

**DEVELOPMENT AND PERFORMANCE
EVALUATION OF POULTRY FEEDSTUFF
DISINFECTION MACHINE USING
ULTRAVIOLET**

By

AYA SHARAF MOHAMED AHMED

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Name of Candidate: Aya Sharaf Mohamed **Degree:** M.Sc.
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Supervisors: Dr. Ahmed El-Raie Emam Suliman
Dr. Mohamed Sayed Omran
Dr. Karim El-Sayed Saleh Hegazy
Department: Agricultural Engineering **Branch:** Agricultural Engineering
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ABSTRACT

The poultry industry is one of the largest and fastest growing sectors of livestock production in the world which increase meat and egg production. Crops are contaminated with mycotoxins during improper storage. So the feed must be free from fungal pathogens to enable breeders to obtain safe food and decrease the cost of production and maintain animal good health by taking safe food for its growth and reproduction. The aim of this study is to 1. development and construction of UV-C disinfection machine. 2. study the effect of UV-C radiation on mycotoxins in poultry feedstuff and evaluation UV-C disinfection machine performance. 3. evaluation of UV-C disinfection machine to determine the optimum operation parameters, consumed power, energy required and estimation of operation cost. The optimum disinfection efficiency, power and energy requirements it was concluded that 1. the disinfection efficiency percentage were always increased gradually as the disinfection machine rotational speed from 10 to 20 rpm, at any slope angle degree from 0 to 20 degree and feeding rate increased from 0.6 to 1.8 Mg/h. 2. the disinfection efficiency decreased by increasing feeding rate from 1.8 to 2.4 Mg/h may be ascribed to increase accumulation of feedstuff materials inside the disinfection machine, which in turn hindering the UV-C exposure intensity. 3. the maximum disinfection result for aflatoxin and ochratoxin decontamination were obtained 98%. 4. consumed power (Kw) and energy requirements (KW.h/Mg) was estimated considering the disinfection process produce the highest value of degradation percentage 98% of mycotoxins at different rotational speed from 10 to 25 rpm and increasing feeding rate from 0.6 to 2.4 Mg/h cause a corresponding in disinfection power consumption from 11.23 to 17.06, 12 to 18, 12.95 to 18.68 and 14 to 19.3 Kw respectively. 5. at the same level of feeding rate from 0.6 to 2.4 Mg/h the specific energy requirements (kW.h/Mg) increased from 18.7 to 23 kW.h/Mg as the rotational speed increased from 10 to 25 rpm. 6. evaluate the economical feasibility of disinfection machine was found the UV-C machine for disinfection poultry feed decreased with about 7 times comparing with traditional method by blending one packaged of decontamination material of antitoxic with the ratio of (0.5 kg/Mg). 7. The optimum operating parameters for the UV-C disinfection machine was 20 rpm rotational speed, 1.8 Mg/h feeding rate and 10 degree of slope angle, which produced maximum disinfection efficiency 98% with lowest cost 15 LE/Mg. That was associated with lowest consumed power 15.6 kW and specific energy requirements of 8.7 kW.h/Mg.

Keywords: UV-C radiation, ultraviolet processing, poultry feeding, mycotoxins, disinfection machine.

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