This study is focused on the evaluation of possibility to use high power pulsed light (HPPL) for microbial control of strawberries. Berries were treated with HPPL and afterwards analysed in terms of microbial contamination, shelf-life expansion, firmness, total phenolics, total anthocyanins, ascorbic acid content, antioxidant capacity and CIELab color coordinates. Results indicated that the decontamination of strawberries by HPPL was significant compared to control. Naturally distributed mesophilic bacteria on the surface of berry were inactivated by 1.1 log, inoculated Bacillus cereus was more susceptible to pulsed light treatment and its inactivation reached 1.5 log. Yeasts/microfungi distributed on the surface of strawberries were inhibited by 1 log. The shelf-life of treated strawberries was extended by 2 days. The increase of temperature on the surface of fruit never exceeded 42°C. No impact on the strawberry surface colour was detected. Data obtained in this study support the idea that high power pulsed light technique with its high selectivity, antimicrobial efficiency and non-thermal nature can serve in the future for the development of completely safe non-thermal and environmentally friendly preservation technology of fruits and vegetables.