Dual-Antibody Sandwich Format Combined with Enzyme-Linked Immunomagnetic Chemiluminescence for the Detection of *Escherichia Coli* O157:H7

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Contamination of foods with the pathogenic bacteria *Escherichia coli* O157:H7 has been implicated in numerous cases of food borne illnesses. Many rapid methods have been developed for the detection of this pathogen in foods in order to circumvent timely plate culture techniques. However, many of these methods are solely used for screening and are therefore considered presumptive since they do not claim to confirm the presence of *E. coli* O157:H7. Using a relatively affordable and portable chemiluminescent detection method coupled with an enzyme-linked sandwich immunoassay and paramagnetic microparticles (enzyme-linked immunomagnetic chemiluminescence; ELIMCL), we have developed a rapid method that shows promise for confirming the presence of *E. coli* O157:H7. The key feature of this assay is that it combines the highly selective synergism of both anti-O157 and anti-H7 antibodies in a dual-antibody sandwich immunoassay format. This work presents the application of a one-step ELIMCL to the detection of live *E. coli* O157:H7 with apparent detection limits of approx. $1 \times 10^5$ to $1 \times 10^6$ of cells per milliliter. In addition, the sandwich-based immunoassay portion of this method is performed in a one-step format that only requires a total assay time of approx. 1 hr.