Food

Antimicrobial peptides as potential alternatives to prevent food spoilage

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In 2015 it was estimated that on average the world consumption of antibiotics was 45 $mg \cdot kg^{-1}$ for cattle, 148 $mg \cdot kg^{-1}$ for chicken and 172 $mg \cdot kg^{-1}$ for pigs. Various studies suggested that low dosage exposure of antibiotics to livestock creates ideal conditions for the development of resistances and their spread between animals.[1] Consequently, there is an increasingly robust global campaign to ban the use of synthetic antibiotics from agriculture, livestock management and the agro-food industry (AFI). Therefore, increasing the shelf life (commercial validity) of food products, and the use of sustainable production and consumption processes are some of the current challenges faced by the AFI. Furthermore, the current increase in consumer demand for natural 'organic' foods has forced companies and researchers to explore different ways to improve their market penetration by offering products with improvements in freshness, quality and food safety.[2] This has made the AFI to suffer rapid changes in the last few years, including the use of antimicrobial peptides (AMP) as a mean of prevention of food spoilage.

AMP are well-known components of the innate immune system that are rapidly gaining relevance, as opposed to conventional antibiotics which effectiveness is declining. This is explained by a group of special features, including wide activity spectrum, high efficacy at low concentrations, and low propensity for eliciting resistant microbial strains. In the particular case of this study, peptides derived from milk proteins will be the major focus since many sequences reveal bioactive properties when released during enzymatic hydrolysis.[3] For this purpose, we have synthesised various sequences using manual and automated solid phase peptide synthesis to test on a panel of selected bacterial species susceptible to contaminate smoked sausage.

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References:

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