

**RISK ASSESSMENT OF FOODBORNE DISEASES FROM *Bacillus cereus*
USING DOSE-RESPONSE MODELS**

ABSTRACT

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One of microbiological agents that caused foodborne diseases is *Bacillus cereus*. It caused two syndrome which are diarrhea and emetic. Many kinds of food can be contaminated by this bacteria, such as rice, pasta, dairy products, vegetables, and meat. Food poisoning cases had been reported in several countries. It is necessary to assess the risk of foodborne disease caused by this bacteria by dose-response assessment. The aims of this researches were to calculate dose-response model parameters for *B.cereus* in foods and to assess the risk in pasteurized milk and rice contaminated by *B.cereus*. Beta-Poisson and exponential dose-response model were used in the assessment of diarrhea syndrome, while Weibull dose-response model were used in the assessment of emetic syndrome. Model fitting was done via Maximum Likelihood Estimation implemented in R software. Bacterial concentration was calculated via Modified Gompertz Estimation. The results show that beta-Poisson model gave the best fitting parameters ($\log \alpha = -4.3$ and $\log N_{50} = 59.3$), while Weibull model gave the best fitting parameters ($\log \alpha = 0.98$ and $\log \beta = 2.77$). In application shows that it was better to keep food, pasteurized milk at 5-13°C less than 10 days, and rice at 20-30°C less than 1 hours.

Keywords: *B.cereus*, diarrhea, emetic, beta-Poisson, exponential, Weibull dose-response model.