Abstract

Background: *Salmonella* is one of the foodborne pathogens affecting public health around the globe. A cross sectional bacteriological study was conducted from December 2019 to November 2020. This study aimed to isolate, molecularly detect and determine antibiotic susceptibility patterns of *Salmonella* from raw cows' milk collected from dairy farms and households in Hawassa, Arsi Negele, and Dale districts.

Materials and methods: A total of 384 raw milk samples were collected using a simple random sampling technique. Standard bacteriological and biochemical tests were used to isolate *Salmonella*. The positive samples were further confirmed by the molecular test. Kirby-Bauer disk diffusion method was used for antimicrobial susceptibility testing of *Salmonella*. **Results:** Using bacteriological and biochemical detection tests, *Salmonella* was isolated from 10.42% (*N*=40) of the total sample. However, in molecular detection, only 32 of the 40 isolates were confirmed to be *Salmonella* using PCR test. The prevalence was 8.54, 12.69, and 10.46% in Hawassa, Dale, and Arsi Negele districts, respectively. Bacteriological prevalence did not vary significantly between the districts ($P > 0.05$). Likewise, no significant ($P > 0.05$) variation was observed in the *Salmonella* isolation rate between households (12.5%) and farms (8.33%) as well as between dry (8.85%) and wet (11.98%) seasons. Based on herd size, the isolation rate of *Salmonella* was significantly higher ($P < 0.05$) in large-scale farms (19.51%) than in small (5.1%) or medium (5.6%) scale dairy farms. The result of the antibiotic susceptibility test showed that *Salmonella* isolates were 100% resistant to ampicillin, while they were 100% sensitive to ciprofloxacin. Multi-drug resistance (MDR) was demonstrated in all isolates. Conclusion: This study showed that *Salmonella* is widespread in the raw milk samples and developing MDR, which may be of public health concern in the study area. It is therefore important that dairy farmers and raw milk sellers in the study area take serious measures to avoid contamination of the milk with *Salmonella* spp. In addition, the active commitment of the animal health departments in the respective districts to sensitizing dairy farmers and the sensible use of antibiotics at the farm level can help to reduce the antibiotic resistance of *Salmonella* spp.

Keywords: Antimicrobial susceptibility, Culture, Ethiopia, *Inv*A gene and *Salmonella*