Spine layout design for improving food hygiene and reducing travelled distances in a small-scale burger patties processing

ABSTRACT

This paper presents a method to perform a spine layout design for a burger patties processing in a rectangular premise measuring 31.5 x 9 x 3 m with a production volume of 300 000 kg/year. The factory experienced cross-contamination, pest infestation, inefficient material and operators flow and excessive moving distance during the production. The mentioned issues can be linked to the poor layout configuration and this consequently leads to incompliance to food safety standards and delay in production time. The poor layout plan is attributed to the lack of knowledge and guideline in designing an efficient and hygienic food plant layout. Hence, a spine layout is proposed in this paper as the company is preparing for the major renovation of the premise. A spine layout consists of a central aisle called "spine" with workstations or rooms located on either side. The central spine was used to conduct the production traffic, whereby food material, utilities and operators could access the different room from the central core. The new layout was able to effectively segregate the high-risk, low-risk processing, transitional and auxiliary's area for 24 rooms, consequently complying with the Good Manufacturing Practice and preventing cross-contamination risk. The travelled distance during the production operation was also reduced by 58.3% which would lead to the decrease in overall production time and increase in production efficiency.

Keyword: Cross-contamination; Food factory layout; Food processing; Hygienic layout; Production efficiency; Spine layout