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Contemporary predictive Microbiology for Food safety and quality

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Predictive microbiology has been termed the quantitative microbial ecology of foods – the behaviours of bacteria and other microorganisms in foods and food processing environments including growth, survival, death and cross-contamination. By measuring the patterns of growth and inactivation and summarising data as mathematical models, they can be used to rapidly assess the behaviour of given food-associated microbes reducing the need to do extensive experimentation. Recently we have established an online, user friendly platform called CB-Premium (https://www.cbpremium.org/) that allows ready access to a continually expanding suite of predictive models. We see CB-Premium allowing rapid development of safety plans for many food commodities and for all major pathogens. CB Premium extends the value of ComBase (https://www.combase.cc/index.php/en/), a large international database of quantitative microbial growth data for foods. Alongside CB-Premium and ComBase, we continue to actively develop predictive models that extend to prediction of shelf-life of perishable foods. Specifically, we have developed and validated models to predict shelf-life end points of chilled vacuum-packed red meat that should be flexibly applicable within domestic and export meat supply chains. Such models have been developed with the concept that they are most reliable when there is assurance of consistent product hygiene and through use of appriopiate and/or innovative hurdle technology. Successful implementation of such models could be useful in developing models for other food commodities, especialy in the convenience RTE sector, providing the opportunity to not only keep food safe and nutritious but also contributing to food wastage reduction.

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