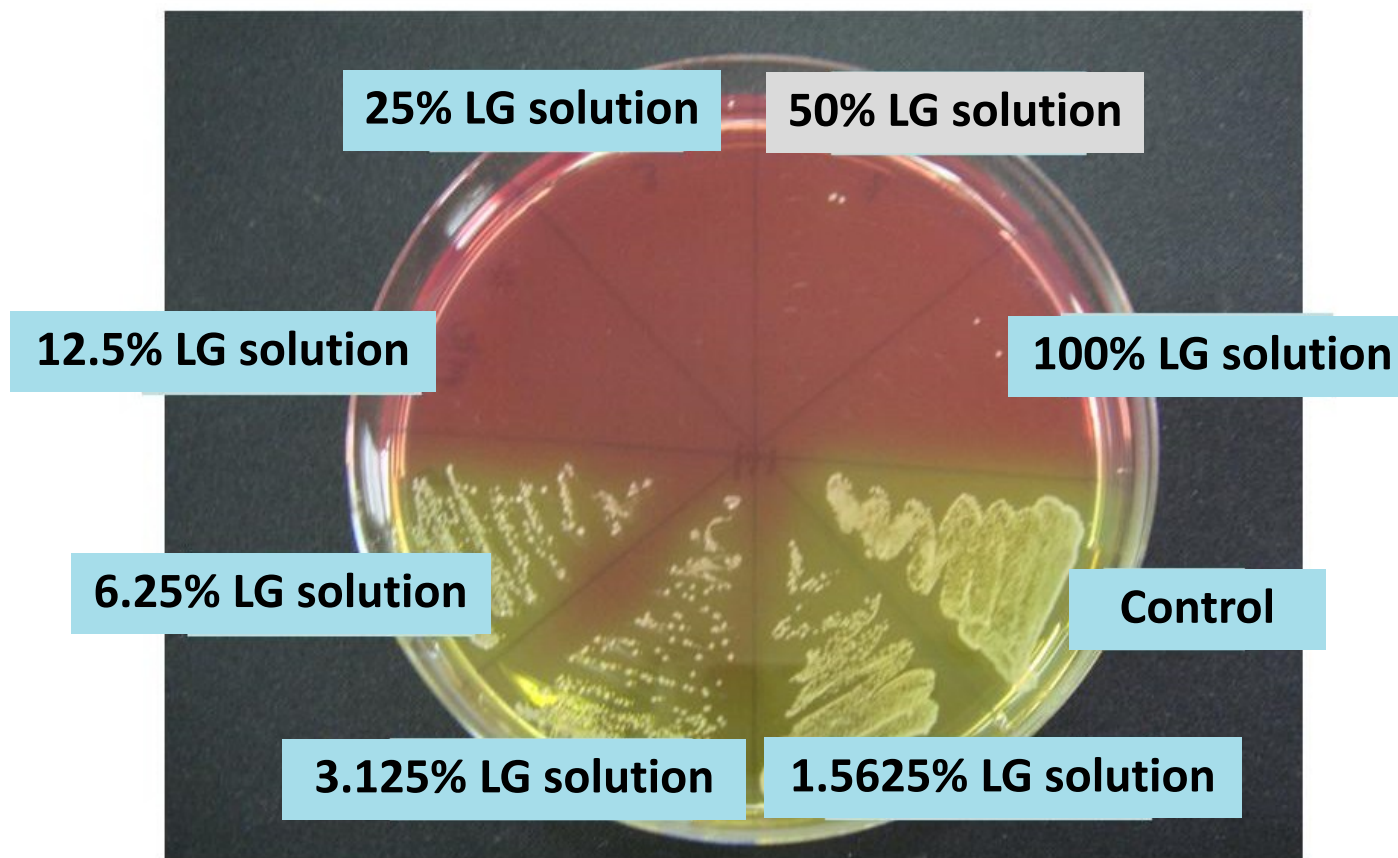
- less irritating to teat skin but their effectiveness against certain forms of minor mastitis-causing pathogen is uncertain.

## ▶ Dodecyl Benzene Sulphonic Acid

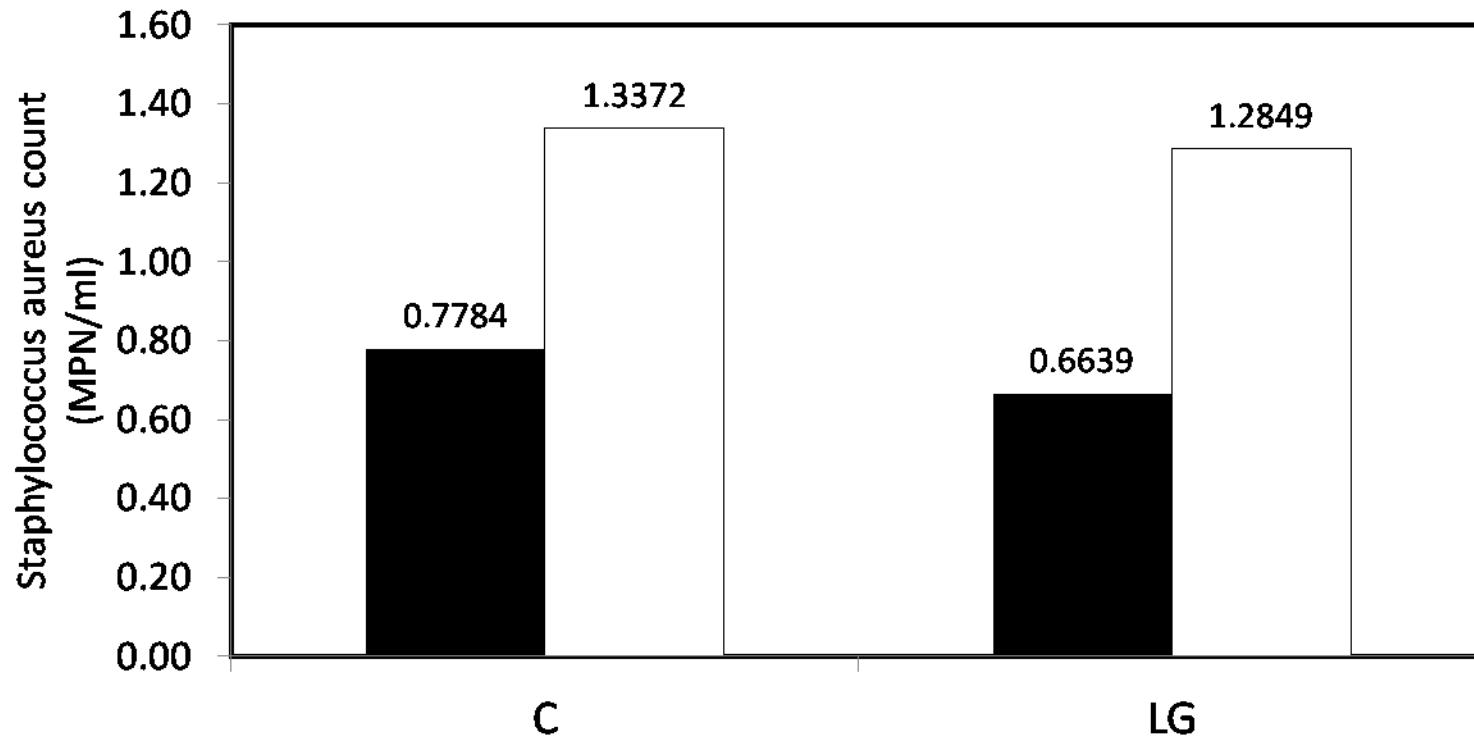
- non-irritant, and
- active against most bacteria but not bacterial spores.
- work well even with a high level of organic contamination.

# Herbal teat dip products

- ▶ Broad spectrum antimicrobial activity
  - Inhibit clinical bacterial isolates from mastitis cow
  - *E. coli*, *S. aureus*, *Strep. agalactiae*, *B. cereus*
- ▶ strong anti-inflammatory agents
  - Inhibit proinflammatory cytokine production
  - Reduce paw edema and leukocyte migration to the peritoneal cavity.
  - Suppress LPS-induced NO production
- ▶ immune stimulants
  - Upon activation with LPS, macrophages are more adept to kill pathogens.

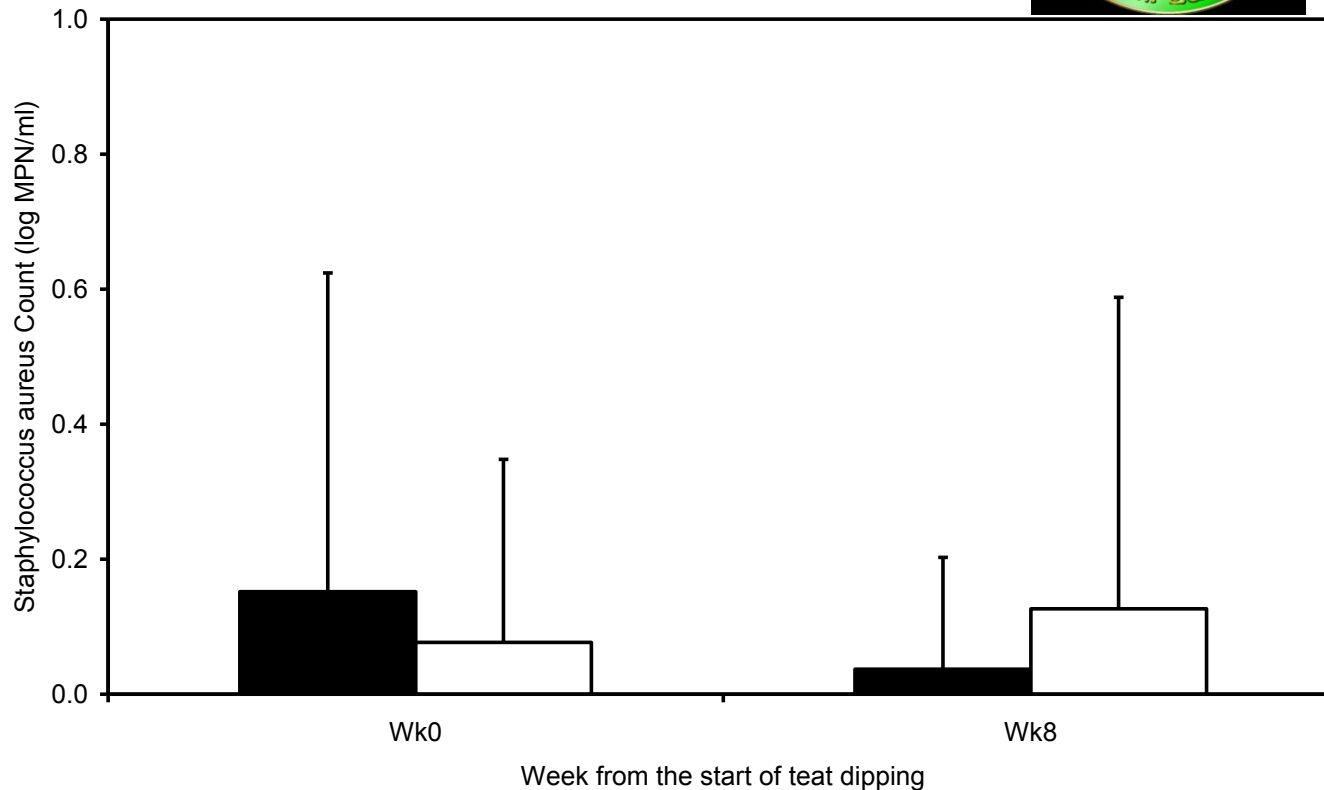


**Figure 2.** Minimum bactericidal concentration (MBC) test of 1% lemongrass volatile oil solution on *Staphylococcus aureus* with various dilution of 100%, 50%, 25%, 12.5%, 6.25%, 3.125% and 1.5625% respectively



**Figure 3.** *Staphylococcus aureus* count (log MPN/ml) in quarter milk samples collected from dairy cows before (■; n = 20) and after (□; n = 20) teat-dipped with iodine solution (C) or with lemongrass volatile oil (LG). *Staphylococcus aureus* count did not differ both between before and after teat dip and also between different dip solution.

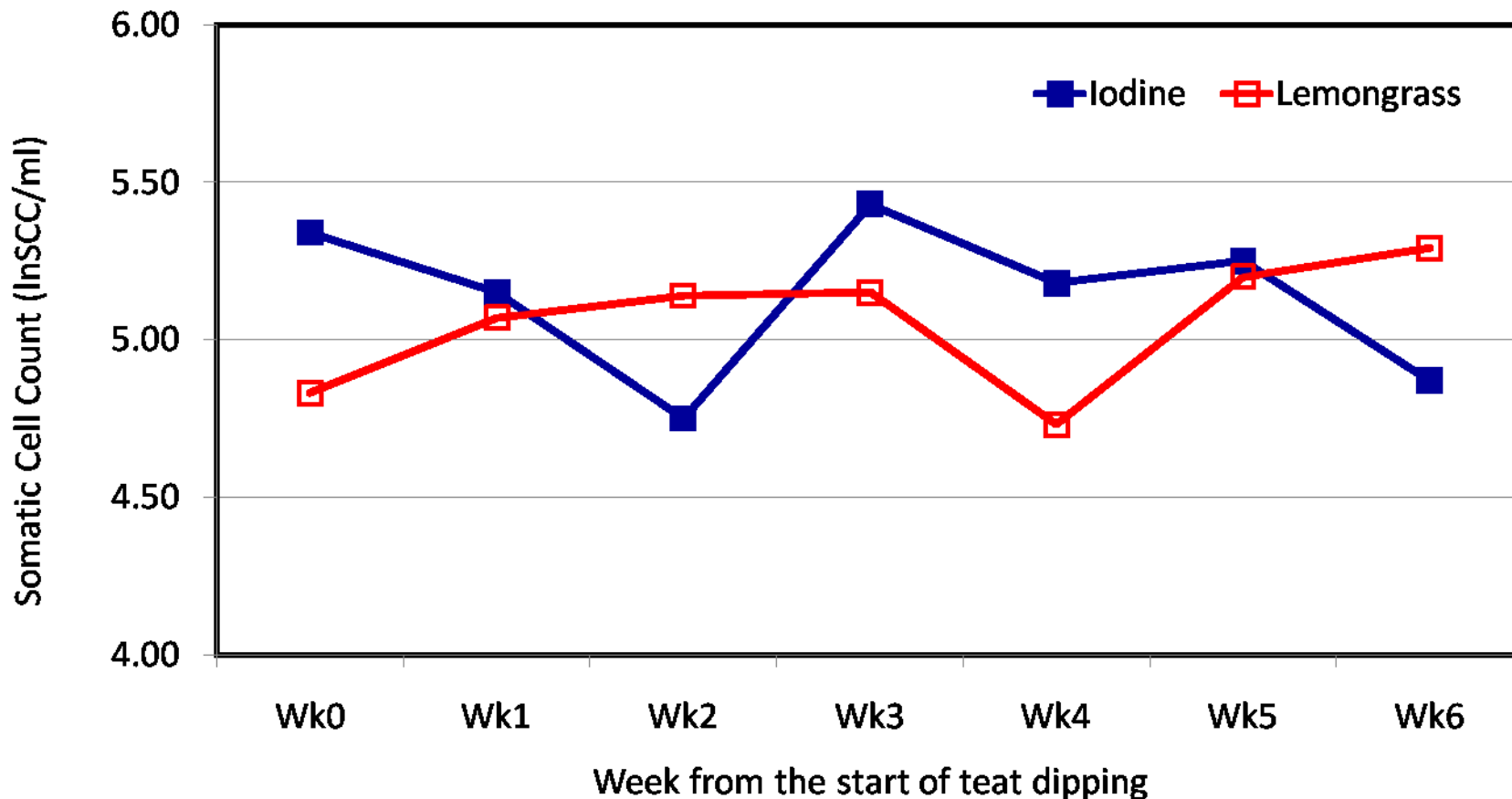
Note: MPN = most probable number.



**Figure 6.** *Staphylococcus aureus* count (log MPN/ml) in composite milk samples collected from dairy cows that were teat-dipped with iodine solution (■) and with lemongrass volatile oil solution (□) at week 0 and 8 from the start of teat dipping in 4 farms (A, B, C and D). *Staphylococcus aureus* count did not differ between the two groups of cows.

Note: MPN = most probable number.





**Figure 12.** Somatic cell count (lnSCC/ml) in composite milk samples collected from dairy cows that were teat-dipped with iodine solution (■) and with lemongrass volatile oil solution (□) at week 0 to week 6 from the start of teat dipping in 4 farms (A, B, C and D). Somatic cell count did not differ between the two groups of cows in any week.



ผลิตภัณฑ์จุ่มเต้านมสัตว์

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