

Quantitative Microbial Risk Assessment For Campylobacter Jejuni And C. Coli Associated With The Consumption Of Camel Milk Qatar

[10.5339/qfarc.2014.HBPP0242](https://doi.org/10.5339/qfarc.2014.HBPP0242)

Hussni Omar Mohammed, Bvsc, Mvsc., Mpm, Phd; Kenlyn Peters; Ahmed Salem; Sanjay Doiphode; Ali Sultan

CORRESPONDING AUTHOR :

hom1@cornell.edu

College Of Veterinary Medicine, Cornell University, Ithaca, United States

Abstract

Background and Introduction—According to the Food and Agricultural Organization that more than one-third of the population of the world is affected each year by food-borne diseases caused by chemical and biological hazards. Foodsafety has been identified as high priority in the Qatar National Food Security Master Plan. *Campylobacter* spp. are among the leading causes of foodborne illness and capable of triggering severe gastroenteritis with grave long-term sequelae and serious economic impact such as, Inflammatory Bowel Disease (IBD). The practice of drinking fresh camel milk, although is a tradition in Qatar, is increasing around the world because of the perceived medicinal value for health in general, diabetes, autism, and allergies. In addition to the fact that camel milk is the closest to human mother's milk, it contains high levels of antioxidants and iron. Being a fresh product it is exposed o foodborne pathogens including *Campylobacter* spp. Understanding the pathway by which this hazard enter the food chain and pose risk to human will help in developing risk mitigation strategies. We carried out a study to assess the potential risk of illness from the consumption of camel milk contaminated with *Campylobacter* spp. in Qatar and identify critical intervention points that would contribute to mitigating its associated risk.

Methods—We used the quantitative risk assessment (QRA) methodology using a combination of deterministic and stochastic approaches to address the stated objectives. The QRA approach helps in identifying stages in the production system from farm-to-table that are likely to play role in mitigating or exacerbating the risk of illness associated with the consumption of contaminated camel milk with this pathogen. Data on the probability of either *C. jejuni* or *C. coli* in camel milk or in humans were obtained through repeat cross-sectional studies in these populations. Estimates of the adverse health effects were obtained using risk characterization which integrated data on hazard characterization and exposure assessment, including dose-response model. A Monte Carlo Simulation of inputs in the model was performed using @Risk software (Palisade Software, Newfield, NY, USA) and parameters were obtained using Latin Hypercube sampling. Sensitivity analyses were performed to capture the effect of uncertainty and variability of the different parameters used in the model on the predicted risk of illness.

Results—Our preliminary analyses showed that the probability of illness for a healthy female from the consumption of camel milk contaminated with *C. jejuni* ranged from 5×10^{-3} to 24×10^{-2} depending on the amount of camel milk consumed. However, the risk for male is higher (13×10^{-3} to 30×10^{-2}). The estimates of illness are three times higher for immune compromised females consumed fresh camel milk. We also evaluated the risk of illness for immune compromised males that consumed fresh camel milk and it was five-times higher in comparison to healthy men. The risk of illness due to the consumption of camel milk contaminated with either *C. jejuni* or *C. coli* could be significantly reduced for either gender by increasing the efficacy of sterilizing the milk by boiling or pasteurization.