

Inactivation of enterohemorrhagic *Escherichia coli* (EHEC) by non-thermal atmospheric pressure plasmas

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Foodborne illnesses occur worldwide and in any environment. They are caused by the consumption of raw and microbial contaminated food, mostly by Gram-negative bacteria like *Escherichia coli* and its pathovar EHEC (enterohemorrhagic *Escherichia coli*) as well as *Listeria monocytogenes* and *Salmonella* spp.. The last EHEC epidemic 2011 in Europe, especially in Germany, was caused by EHEC strain O104:H4. To reduce and/or prevent microbial contaminations, cleaning and hygiene of food is indispensable. Due to many disadvantages of the current used methods, the industry is in need of alternatives. One possible alternative could be physical plasma. It is used worldwide in manifold applications and is a flexible and highly adaptable tool, maybe for decontamination of food. Therefore, two very different non-thermal atmospheric pressure plasma techniques, a DBD setup and a microwave driven discharge, were investigated for their antimicrobial capacity against *E. coli* strain K-12, O157:H- as well as O104:H4. The used plasma sources led to the inactivation of the bacteria *E. coli* (K-12), EHEC (O157:H-) and EHEC (O104:H4) for a level of ≥ 3 to 5 log steps within 9 minutes treatment time (Figure 1). The gained results are very promising, however, further investigations with other foodborne pathogens should follow and the influence to the food quality must be considered. [1]

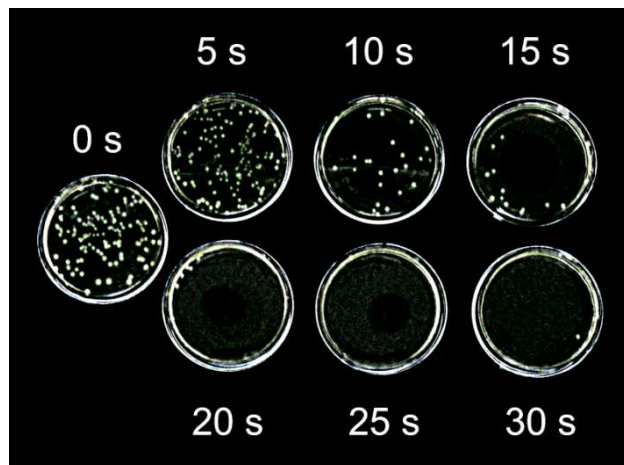


Figure 1: Inactivation of *E. coli* K-12 by surface DBD

References

[1] Oehmigen K., Schnabel U., Kühn K., Weltmann K.-D., Steinmetz I., Ehlbeck J., von Woedtke Th., Plasma Process. Polym. 2012, (paper submitted)