Paratuberculosis - prehľad

Slovakia, March 6, 2012

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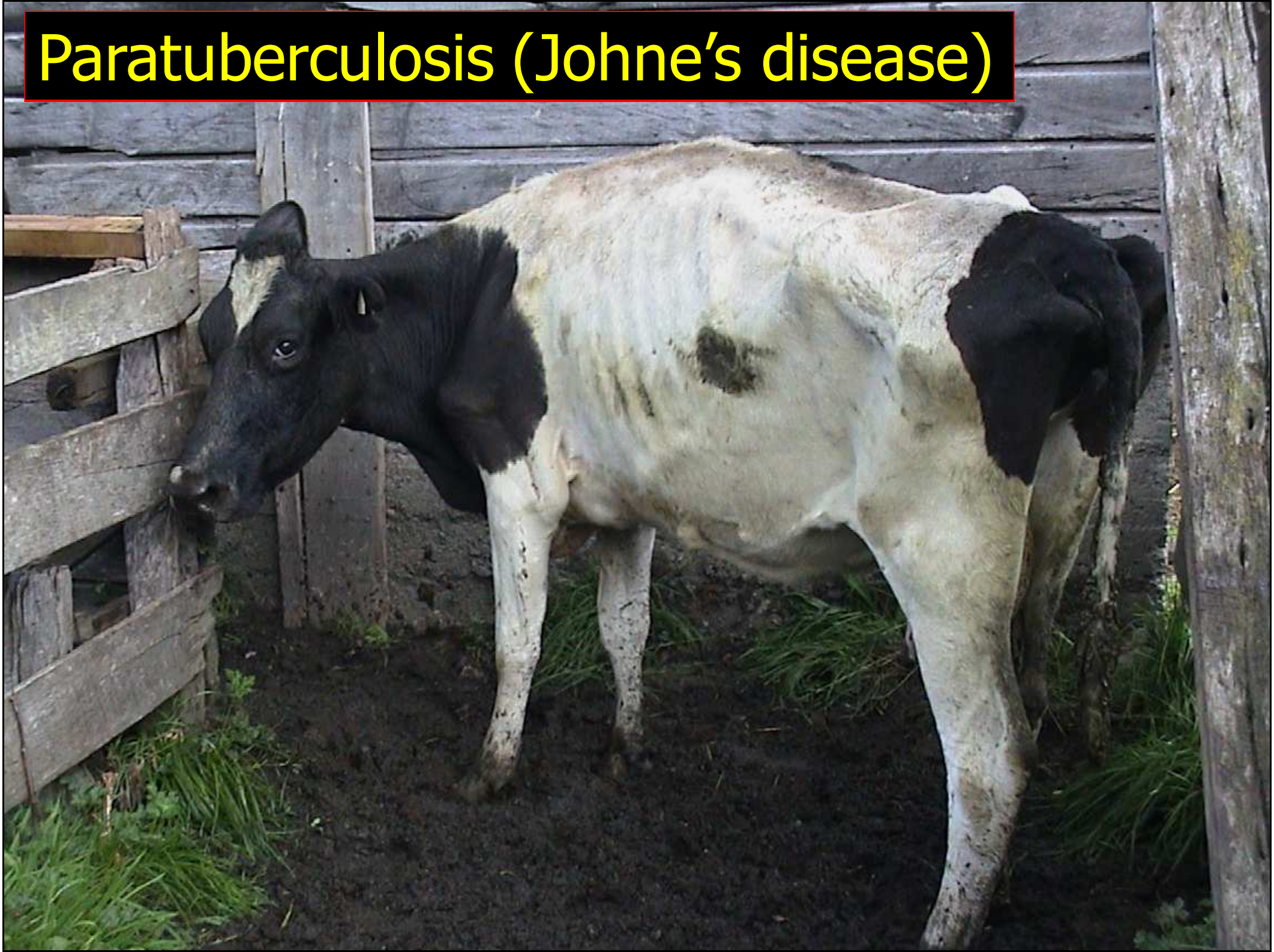
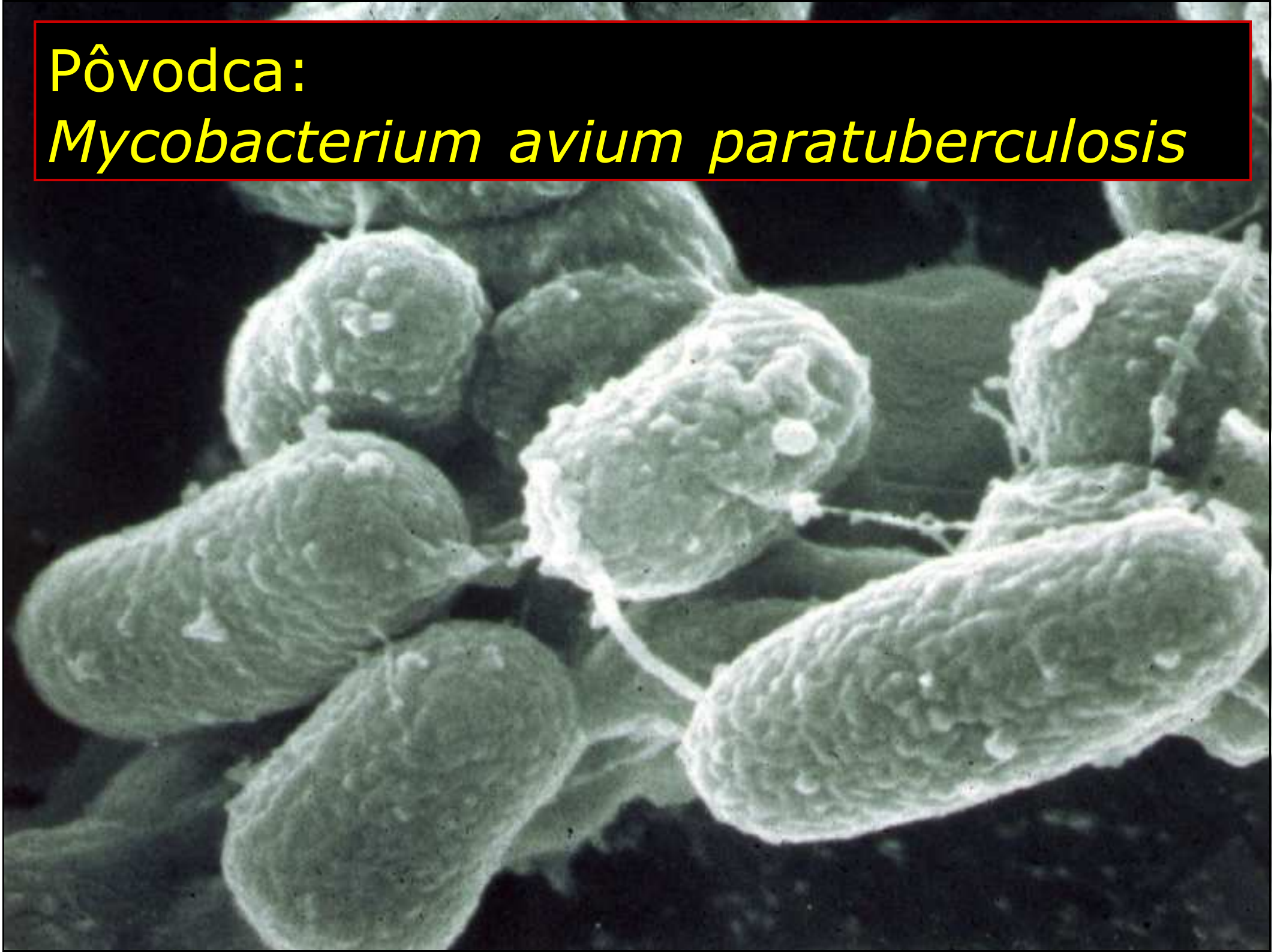
SCHOOL OF VETERINARY MEDICINE
University of Wisconsin-Madison

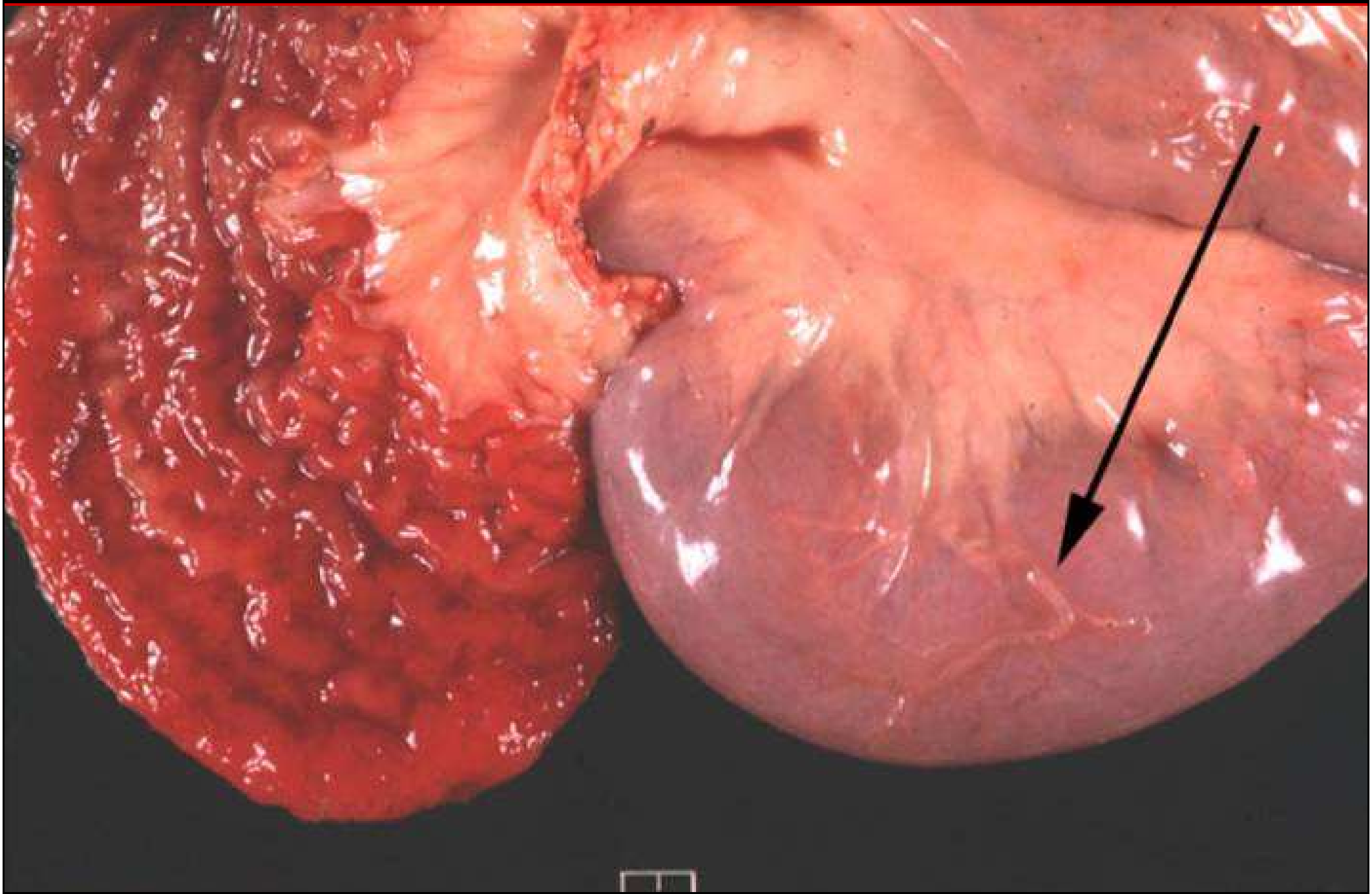
Paratuberculosis (Johne's disease)



Pôvodca:
Mycobacterium avium paratuberculosis



Výsledok: poškodené črevo



Clinical Johne's disease

Austrálske údaje zo 179 stád

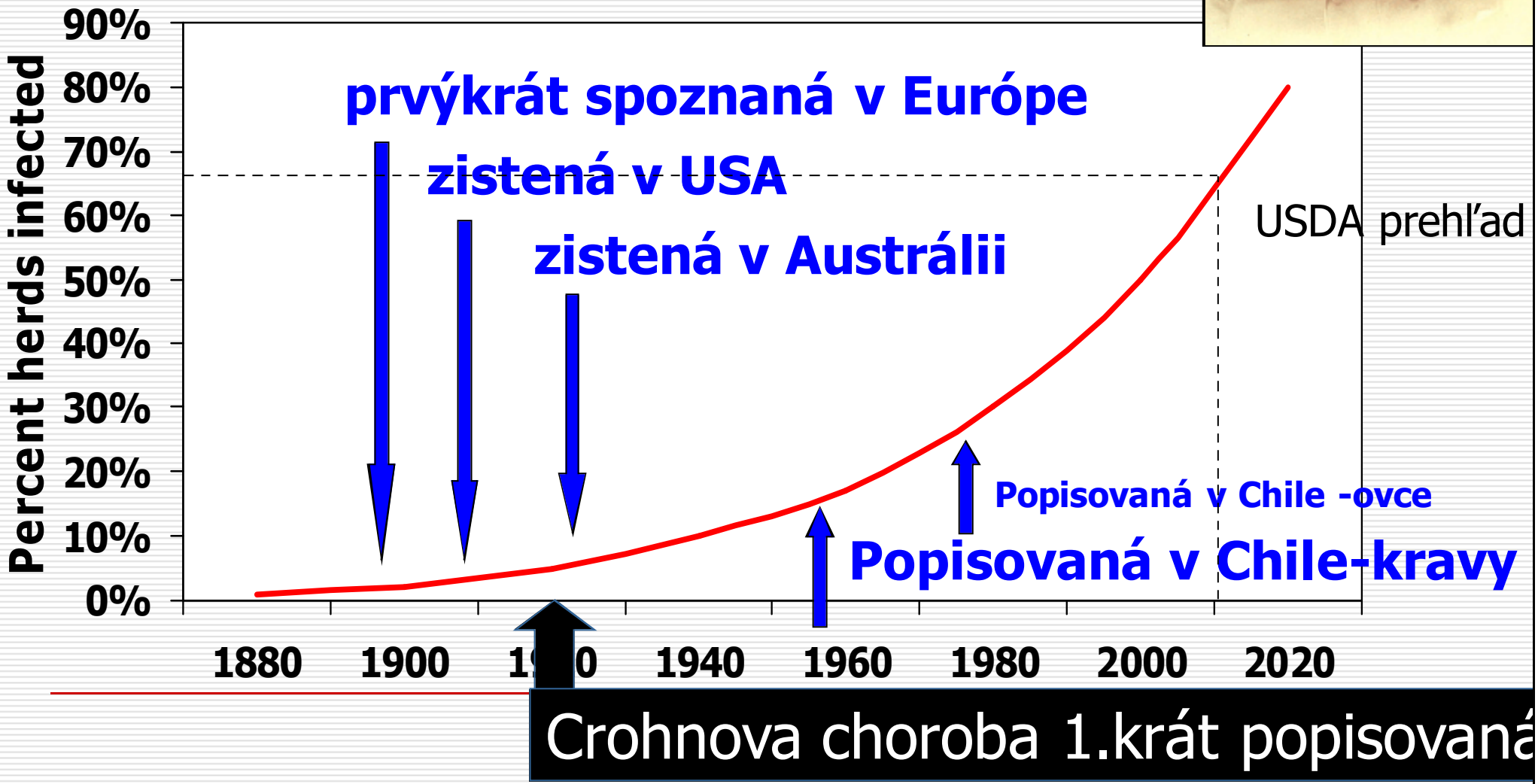
stredná inkubačná doba = 5 rokov

Fľašková sánka- klasický príznak

(tiež názov „submandibulárny edém“)

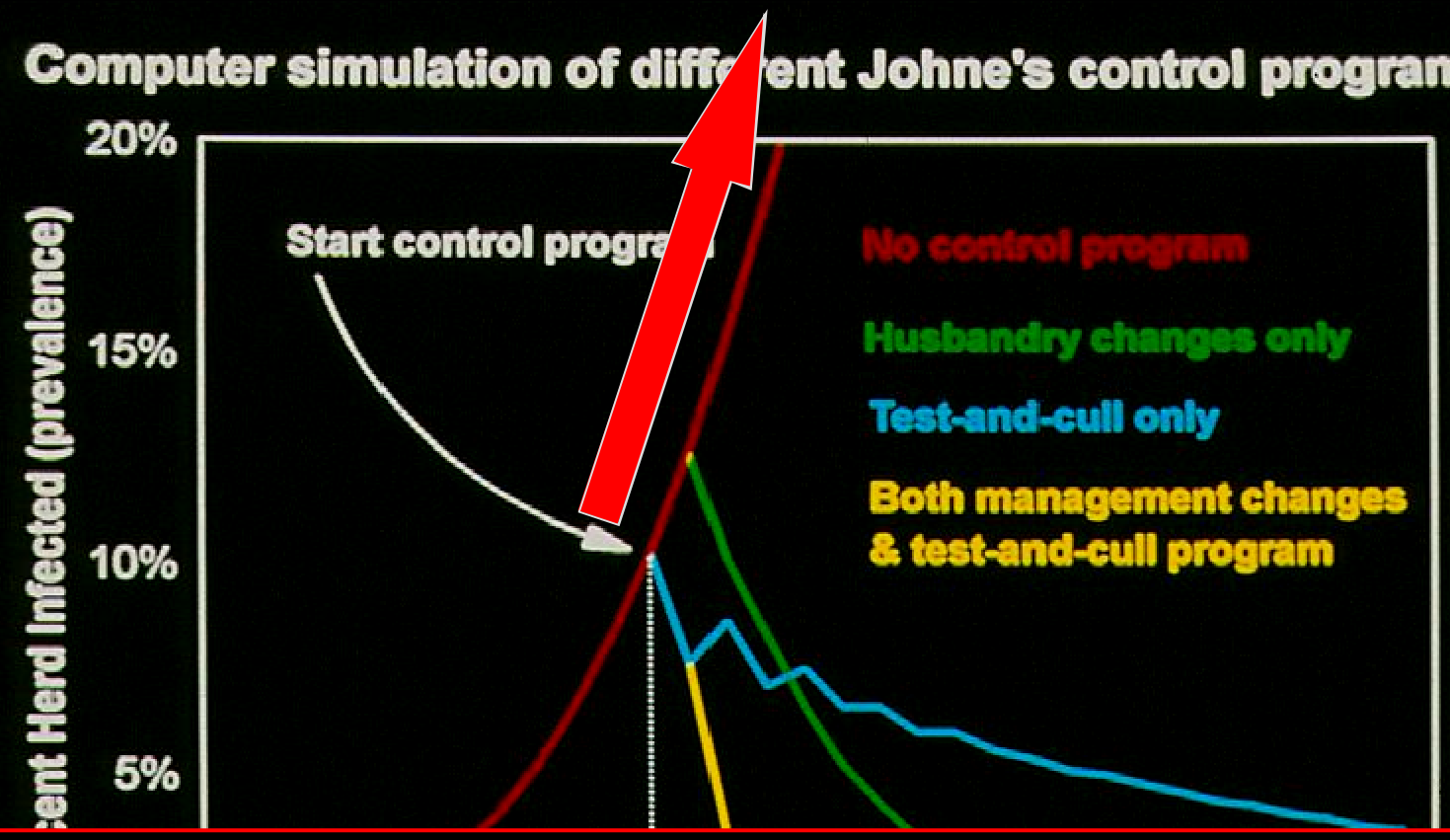
Paratuberculosis je bežná & prenosná

Global Epidemic



Johne’s disease je globálny problem.

Johne's šírenie v stáde!



Poučenie:
Máte na výber čo robiť, ale NIEČO robiť musíte!

Paratuberculosis

Znižuje mliečnu produkciu

Paratuberculosis znižuje produkciu

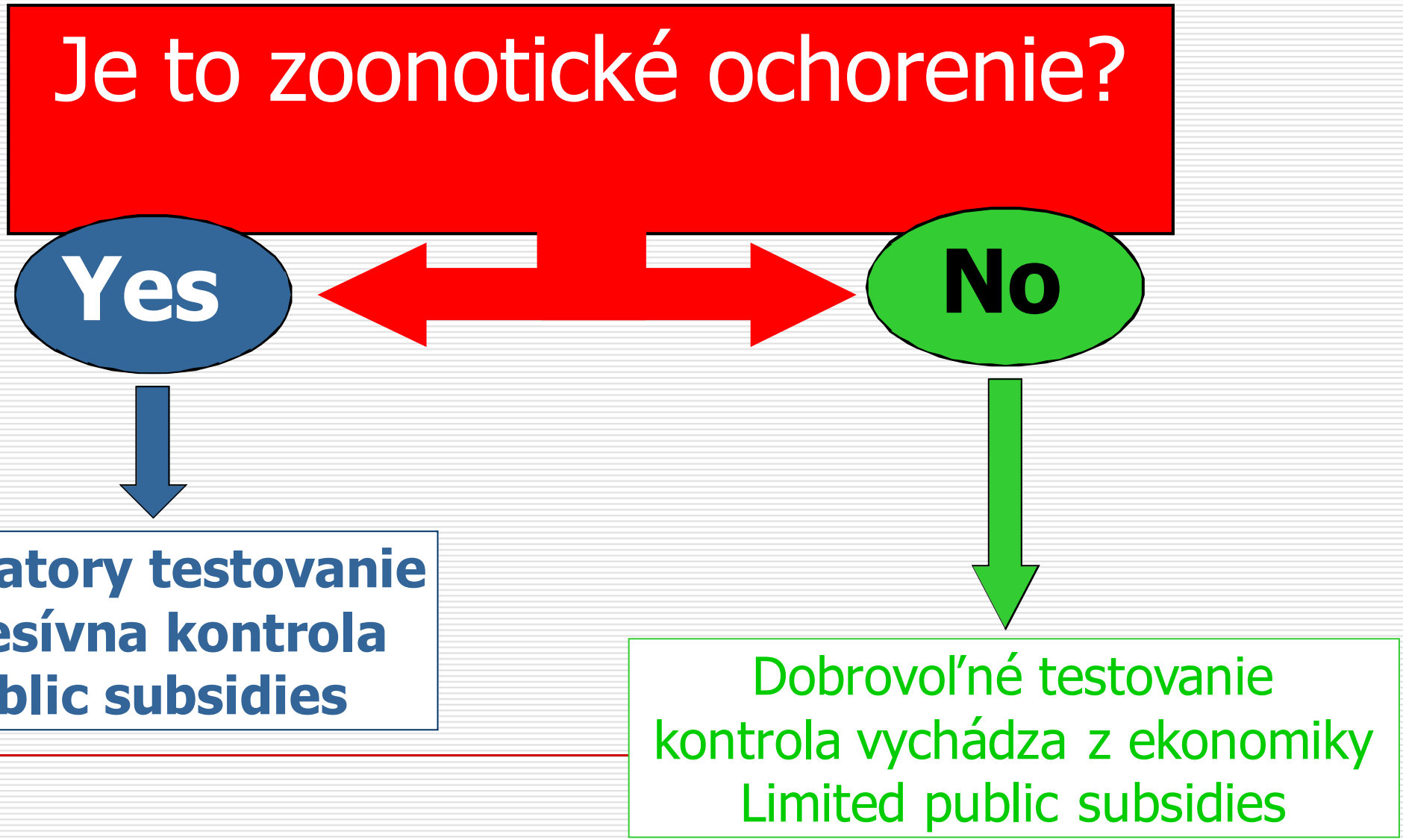
Produčný Parameter	ELISA výsledok		
	Negatívny, nízko-pozitívny Pozitívny	vysoký (Silne) Pozitívny	
ME305 MILK	**21,327 lb[a]**	**18,631 lb[b]**	**-2,696 lb**
	(9,694 Kg)	**(8,467 Kg)**	**-1,225 Kg**
Laktačné dni	**344[a]**	**290[b]**	**-54 DIM**

Hodnoty s inými označeniami sú signifikantné odlišné $p<0.05$

Lombard et al. JAVMA Dec 15, 2005

Možná Zoonóza?

MAP križovatky

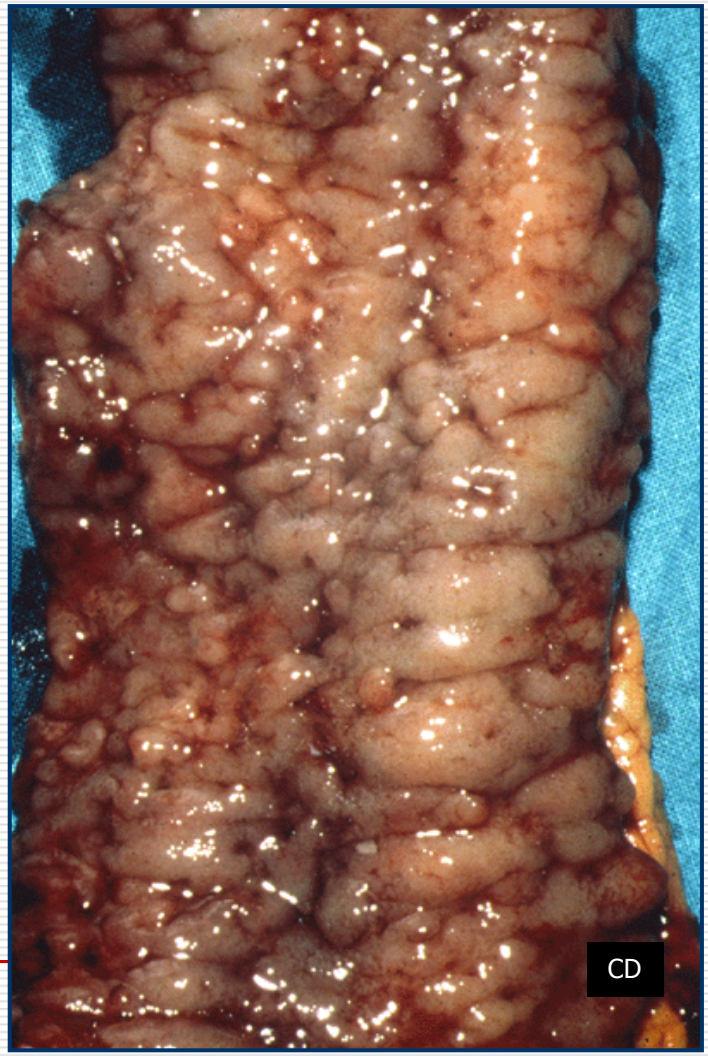


Johne’s disease – Crohn’s disease
podobné klinické prejavy

Objavenie sa pri pohlavnom dospievaní
Diarrhea
Strata hmotnosti
Abdominálne bolesti
Chronicita
Debilitating
Progresivita

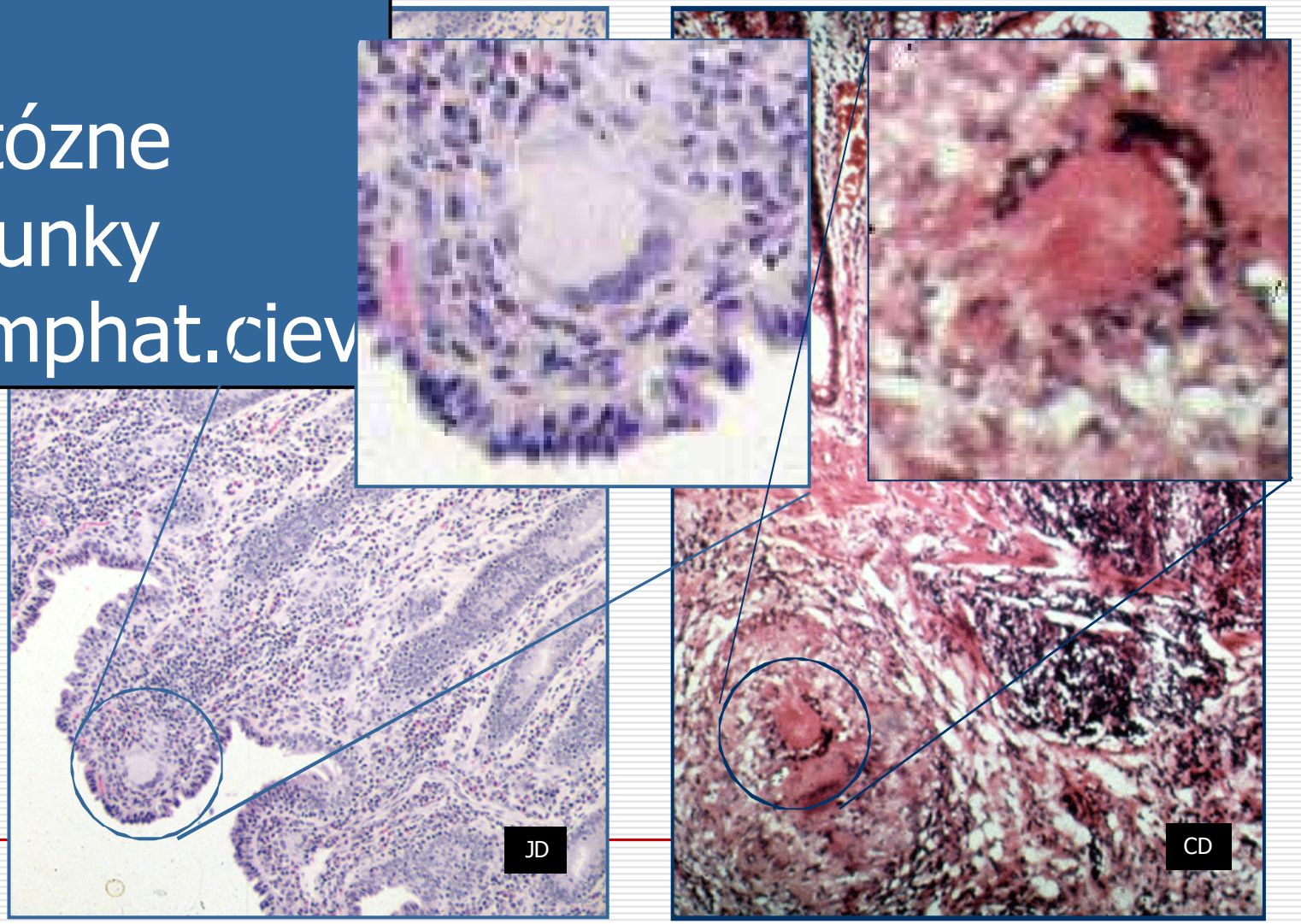
Johne’s disease – Crohn’s disease **podobná hrubá patológia**

zhrubnutá
Corrugated
ne-ulcerovaná



Johne’s disease – Crohn’s disease
podobná histopatológia

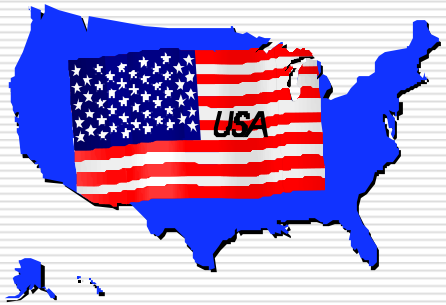
Diffúzne
Granulomatózne
Obrovské bunky
Dilatácia lymphat.ciev



Prevalence of Crohn's Disease in No. America

Incidence (8-10/100,000) is misleading

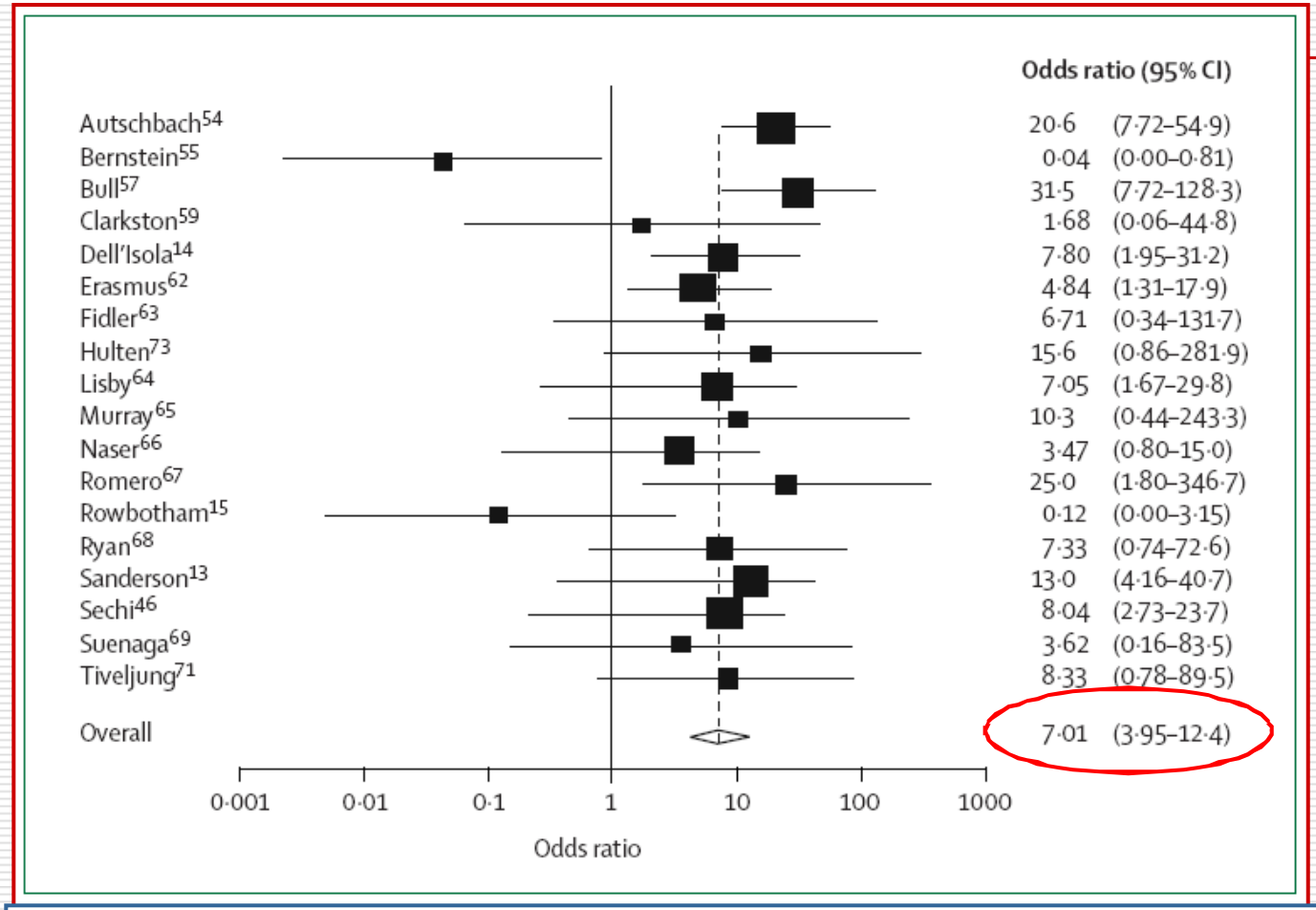
- USA: 133 per 100,000
  - **1 in 752 people**



MAYO CLINIC

Loftus et al., Gastroenterology, 114:1161-1168, 1998.

"Prepojenie *MAP* a Crohn-ovej choroby, zistené podľa PCR V ELISA testov, je zjavné a pochybujeme, že nové významné zistenia môžu byť získané z ďalších štúdií…."



Mycobacterium avium subspecies *paratuberculosis* and Crohn's disease: a systematic review and meta-analysis

September, 2007

Martin Feller, Karin Huwiler, Roger Stephan, Ekkehardt Altpeter, Aijing Shang, Hansjakob Furrer, Gaby E Pfyffer, Thomas Jemmi, Andreas Baumgartner, Matthias Egger

World Journal of Gastroenterology

Online Submissions: http://www.wjgnet.com/1007-9327office
wjg@wjgnet.com
doi:10.3748/wjg.v16.i36.4558

World J Gastroenterol 2010 September 28; 16(36): 4558-4563
ISSN 1007-9327 (print)

High prevalence of via
***paratuberculosis* in Cr**

Juan L Mendoza, Amparo San-Pedro, Esther Culebras, Raquel Cíes, Carlos Taxonera, Raquel Lana, Elena Urcelay, Fernando de la Torre, Juan J Picazo, Manuel Díaz-Rubio

30/30 (100%) CD pacientov MAP-pozitívnych
Všetci majú spheroplasty v kultúrach – viď foto

September 2010

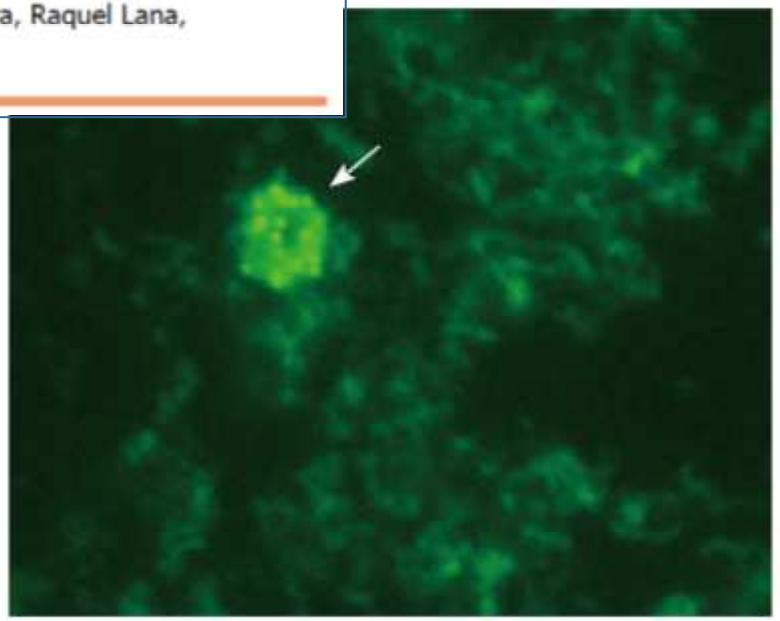


Figure 1 Microscopic examination of *Mycobacterium avium* subspecies *paratuberculosis* cultures isolated from blood of patients with Crohn's disease. Phenolic-acridine orange techniques to detect cell-wall-deficient *Mycobacterium avium* subspecies *paratuberculosis* [spheroplasts (arrow)].

February 2011

ORIGINAL ARTICLE: GASTROENTEROLOGY

Association of *Mycobacterium avium* subspecies *paratuberculosis* With Crohn Disease in Pediatric Patients

*Adrienne Lee, *Tanya A. Griffiths, *Rohan S. Parab, §Robin K. King, ||Marla C. Dubinsky, †Stefan J. Urbanski, ‡Iwona Wrobel, and *Kevin P. Rioux

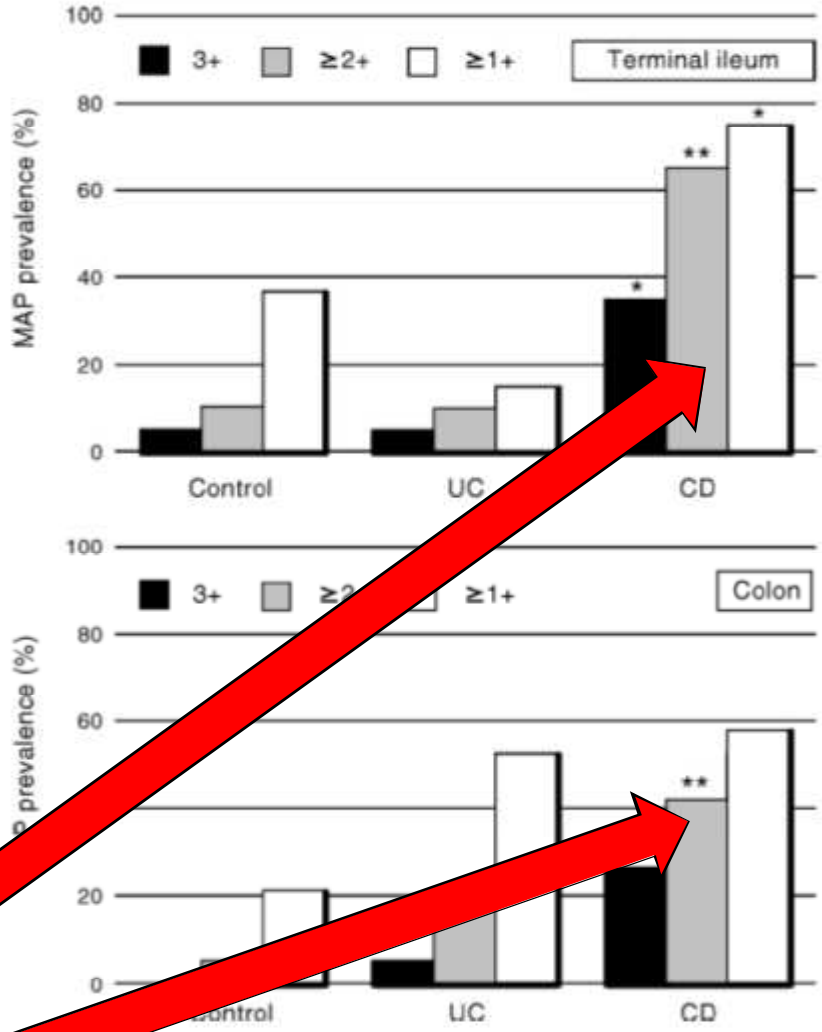
Terminal ileum			
CD	7/20	35%	$P < 0.05$
UC	1/20	5%	$P = NS$
Control	1/19	5.2%	

$P < 0.05$

Colon			
CD	5/9	26.3%	$P = NS$
UC	1/19	5.2%	$P = NS$
Control	0/19	0%	

$P < 0.05$

FIGURE 1. Summary of MAP prevalence in pediat granulomatous CD. MAP *IS900* was detected in abo -third of ileal and one-fourth of colonic biopsies in nts w , which was significantly greater than M e in control subjects. Prevalence of MAP in UC not significantly different from controls. This analysis used the most stringent criteria to define MAP positivity (triplicate PCR reactions were positive for *IS900*, which was confirmed by sequencing). Specimens in which PCR failed to amplify the *APC* gene were excluded. CD = Crohn disease; MAP = *Mycobacterium avium* subsp *paratuberculosis*; PCR = polymerase chain reaction; UC = ulcerative colitis.



URE 2. MAP *IS900* prevalence stratified by stringency of PCR replicates. Nested *IS900* PCR reactions were carried out in triplicate. The primary analysis defined MAP prevalence based on all three replicates showing the presence of *IS900*. If less stringent criteria were applied, MAP detection could be defined on the basis of ≥2/3 or ≥1/3 PCR positive for *IS900*. Regardless of the level of stringency, the association between pediatric CD and MAP *IS900* detection in ileum (top panel) or colon (bottom panel) remained intact. $^{*}P < 0.05$, $^{**}P < 0.01$ *vs* respective control samples. CD = Crohn disease; MAP = *Mycobacterium avium* subsp *paratuberculosis*; PCR = polymerase chain reaction.

Paratuberculosis je potenciálny problém potravinovej bezpečnosti

Journal of
Applied Microbiology

Journal of Applied Microbiology ISSN 1364-5072

2009

REVIEW ARTICLE

Contamination of food products with *Mycobacterium avium paratuberculosis*: a systematic review

M.M. Eltholth, V.R. Marsh, S. Van Winden and F.J. Guitian

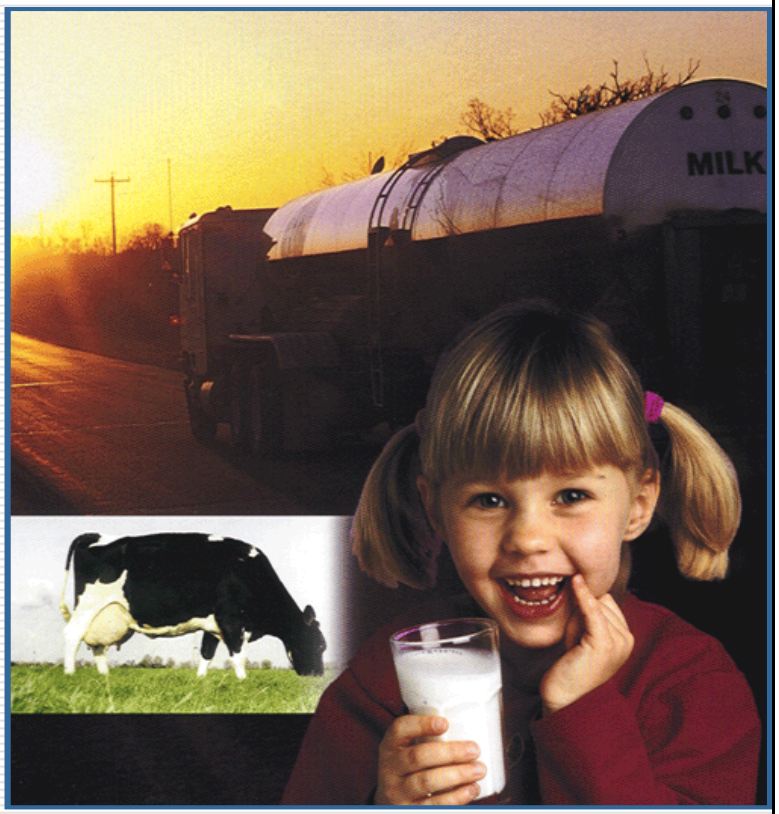
Department of Veterinary Clinical Sciences, Royal Veterinary College, London, UK

Súčasné dostupné dáta naznačujú že pravdepodobnosť kontaminácie mliečnych a mäsových produktov MAP **by nemala byť prehliadaná**.

Pasterizácia nie je na 100% efektívna

- *MAP*: najviac tepelne-odolné *Mycobacterium* sp. (lab studies):
  - U.S., U.K., Germany

- *MAP*: kultivované z predajného HTST pasterizovaného mlieka
  - 1.8% in U.K. (AEM May 2002)
  - 1.6% in Czech Rep. (AEM March 2005)
  - 2.8% in U.S. (J. Food. Protect. May 2005)
  - 67% in India (Int. J. Infect. Dis. Feb. 2010)
  - 2.7% in Brazil (11-ICP, Carvalho et al., 2012)



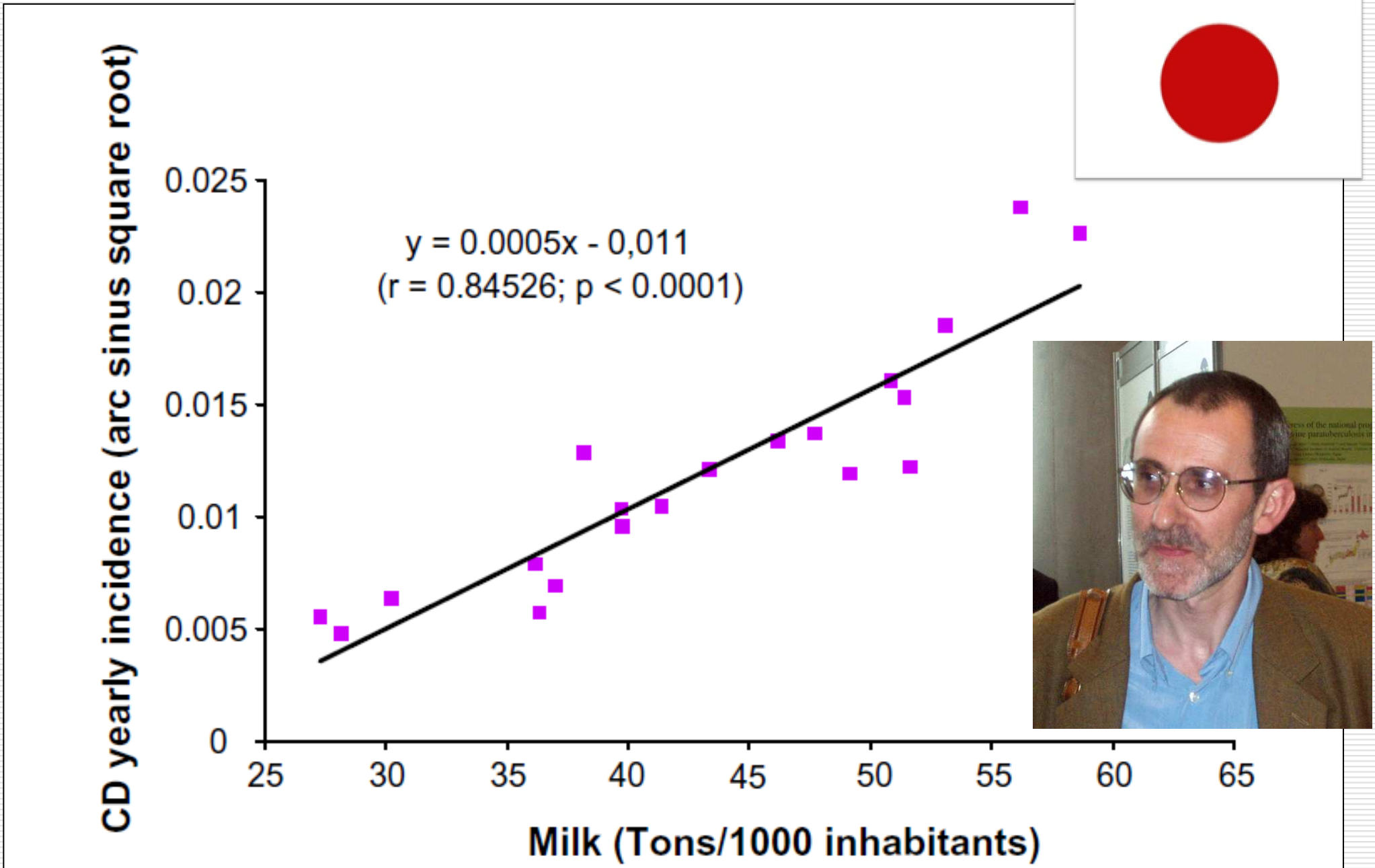


Fig. 4. Association between milk consumption and Crohn's disease incidence in Japan during the period 1966–1985.

MAP v práškových mliečnych produktoch pre dojčatá

Krajina	Veľkosť štúdie	% PCR positive	% Culture positive	Reference

Botsaris et al. 11-ICP

35 vzoriek; 11 producentov

9.4% MAP culture-positive

21.9% PCR-positive

Epidemiologické štúdie: kojenie znižuje riziko Crohnovej choroby.

OPEN ACCESS Freely available online

PLoS one

Identification and Characterization of a Spore-Like Morphotype in Chronically Starved *Mycobacterium avium* Subsp. *Paratuberculosis* Cultures

Elise A. Lamont[1], John P. Bannantine[4], Aníbal Armién[1], Don Sanjiv Ariyakumar[3], Srinand Sreevatsan[1,2]

1 Veterinary Population Medicine, University of Minnesota, St. Paul, Minnesota, United States of America, 2 Department of Veterinary Biomedical Sciences, University of

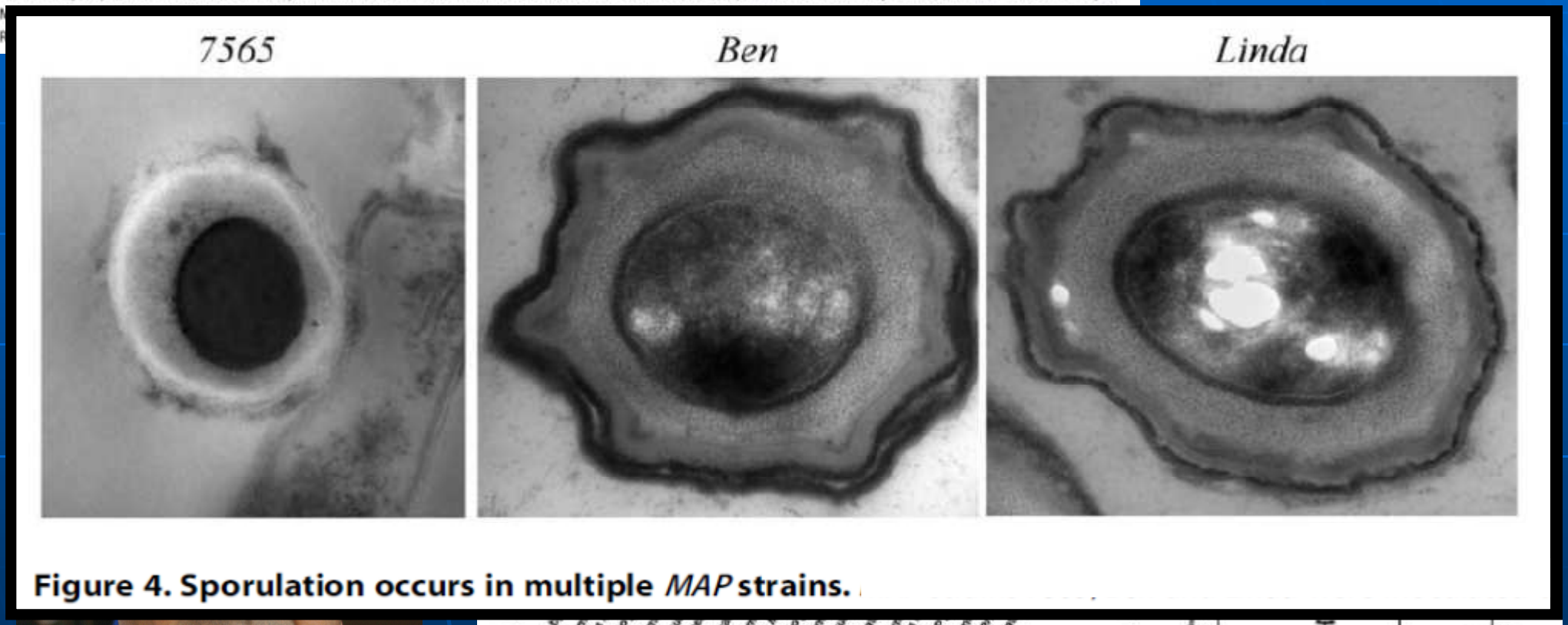
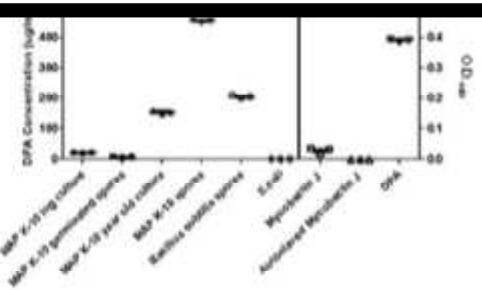


Figure 4. Sporulation occurs in multiple *MAP* strains.



doi: 10.1111/j.1471-0307.2010.00596.x

ORIGINAL RESEARCH

Microbiological characterisation of artisanal farmhouse cheeses manufactured in Scotland

ALAN G WILLIAMS* and SUSAN E WITHERS

Department of Biological and Biomedical Sciences, Glasgow Caledonian University, Glasgow G4 0BA, Scotland

August, 2010

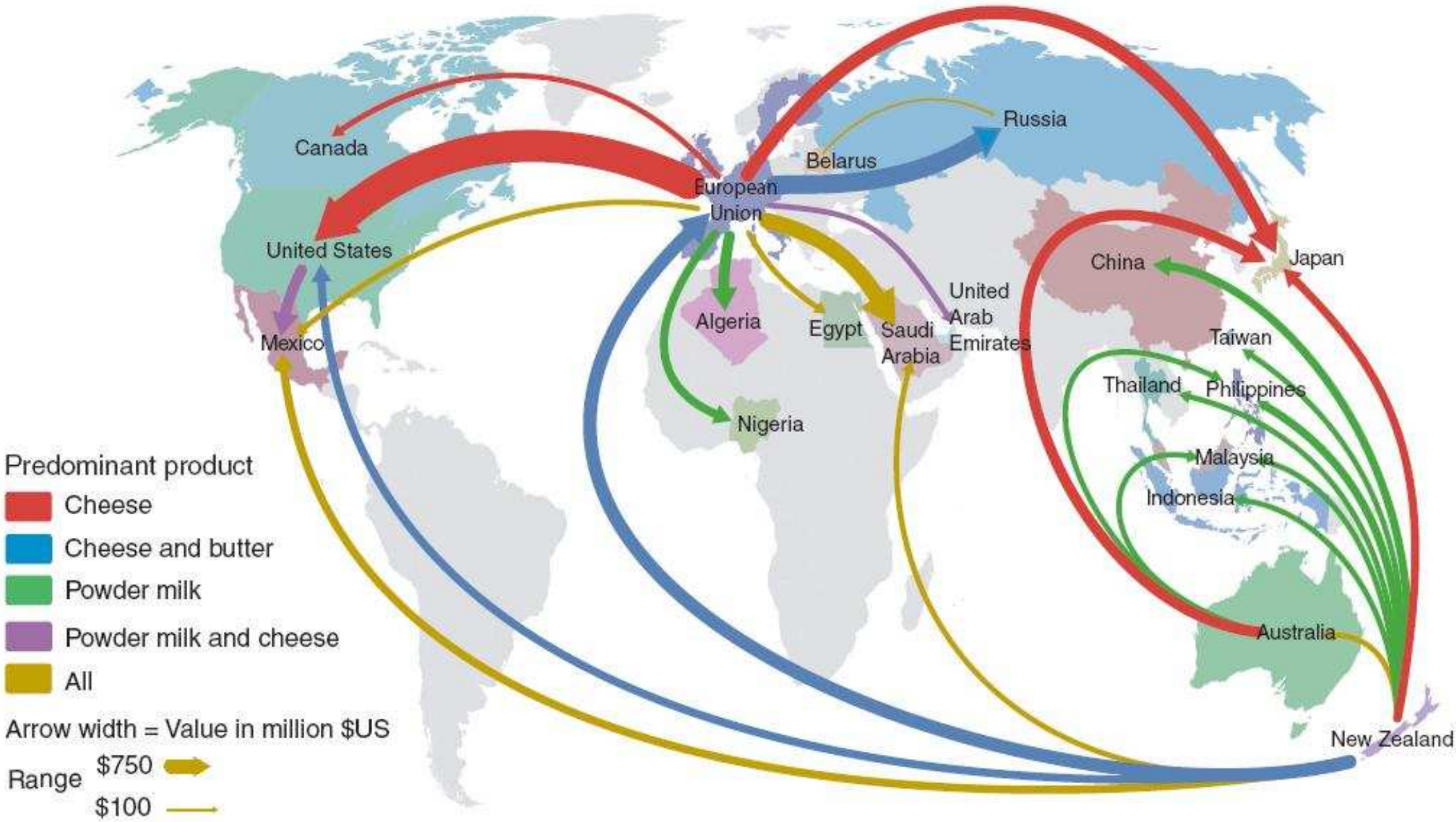
Twenty-eight Scottish artisanal farmhouse cheeses were examined in respect of 16 microbial groups of significance for food safety and cheese character development. Microbial populations were diverse and although Escherichia coli O157 and Salmonella spp. were not detected the occurrence of potential food-borne pathogens was confirmed in 86% of the samples analysed. Mycobacterium avium subsp. paratuberculosis was detected in 25% of the cheeses tested and some Staphylococcus aureus and the Bacillus cereus isolates were enterotoxigenic. Resistance to methicillin and vancomycin and other clinically important antibiotics was detected in some S. aureus and Enterococcus strains. The inappropriate labelling of some raw milk cheeses and the consequences of the complexity of the microbial population on isolation media specificity is discussed.

MAP detekované kultiváciou u 25% testovaných syrov

rium avium subsp.

Mliečne produkty sú mobilné

Major Global Trade Flows of Dairy Products in 2003



Kravy s Paratuberkulózou sú zabíjané & konzumované

- Prejdú ante-mortem veterinárnou inšpekciou
- Prejdú post-mortem veterinárnou inšpekciou
- Často majú diseminované MAP infekcie

Test-and-cull JD kontrolné programy sú v základe test-and-feed-to-the-public.

PAPERS & ARTICLES

Relationships between clinical signs, pathological changes and tissue distribution of *Mycobacterium avium* subspecies *paratuberculosis* in 21 cows from herds affected by Johne's disease

C. BRADY, D. O'GRADY, F. O'MEARA, J. EGAN, H. BASSETT

Veterinary Record February 2, 2008

TABLE 3: Distribution of *Mycobacterium avium* subspecies *paratuberculosis* (MAP) in the 11 pooled samples of tissues from 21 cows from eight herds affected by Johne's disease

Animal*	Head LNs	Thoracic organs	Terminal ileum	Mesenteric LN	Ileocaecal LN	Caecal contents	Small intestine	Large intestine	Abdominal organs	Prescapular and popliteal LN	Supramammary LN and mammary gland
A1	+	+	+	+	+	+	+	+	+	+	+
A2	CT	+	+	+	+	+	+	+	CT	+	CT
A3	+	+	+	+	+	+	+	+	+	+	+
A4	+	–	+	+	–	+	+	+	–	+	–
A5	+	+	NR	+	NR	+	NR	NR	+	–	NR
A6	–	+	+	+	+	+	–	+	–	+	+
A7	+	+	+	+	+	+	+	+	+	–	–
B1	–	+	+	+	+	+	+	+	–	–	–
B2	–	+	+	+	NR	–	–	–	–	–	–
B3	CT	+	+	NR	+	+	+	+	+	+	NR
B4	+	+	+	+	+	CT	+	+	+	+	+
B5	+	+	+	+	+	+	+	+	+	+	+
B6	CT	–	+	–	+	+	+	–	–	–	–
C1	+	+	+	+	+	NR	+	+	+	+	+
C2	+	–	+	–	+	+	NR	–	NR	NR	NR
C3	–	–							–	+	NR
C4	–	–							–	–	–
D1	+	+	+	+	+	NR	–	+	CT	+	+
D2	–	+	+	+	NR	NR	+	–	–	+	+
D3	–	–	+	–	+	CT	+	–	–	NR	–
D4	+	–	+	+	+	+	+	–	–	+	–

ELISA-positive; klinicky normálne

* Group A Persistent diarrhoea, Group B Intermittent diarrhoea, Group C No diarrhoea but illthriven, Group D Clinically normal
LN Lymph node, + MAP cultured, CT Contaminated, – MAP not cultured, NR No result

Nie všetky Johne's kravy sú chudé

IDEXX ELISA S/P = 2.0 = Strong-positive

CSU study: 12 of 21 (57%) zabitých dojníc potvrdených s MAP-infekciou nemalo nijaké klinické príznaky Johne's disease.

Antognoli et al. Veterinary Microbiology 127:300, 2008

FOODBORNE PATHOGENS AND DISEASE
Volume 6, Number 4, 2009

DOI: 10.1089/fpd.2008.0226

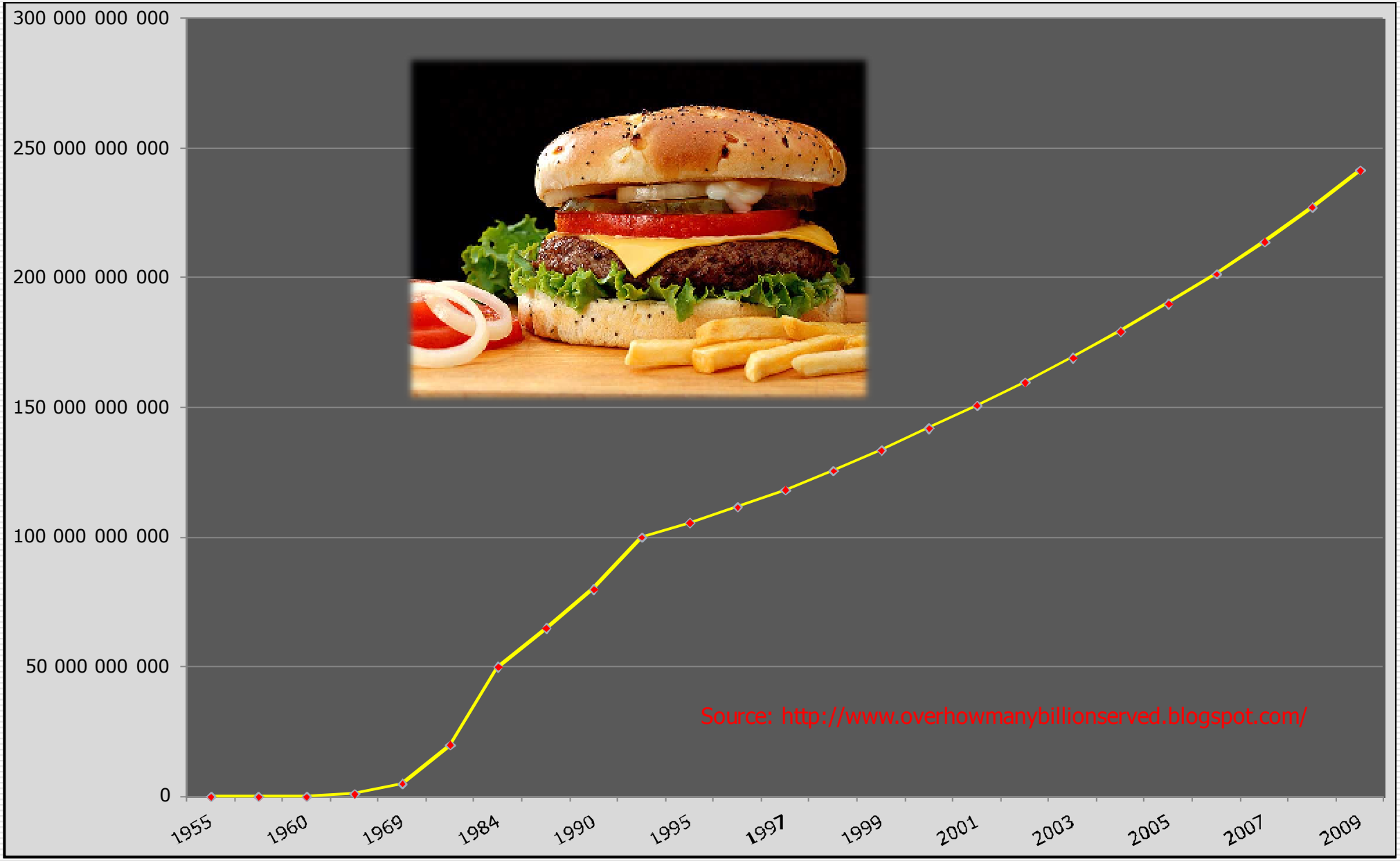
Isolation of *Mycobacterium avium* subsp. *paratuberculosis* from Muscle Tissue of Naturally Infected Cattle

Marta Alonso-Hearn, Elena Molina, Marivi Geijo, Patricia Vazquez, Iker Sevilla, Joseba M. Garrido, and Ramon A. Juste

Type	Breed	# Animals	% clinical signs of pTB	% culture-pos muscle
Dairy	Jersey	11	45%	9%
Dairy	Friesian	31	22%	10%
Beef	Limousin	5	0	40%
Total		47	26%	13%

Billions and Billions of Burgers!

Logos of retail hamburger chains removed for liability concerns



Epidemiológia je komplexná

ale

zrozumiteľná

„nosiče“

zdroj

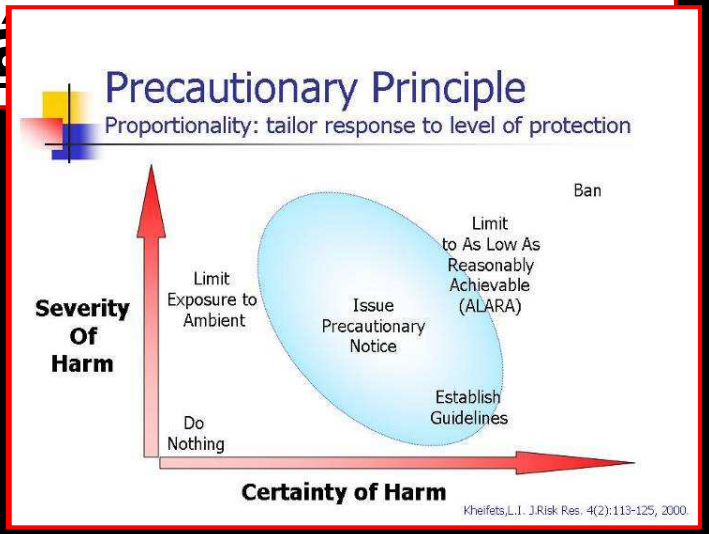
vnímavý hostiteľ

TAFS

INTERNATIONAL FORUM FOR

TRANSMISSIBLE ANIMAL DISEASES & FOOD SAFETY

TAFS odporúča MAP kontrolu na farme, národnej a nadnárodnej úrovni, aby sa takým spôsobom limitovala MAP kontaminácia potravín na preventívnom princípe aby surové mlieko a mäso pochádzalo z **test-negatívnych sta**



http://www.tseandfoodsafety.org/

Jednoduchý koncept:

Zdravé potraviny pochádzajú zo zdravých zvierat.

Jednoduchý fakt:

Zvieratá s paratuberkulózou nie sú zdravé.

Producenti a ich veterinárni lekári majú vedomosti a nástroje ako produkovať surové produkty s nízkym rizikom *MAP* kontaminácie.

5 dôvodov prečo kontrolovať pTB

1. pTB znižuje mliečnu produkciu.

2. pTB je infekčné ochorenie (šíriace sa).

3. pTB testy sú presné a cenovo dostupné.

4. pTB kontrola zlepšuje celkové zdravie stáda.

5. vedecky založený program postavený na mliečnom ELISA je ľahký, dostupný, a tým pravým, čo je treba robiť pre konzumentov.

- Použi HACCP Princípy –

Umiestniť početné prekážky medzi *MAP* zdroj
a
telatá či konzumentov

- ☑ Predchádzať infikovaniu stád
- ☑ Zabrániť šíreniu infekcie na farmách
- ☑ Testovať stáda a vyraďovať pozitívne jedince
- ☑ držať mäso a mlieko hygienicky
- ☑ Pasterizovať všetky mliečne produkty

Potravinová bezpečnosť:
"teat to tongue" or "moo to you"

Jeden Svet – Jeden Štandard Bezpečnosti Potravín

Praktická skúsenosť naznačuje, že paratuberculosis **môže byť kontrolovaná** ale nie iba zmenami manažmentu samotnými.

TESTOVANIE JE ZÁKLADOM


Otázky?