



Animal Health Matters.
For Safe Food Solutions.



Schweizerische Eidgenossenschaft
Confédération suisse
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Swiss Confederation

Federal Department of Economic Affairs,
Education and Research EAER
State Secretariat for Economic Affairs SECO



Establishment of a risk-based food safety control system in the Ukrainian dairy value chain

Somatic Cell Count (SCC) and Total Microbial Count (TMC): what do they mean biologically and financially?

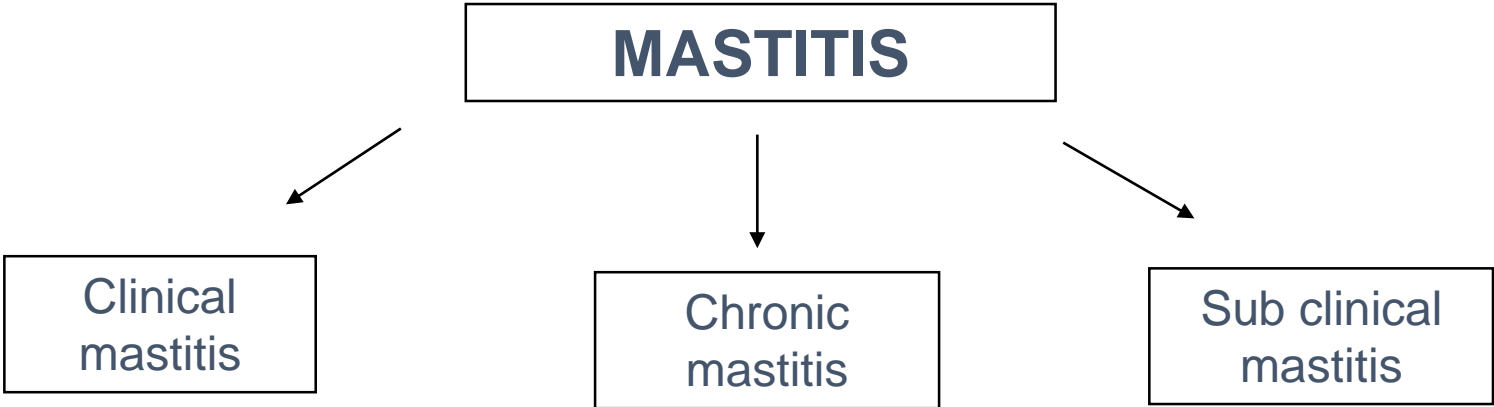
Training of Trainers (ToT), focus: transporters and MCP

Activity 3.1.1.2

Jorge Pinto Ferreira

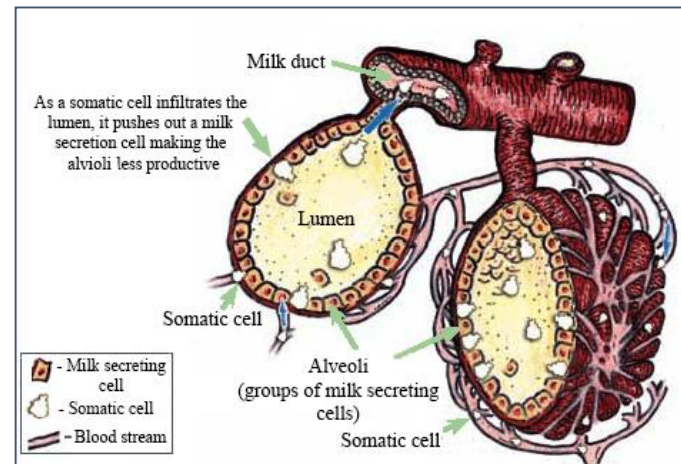
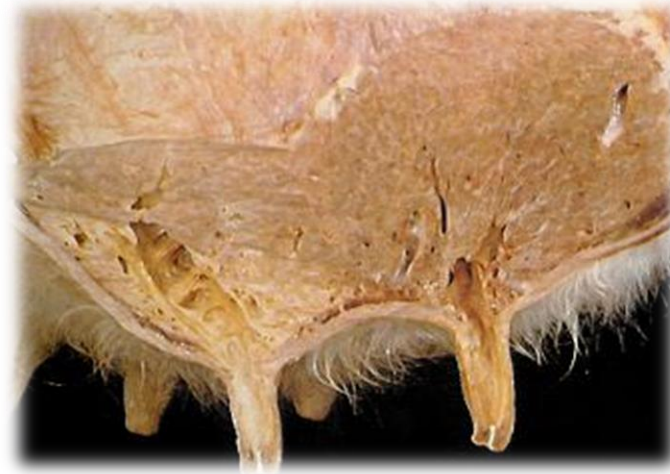
20-22.02.2017

Milking hygiene, *quality* and safety



Somatic cells: what are they?

- mixture of milk-producing cells shed from the udder tissue (about 2%) and cells from the immune system (98%), known as leukocytes (aka white blood cells)
- they are in the udder as a surveillance mechanism = *SCC levels are never zero*
- \uparrow SCC = \downarrow milk production
- lipolytic and proteolytic enzymes = deterioration of milk fat and protein



https://www.icbf.com/wp/?page_id=2718



Milking hygiene, *quality* and safety

Sub-clinical mastitis

- Californian Mastitis Test

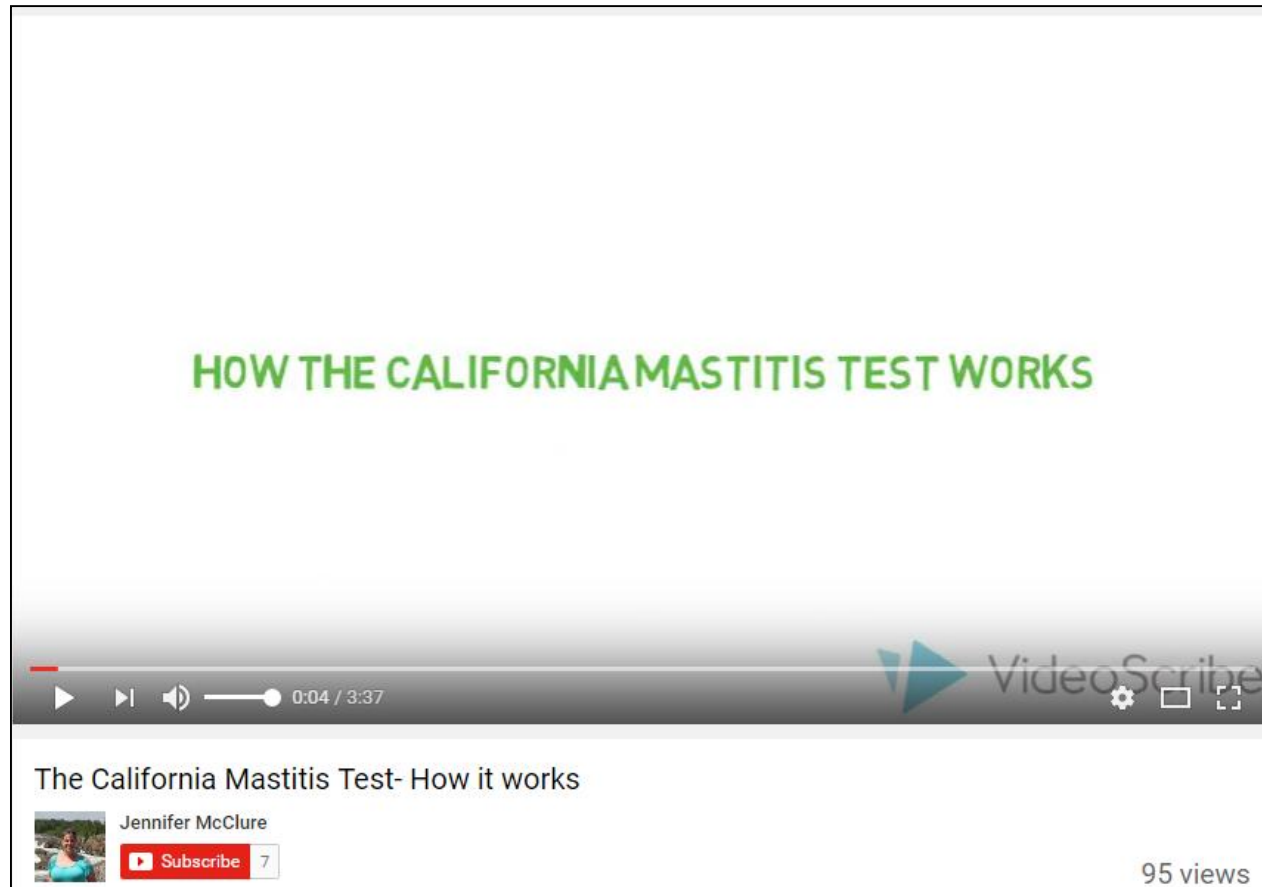


Reaction:

cells releasing DNA when the CMT solution breaks open the cells



CMT



A screenshot of a YouTube video player. The video title is "HOW THE CALIFORNIA MASTITIS TEST WORKS" in green text. The video is by Jennifer McClure, with a "Subscribe" button and a notification of 7 subscribers. The video has 95 views. The player interface shows a progress bar at 0:04 / 3:37, a play button, a volume icon, and a "VideoScribe" watermark.

<https://www.youtube.com/watch?v=twtxPoFkr40>



Milking hygiene, *quality* and safety

Sub-clinical mastitis

Tank SCC	% Production losses	% Infected quarters
200 000	0	6
500 000	6	16
1 000 000	18	32
1 500 000	29	48



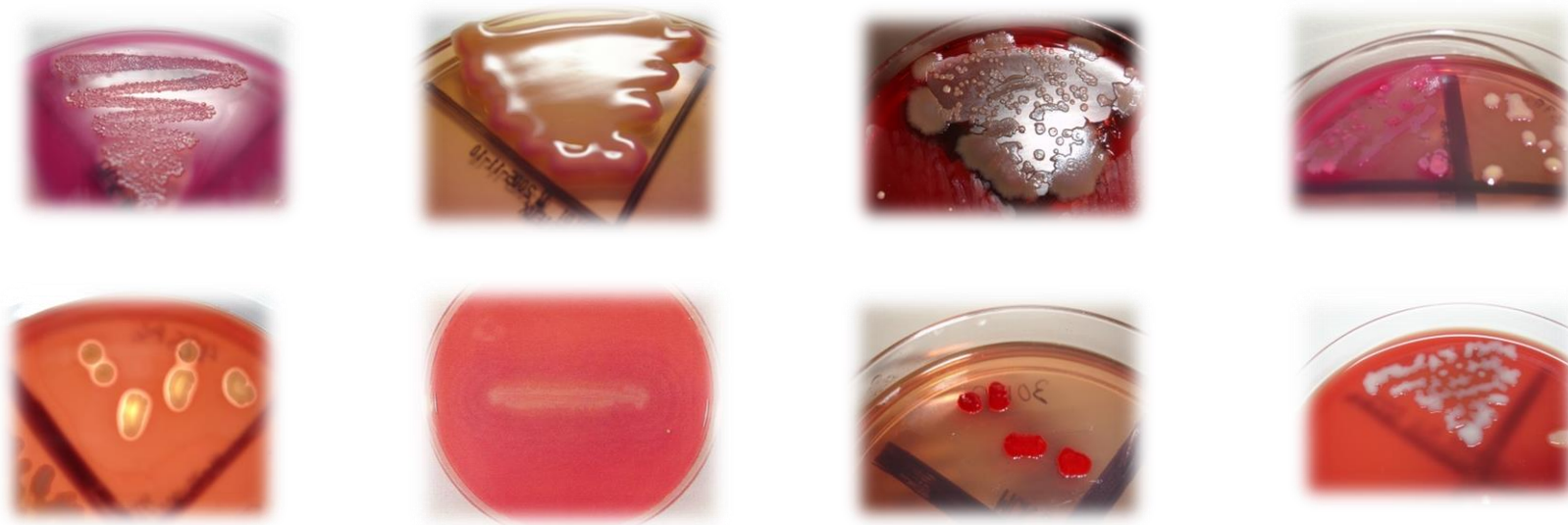
Does high SCC = presence of pathogen?

- Negative growth (25 to 40%):
 - Inhibitors residues presence
 - *S. aureus*; *Mycoplasma* spp...: intracelular “parasites”
 - Microrg. in n.º lower that we can detect (0,01ml de leite – 100 ufc/ml)
 - Aseptic inflammation
 - *Mycoplasma* spp (anaerobiosis)
 - Incorrect storage
 - New agents? “Be a virus, see the world!”

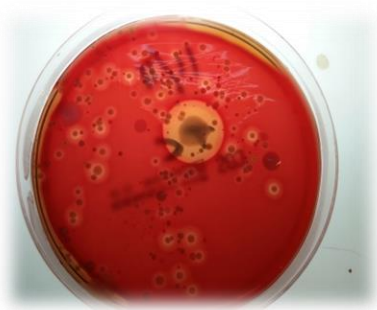


Total Microbial Count (TMC)

- Number of bacteria in a sample that can grow and form countable colonies on Standard Methods Agar after being held at 32°C for 48 hours



The importance of cleaning and hygiene



Which one is *before* and *after* cleaning and disinfection?



What does this mean financially?

Data from Ukraine



	SCC	TMC	Price (UAH) 01.11.2016	Max. price (UAH) 01.11.2016
Extra	< 400	< 100	7.21	8.3
Premium	< 400	< 300	7.2	8.13
I Grade	< 600	< 500	6.89	7.5
II Grade	< 800	< 3000	4.95	5.31



What does this mean financially?

An example from Portugal



SCC	€
< =300.000 (baseline)	0,000
<= 400.000	- 0,0090
> 400.000	- 0,0450

TMC	€
< =50.000 (baseline)	0,000
<= 100.000	- 0,0150
> 100.000	- 0,0450



What does this mean financially?

An example from Switzerland



An award is paid if all the limits are fulfilled in the same month:

$TMC < 10.000 \text{ cfu/mL} + SCC < 100.000 \text{ cells/mL} + \text{no inhibitors} = \text{plus CHF } 0.005$

SCC and TMC	CHF
1st complaint in 5 months	- 0.01
2nd complaint in 5 months	- 0,03
3rd complaint in 5 months	- 0,06
4th complaint in 5 months	- 0.12
5ht complaint in 5 months	- 0.24 plus block



Conclusions:



- SCC are mostly leukocytes = defense cells
- TMC = number of bacteria in a sample that can grow and form countable colonies on standard methods agar (32°C, 48h)
- SCC and TMC can have a significant financial impact





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Thank you for your attention

jorge.pinto-ferreira@safoso.ch



Swiss-Ukrainian Project

“Establishment of a risk-based food safety
control system in the dairy value chain in Ukraine”

Tel.: [+38 044 279 87 12](tel:+380442798712) (13) Fax: [+38 044 279 88 45](tel:+380442798845)

Address: 1, 10, Malopidvalna Str., Kyiv, Ukraine

Web: www.safoso.ch; safoso.com.ua