

## Development of a novel simulated wound exudate using gelatine

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Simulated wound fluids (SWFs), which accurately replicate the wound exudate in terms of biochemical and physical characteristics are integral for clinically relevant *in vitro* evaluation of therapeutics such as wound dressings. However, conventional formulations which rely on bovine serum albumin (BSA) are expensive. The objective of this study was to develop a low-cost formulation for SWF containing an alternative protein source. Each of the SWF variants was formulated with equivalent salt-buffer composition and 34 g/L of protein. Egg white-based and gelatine-based SWFs were prepared and compared with a BSA-based SWF. All SWF samples were filter sterilized. Each SWF was inoculated with a suspension of *Staphylococcus aureus* and incubated for 24 hours at 37 °C. The viability of bacteria was confirmed by MTT assay, and the growth was quantified by optical density (OD<sub>600</sub>). All assays were conducted in triplicate. Highest bacterial growth (OD<sub>600</sub> = 0.490 ± 0.0078) was supported by the gelatine-based SWF, compared to BSA-SWF (0.314 ± 0.0179) and egg white-SWF (0.284 ± 0.0106). The low growth in egg white SWF is attributed to its intrinsic antimicrobial proteins: lysozyme, ovo-transferrin, and avidin. These results demonstrate that gelatine is a potential cost effective and readily available alternative to BSA for development of SWF. It delivers reproducible bacterial growth which is comparable to that observed with BSA. The availability of a cost-effective SWF would increase accessibility and improve the scalability of wound infection models assisting in high throughput screening of wound dressings and antimicrobials under conditions which closely mimic the wound milieu.

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