Chapter 3
UV–Based Indoor Disinfecting System

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ABSTRACT
When contagious diseases occur, there is a tangible threat of rampant spread of infection, incurring huge economic losses in animal deaths and decreased animal productivity. Thus, preventing pathogenic flora concentration in rooms where birds and animals are raised from exceeding permissible levels ranks first among veterinarian and sanitary concerns. When birds are kept on the floor during feeding, germ and dust concentration increases nine to ten times against normal. Ample research shows that ultraviolet (UV) radiation possessing a bactericidal effect is the most promising and environmentally friendly method of cleansing the air from harmful germs.

INTRODUCTION
Increased raising of poultry, pigs, and other animals at large-scale, industrialised establishments as well as at smaller farms has led to a range of challenges, prominently including the prevention and elimination of contagious diseases in animals, especially respiratory diseases affecting young specimens.

When contagious diseases occur, there is a tangible threat of rampant spread of infection, incurring huge economic losses in animal deaths and decreased animal productivity. The problem is made worse by the fact that such diseases are chiefly caused by the association of a range of proven and semi-proven pathogens, with specific means of prevention producing little effect and chemotherapy, even in the form of sprays, useless due to their high toxicity when sprayed on a permanent basis. Respiratory diseases spread predominantly through air.

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Thus, preventing pathogenic flora concentration in rooms where birds and animals are raised from exceeding permissible levels ranks first among veterinarian and sanitary concerns.

Large numbers of birds kept in enclosed spaces at large-scale, industrialised poultry farms lead to huge amounts of harmful substances being concentrated in the air in and out of the rooms.

Indoor air can become heavily contaminated with germs, including disease-causing ones, when infected birds are kept in the room in question or in the neighbouring room while due ventilation is not ensured.

Indoor germ concentration should never rise above sanitary norms, such as 100,000 bacteria per cubic metre for raising the young or 240,000 for keeping adult birds. Over 280,000 per cubic metre leads to sharply increased morbidity and mortality rates; at 910,000, morbidity reaches 25% and mortality is up to 10%.

When birds are kept on the floor during feeding, germ and dust concentration increases nine to ten times against normal.

As birds age, concentration of harmful substances and germs also increases. Thus, where week-old chicks were kept, between 45,000 and 65,000 germs were present in each cubic metre of air, but when the birds aged to between 120 and 150 days, the same value could reach one million (ref. Fig. 1).

Ample research shows that ultraviolet (UV) radiation possessing a bactericidal effect is the most promising and environment-friendly method of cleansing the air from harmful germs.
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