ABSTRACT

WIDAGDO SRI NUGROHO. Detection of *Mycobacterium avium* subspecies *paratuberculosis* in Dairy Cows, Pasteurized Milk, and Growing-up Formula Milk in Bogor. Under the direction of MIRNAWATI SUDARWANTO, DENNY WIDAYA LUKMAN, EWALD USLEBER, and SURACHMI SETIYANINGSIH

Indonesia has been importing dairy cows and milk products from countries which have endemic disease of paratuberculosis or Johne’s disease. This disease is caused by Mycobacterium avium subspecies paratuberculosis (MAP) and has big impact in economic losses of dairy industry. The bacterium has been suggested to cause Crohn’s disease that can be transmitted via milk and milk products. In the last few years, paratuberculosis has been detected serologically in Indonesia. This situation suggests a potential spread of the disease in the national dairy herds, and may pose a public health risk. In the other aspect, Indonesia needs the diagnostic tools to isolate MAP cheaply but quite accurate. The Ogawa medium is a cheap medium, which is commonly used to isolate *Mycobacterium tuberculosis* in Indonesia and could be improved as growth medium for MAP.

The objectives of the current study were (1) to evaluate capability of modified Ogawa medium (MOM) as a growth medium for MAP, (2) to detect MAP in dairy herd and as good as to evaluate the association between farm management factors and the presence of the bacteria, (3) to detect MAP in pasteurized and growing up formula milk in Bogor.

The study was done in Bogor region. Milk and feces samples were taken from 62 dairy cows (with estimated prevalence of 5%) in Cibungbulang. Forty two pasteurized milk samples produced by 7 distributors and 50 growing up formula milk produced by 5 distributors were purchased in supermarkets.

Detection methods used MOM, herrold’s egg yolk medium with and without mycobactin J, mycobacterium growth indicator tube, Ziehl-Neelsen staining, and conventional polymerase chain reaction (PCR) using primers IS900 and F57. Performance of MOM as growth medium for MAP and *Mycobacterium avium* subspecies *avium* (MAV) was evaluated by agreement test (Kappa). The association between herd management factors and the presence of *Mycobacterium sp*. was evaluated using Odds Ratio (OR). The presence of MAP in raw, pasteurized, and growing up formula milk were analyzed descriptively.

The modified Ogawa medium showed very poor performance as growth medium for MAP (Kappa=0) but was useful for MAV (Kappa=1). There were no MAP isolated from raw milk and feces of dairy cows. Fifteen *Mycobacterium sp*. could be isolated from 15 dairy cows, but none of them was identified as either MAP or M. tuberculosis. The study suggests that the prevalence of MAP among dairy cattle in Bogor was less than 5%. The existence of *Mycobacterium sp*. in faeces associated with body weight (OR 1.9), individual cases of diarrhoea (OR 1.8), age (OR 1.7), daily milk product (0.5), and personal hygiene (0.3). Similarly, there was no evidence of life MAP contamination in pasteurized and growing up formula milks, but nested PCR using F57 detected MAP DNA in 5 samples from 3 growing-up formula milk producers.

Further study needs to be done to improve the formulation of MOM suitable for MAP. In addition, an observational study in dairy cattle, goat, sheep, and rabbit is necessary to achieve the comprehensive information on paratuberculosis in Indonesia. And from the public health point of view, a comprehensive and sustainable study on MAP in milk and milk products, as well as in human is of particularly important.

Key words: *Mycobacterium avium* subspecies *paratuberculosis* modified Ogawa medium, raw milk, pasteurized milk, growing-up formula milk.