Contamination of dairy products with *Mycobacterium avium paratuberculosis:* A systematic review

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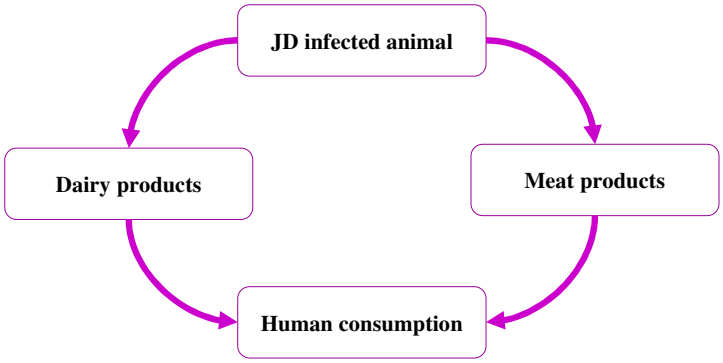
Introduction

- Johne's disease (JD) is a chronic disease of ruminants caused by *Mycobacterium avium paratuberculosis* (MAP). Clinically and subclinically infected animals shed MAP in their milk and faeces.
- MAP has been isolated from raw milk, pasteurized milk and cheeses on retail sale in different countries.
- Crohn's disease (CD) is a chronic inflammatory disease of the human intestine.
- The relationship between MAP and CD is not fully understood but dairy and meat products are considered as potential sources of human exposure to MAP.



Potential human exposure to MAP via consumption of food products

Aims

The aim of this review is to systematically collect, appraise and summarize scientific studies concerning the likelihood of contamination of dairy products with MAP and the likely changes in the quantity of MAP in these products from farm to retail sale.

Materials & Methods

Following the guidelines for conducting systematic reviews, we developed a protocol to answer the review questions (Eltholth et al 2009).

Titles and abstracts were screened to identify relevant papers. For any paper to be included in this review it had to pass the following stages:

Primary identification of relevant studies

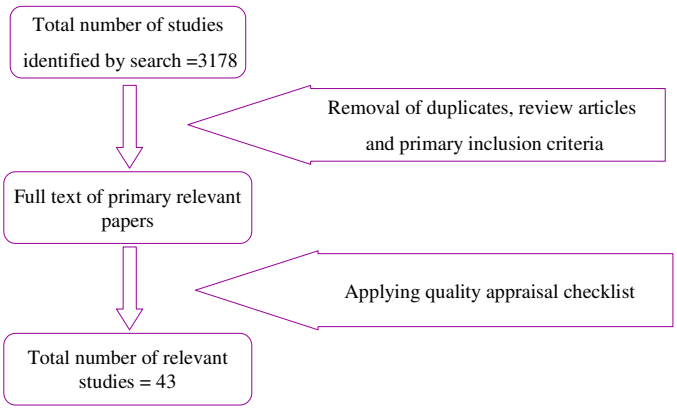
- Published in a peer-reviewed scientific journal,
- In English language
- Address at least one of the research questions

Quality appraisal

For assessing the quality of primary studies with a broad scope and range of study designs (a checklist was developed and applied to the full text of primary relevant studies).

The assessment was carried out by 2 independent reviewers and for quality assurance, a random sample from relevant and irrelevant studies was selected and reviewed independently by a third reviewer.

Results



- JD prevalence studies indicate that herd prevalence ranged from 2.6% to 70.2% in dairy cattle.
- Pasteurization and cheese processing do not completely inactivate MAP.
- There are no primary studies that investigated the presence of MAP in dairy products other than milk and cheeses.

Conclusions

- To characterize the potential contamination of dairy products with MAP, the following studies are needed:
  - ❖ Quantitative studies to estimate the amount of shedding of MAP from infected animals in milk and faeces,
  - ❖ Quantitative studies for faecal contamination of milk.
  - ❖ Quantitative studies to estimate the effect of different processing steps on MAP viability.
- In order to mitigate the risk of human exposure to MAP via dairy products, the effect of other alternative processing steps on MAP removal/inactivation should be investigated.
- At the current state of knowledge, the likelihood, magnitude and potential consequences of the presence of MAP in dairy products on retail sale must not be ignored.

References: Eltholth, M.M., Marsh, V.R., Van Winden, S. and Guitian, F.J. (2009) Contamination of food products with *Mycobacterium avium paratuberculosis*: a systematic review. Journal of Applied Microbiology. (In press)

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ParaTBTools