Title (9)	:	**Valorization of Malaysian Fish Sausage (Keropok Lekor) By-Products into Bioactive Fish Protein Hydrolysate by Bacillus licheniformis Fermentation: Influence of By-Products Characteristics on Nutritional, Antioxidant, and Antibacterial Capacities**
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Abstract	:	The Malaysian fish sausage industry, Keropok Lekor (KL), generates large amounts of by-products (FBs), that are underutilised and inappropriately disposed of, resulting in negative environmental implications. This study aimed to transform the FBs into bioactive fish protein hydrolysate (FPH) via the Bacillus licheniformis fermentative approach. Besides the various FBs and strain type used, this study was significant for its detailed analysis exploring the effect of the FB's nutritional and amino acid (AA) contents on antioxidant and antibacterial activities, as well as the nutritional qualities of the FPHs. The B. licheniformis fermentation improved the FBs nutritional quality by increasing protein digestibility and essential AA content. The highest degree of hydrolysis (DH) was linked to soluble protein concentration, and there was a significant correlation ($R2 = 0.9$) between the DH and protein yields in the samples. The FPHs demonstrated stronger DPPH (32.5–58.4%) and ABTS (74.8–90.1%) antiradical activities and ferrous chelating activity (25.3–59.9%) than that of the FBs ($p < 0.05$), resulting from B. licheniformis metabolism that impacted on the generation of a higher content of hydrophobic and polar AAs. The fraction 3–10 kDa exhibited the highest peptide concentration and antioxidant activity due to the synergistic interactions between peptides with different molecular weights. However, all FPHs showed no significant ($p > 0.05$) difference in growth inhibition against all tested pathogens compared to their FBs.