A Method for the Laboratory-Scale Manufacture of UK Semi-Hard and Hard Type Cheeses from Milk Contaminated with the *Mycobacterium bovis*.

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Introduction
Although the UK has established control and monitoring mechanisms for tuberculosis in cattle the prevalence of tuberculosis amongst dairy herds continues to increase. Concomitantly there is a growing market for artisanal cheeses produced from raw milk. The absence of a pasteurisation process removes a major barrier to possible *Mycobacterium bovis* contamination of raw milk cheeses. A link between *M. bovis* zoonotic infections and the consumption of raw milk and related products has been established.

Rationale & Objectives
Currently a lack of data exists regarding the survival kinetics of *M. bovis* during the manufacture, ripening and storage of raw milk cheeses. To address this knowledge gap it was essential to devise a protocol for the production of semi-hard (Caerphilly) and hard cheese (Cheddar). The cheesemaking procedure must satisfy stringent health and safety criteria regarding manipulation of Hazard Group 3 organisms and produce on a laboratory-scale cheese comparable with commercial products.

Results & Findings
The devised procedure mimics the cutting and stacking of curd, traditionally used to develop the characteristic texture of cheddar cheese. Equipment developed facilitates the application of constant, measurable and reproducible pressure during pressing. All cheesemaking manipulations can be conducted within the confines of a Class I safety cabinet. Containment measures allow for the safe collection of whey and subsequent disposal. Cheddar and Caerphilly cheeses prepared from raw milk artificially contaminated with *M. bovis* have been produced and *M. bovis* has been enumerated on selective media post manufacture.

Conclusions
This procedure allows the investigation of *M. bovis* survival kinetics in raw milk cheeses. Furthermore the technique could be used with other Hazard Group 2 & 3 pathogens and adaptation is possible for production of alternative cheese types. As a result this protocol is a tool for the production of microbiologically contaminated cheese which can facilitate investigation of food protection relating to cheese.

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