

Evaluation of Ventilation Effectiveness After Kitchen Renovation in Schools of Gyeongsangnam-do Province

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ABSTRACT

In February 2021, the death of a school kitchen worker due to lung cancer was recognized as an industrial accident for the first time in South Korea. Since then, several confirmed and suspected lung cancer cases have been reported in lung cancer medical checkup. To protect the health of school kitchen workers, the Office of Education at Gyeongsangnam-do Province selected Twenty-eight schools and implemented environmental improvement projects focused on the ventilation system in the kitchens. To evaluate the ventilation system in the kitchen, fan flow rate and hood face velocity were measured, and concentrations of CO, CO₂, and PM_{0.3} were measured during cooking operations. The smoke visualization technique was used to evaluate the capability of protecting worker's breathing zone. Mean Fan flow rate increased from 260m³/min before renovation to 794m³/min after renovation. Hood face velocity was tripled. The concentrations of PM_{0.3} showed a 95% reduction. Concentrations of CO showed more than a 75% reduction. Smoke visualization showed greater protection of worker's breathing zone. The renovations to the ventilation system have resulted in improved ventilation performance, increased capture of cooking pollutants, and a safer and more comfortable working environment in the kitchen.

Keyword: Hood/ Kitchen/ Ventilation/ School