



Animal Health Matters.
For Safe Food Solutions.



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Bovine Tuberculosis

Viktoria Lets (NLE, SAFOSO, MSP)

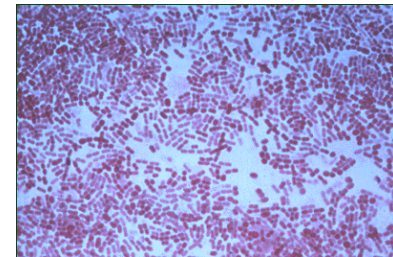
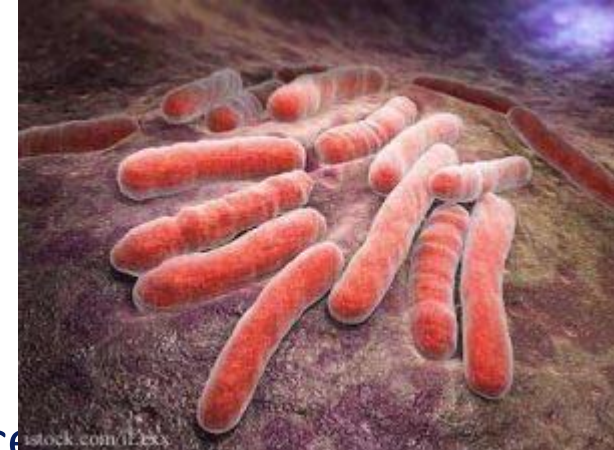


Bovine Tuberculosis

is a contagious disease of both animals and humans

Bacterium: *Mycobacterium bovis*

- Unique bacteria
- Cell walls contain a lot of waxy material (mycolic acid)
 - inhibits the uptake of nutrients into the bacterial cell
 - causes the cell to clump
 - these factors contribute to the slow growth rate
- Mycobacteria do not grow outside of a host except in cultured media
 - Slow growth rate
- Require oxygen for growth
- **Very heat sensitive:** pasteurization “kills” the M.bovis
- Can remain viable for extended periods of time in cold weather



Risk factors for bovine tuberculosis

- livestock systems (extensive, intensive),
- breeds (local, exotic, cross-breed),
- herd size,
- age,
- cattle movement,
- ecological and geographic factors,
- farm structures,
- farm management practices,
- bovine TB control and eradication programmes,
- regional TB incidences,
- wildlife densities,
- occurrence of TB on contiguous premises and/or level of TB in surrounding areas (infection pressure)



<https://www.visavet.es/bovinetuberculosis/bovine-tb/diagnosis.php>

<http://www.landcareresearch.co.nz/publications/newsletters/kararehe-kino/kararehe-kino-23/dispersal-of-a-non-motile-species>

Bovine Tuberculosis

Signs of illness

- Slowly progressive disease
- Early stage: Asymptomatic
- Late stage:
 - weight loss
 - anorexia
 - cough
 - difficulty breathing



<http://dr.klinikbtp.com/symptoms-for-tuberculosis-in-cattle/>

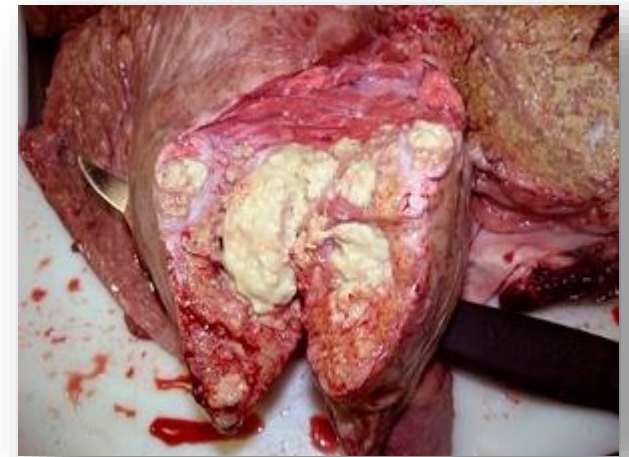


<http://medlec.org/lek-46285.html>



Bovine Tuberculosis

- Bovine tuberculosis primarily affects the upper (tonsils and draining lymph nodes) and lower (lungs and draining lymph nodes) respiratory tract, and intestinal tract (ileo-jejunum and draining nodes) of cattle.
- Only approximately **1%** of animals suffer from infected **udders (mastitis)** (Collins, 2000). *M. bovis* cells are shed in large numbers directly from infected mammary tissue into the milk.

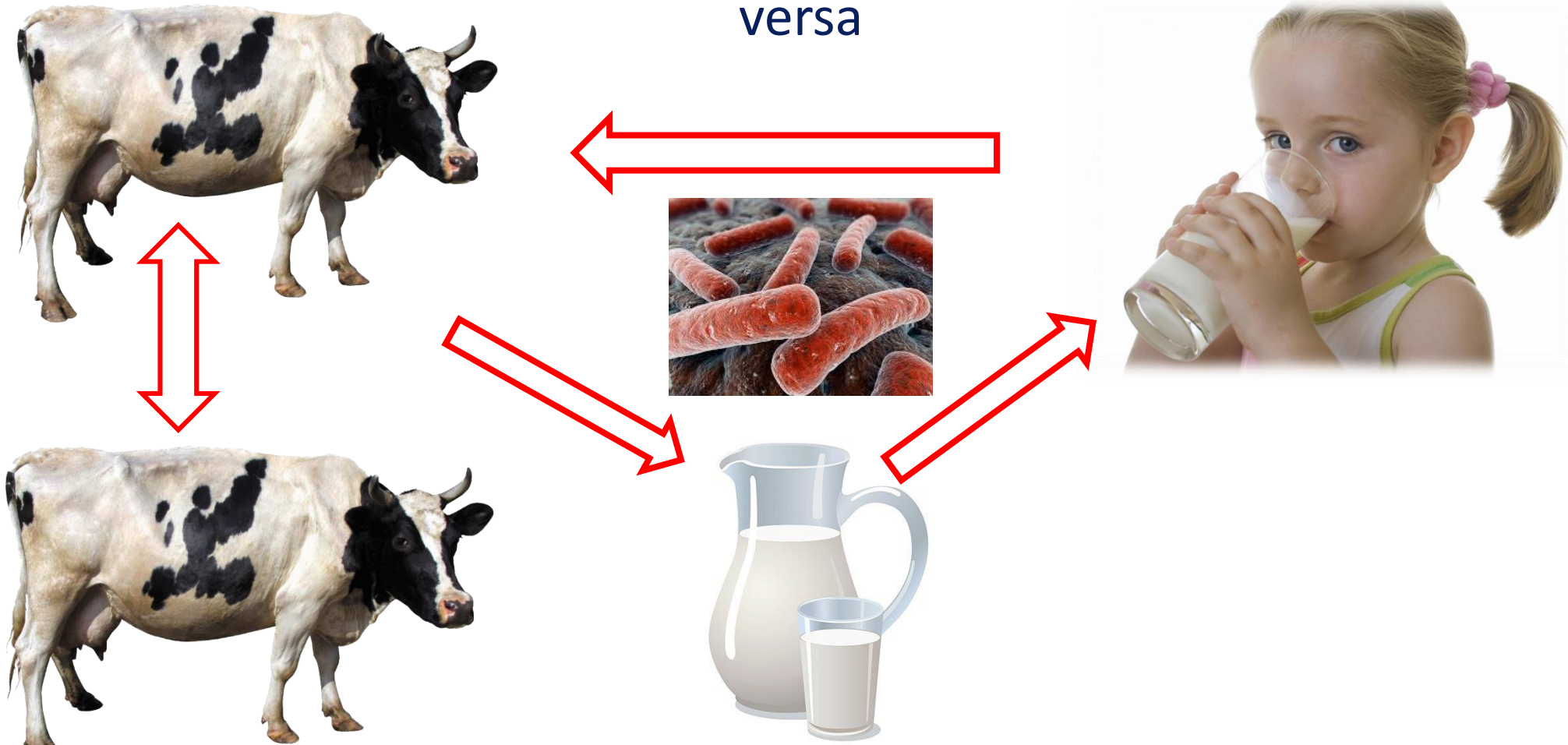


<http://veterinariostaurinos.blogspot.com/2010/12/las-ganaderias-de-lidia-en-peligro-de.html>
<http://bmeditores.mx/tuberculosis-bovina/>



Bovine Tuberculosis

Can be transmitted from animals to humans and vice versa



<http://www.kewo-science.com/tuberculosis-the-second-greatest-killer-worldwide/>

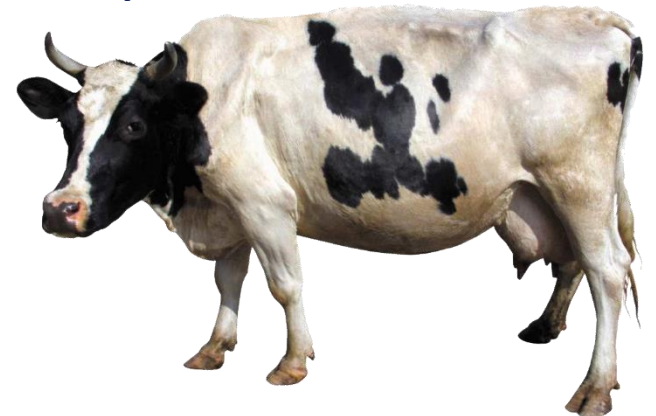
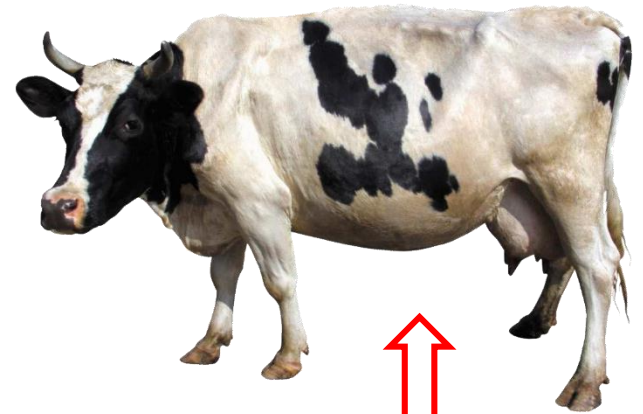
<http://www.sympaty.net/20131001/rebenok-ne-est-molochnye-produkty/>

Bovine Tuberculosis

Transmission in animals

Cattle = reservoir hosts

- Aerosol
- Ingestion (calves)
- Cutaneous, genital, congenital (rare)
- Asymptomatic carriers occur



Bovine Tuberculosis

Transmission in humans

- Ingestion
 - Unpasteurized dairy products
 - Raw or undercooked meat
- Aerosol
- Breaks in the skin
- Person-to-person
 - Rarely
 - Immunosuppressed



<http://www.sympaty.net/20131001/rebenok-ne-est-molochnye-produkty/>



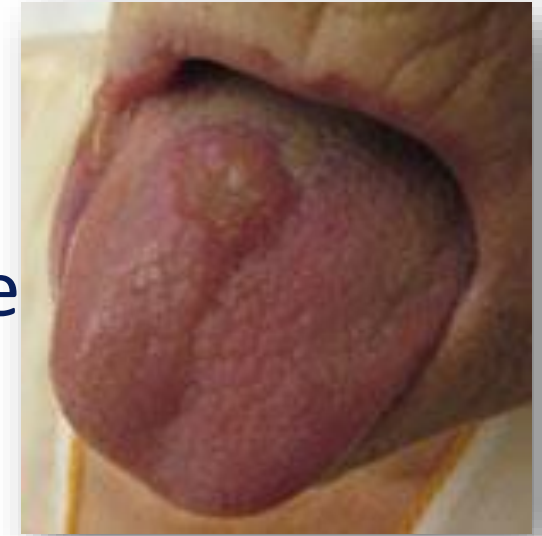
Tuberculosis in People

- In the Ukraine, the majority of tuberculosis (TB) cases in people are caused by *Mycobacterium tuberculosis* (*M. tuberculosis*).
- ***Mycobacterium bovis*** (*M. bovis*) is another *mycobacterium* that can cause TB disease in people.
- In people, *M. bovis* causes TB disease that can affect the lungs, lymph nodes, and other parts of the body.



Tuberculosis in People

- Higher incidence
 - Countries with uncontrolled bovine
 - Occupational risk groups
- Clinical manifestations
 - Asymptomatic
 - Localized lymphadenopathy
 - Skin disease
 - Pulmonary disease



How common is *M. bovis* in people?

For example:

- *M. bovis* causes a relatively small proportion, less than 2%, of the total number of cases of TB disease in the United States.
- Accounts for less than 230 human TB cases per year in the United States.
- *M. bovis* transmission from cattle to people was once common in the United States. This has been greatly reduced by decades of disease control in cattle and by routine pasteurization of cow's milk



How common is *M. bovis* in people?

For example:

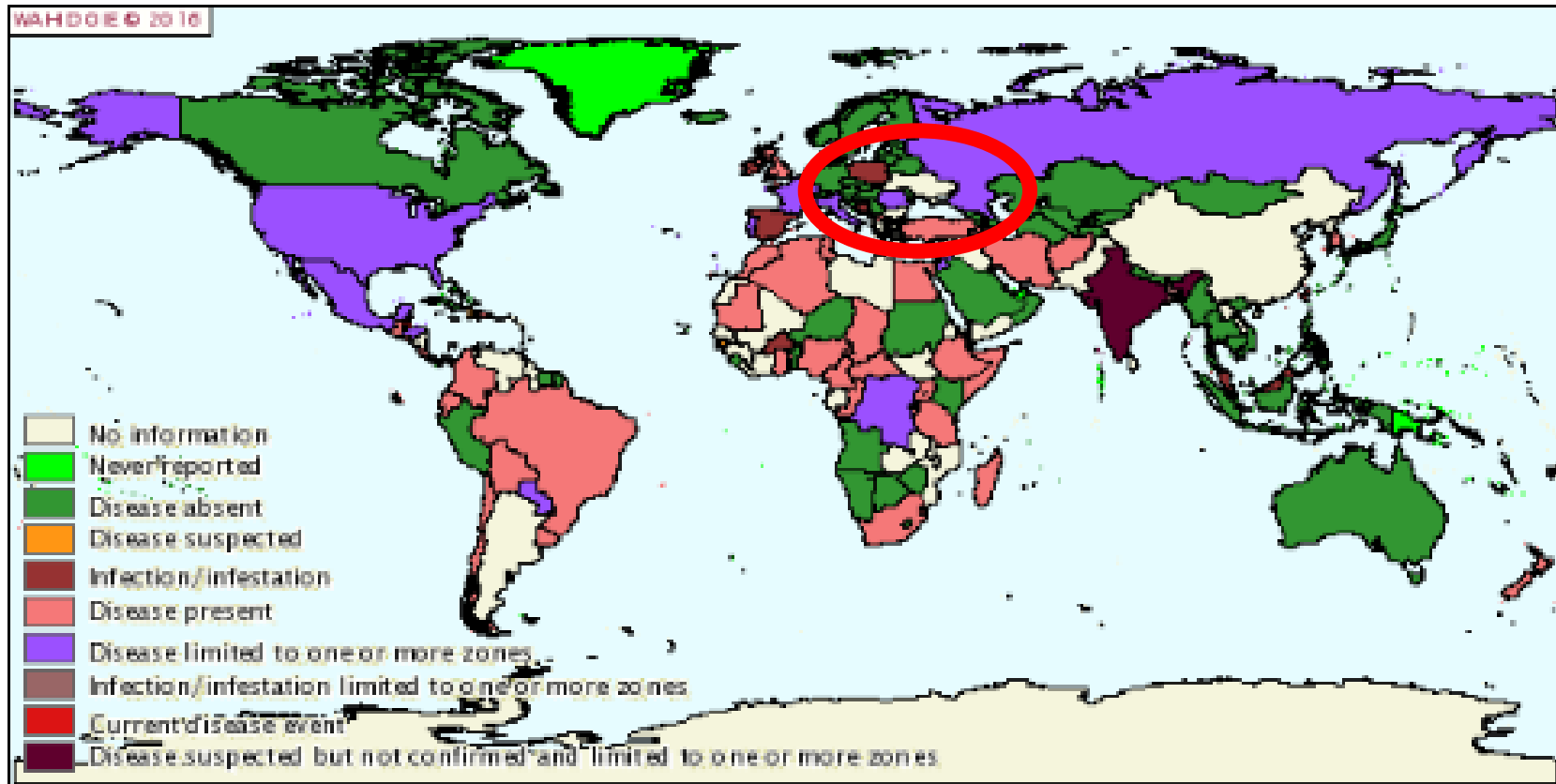
- The incidence of tuberculosis in New Zealand in 2007 (including reactivations) was 6.9 per 100,000 population.
- The proportion of total tuberculosis cases in recent years estimated to be caused by *M. bovis* in New Zealand (1-3%) is similar to other developed countries.



Bovine Tuberculosis

Distribution of bovine tuberculosis in world
for the period June-December, 2015, OIE

Disease distribution maps



Bovine Tuberculosis

Distribution

- Once worldwide
 - Control programs established
 - Many regions now free of bovine TB
- Ukraine
 - Control programs established
 - Last cases was in 2015 year



Bovine Tuberculosis

Dynamics of bovine tuberculosis in Ukraine for the period 2010-2015

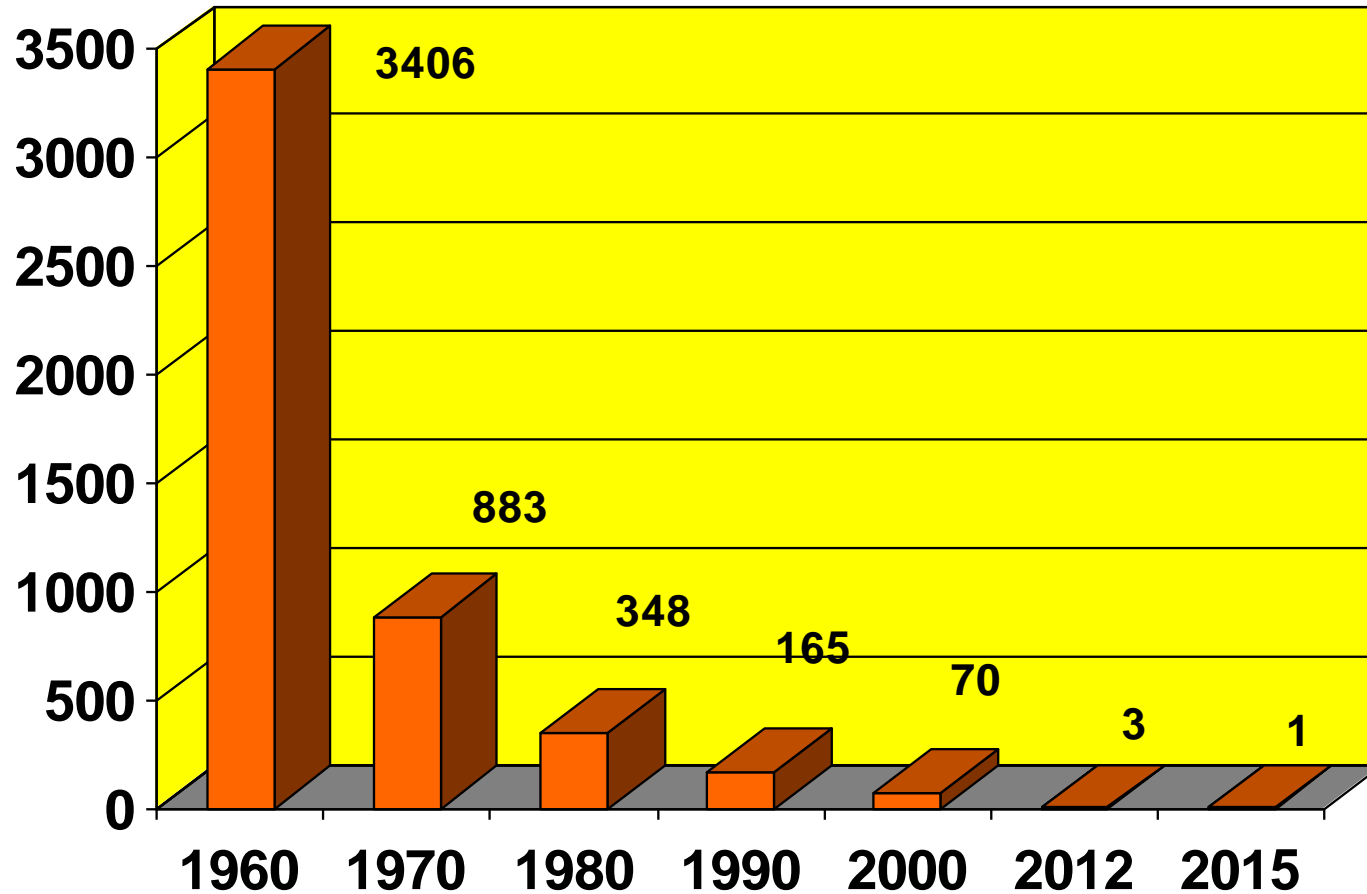
years	Number in the beginning of year	Detected during the reporting period		recovered	Remains at the end of the reporting period	
		№	sick animals		№	sick animals
2015	1	1	31	1	1	
2014	1	1	89	1	1	
2013	1	1	323	1	1	
2012	3	1	311	3	1	
2011	2	4	252	3	3	
2010	2	3	240	3	2	

Since the beginning of 2016 were made 934 200 allergic tuberculosis research.

On 01.06.2016 the territory of Ukraine is free from tuberculosis.



Bovine Tuberculosis



The presence of households disadvantaged on tuberculosis in Ukraine for the period from 1960 to 2015



Bovine Tuberculosis

The prevalence of *M. bovis* in raw milk depends on:

- The prevalence of *M. bovis* infection in dairy cattle
- The spread of bacteria from the primary and secondary sites of infection (complexes), which are principally located in the lymph nodes, into mammary tissue (milk).



Bovine Tuberculosis

Veterinary World, EISSN: 2231-0916
Available at www.veterinaryworld.org/Vol.6/Dec-2013/9.pdf

RESEARCH ARTICLE
Open Access

Prevalence of tuberculosis among southern Zambian cattle and isolation of *Mycobacterium bovis* in raw milk obtained from tuberculin positive cows

Girja S. Pandey¹, Bernard M. Hang'ombe¹, Festus Mushabati² and Andrew Kataba¹

1. School of Veterinary Medicine, University of Zambia, PO Box 32379, Lusaka, Zambia

2. School of Medicine, Copperbelt University, PO Box 71191, Ndola, Zambia

Corresponding author: Girja S. Pandey, email: pandeygs@gmail.com

Received: 24-09-2013, Revised: 04-11-2013, Accepted: 06-11-2013, Published online: 18-12-2013

doi: 10.14202/vetworld.2013.986-991 **How to cite this article:** Pandey GS, Hang'ombe BM, Mushabati F and Kataba A (2013) Prevalence of tuberculosis among southern Zambian cattle and isolation of *Mycobacterium bovis* in raw milk obtained from tuberculin positive cows, *Veterinary World* 6(12): 986-991.

- From 1025 cows 27 (2.6%) of the cows tested were found tuberculin reactors, 9 cows (0.87 %) gave inconclusive reaction and 989 (96.48%) were non-reactors.
- Three milk samples (18.7%) out of the 16 tuberculin reactor cow's milk when cultured and upon molecular analysis, were found positive for presence of *M. bovis* indicating these positive cows were shedding *M. bovis* in their milk



Bovine Tuberculosis

See discussions, stats, and author profiles for this publication at:
<https://www.researchgate.net/publication/223467812>

Risk assessment in zoonotic tuberculosis in Mbarara, the main milk basin of Uganda

Article in Bulletin of animal health and production in Africa. Bulletin des santé et production animales en Afrique · November 2010

DOI: 10.4314/bahpa.v58i2.62046



Imported food risk statement Raw milk cheese and *Mycobacterium bovis*

Commodity: Cheese that has not undergone a heat treatment step (such as pasteurisation, thermisation with additional hurdles or high temperature curd cook) during production. A raw milk cheese must not support the growth of pathogenic microorganisms and have no net increase in pathogen levels during the manufacture of the cheese.

Microorganism: *Mycobacterium bovis*





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Thanks!