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不同贮藏温度下养殖大黄鱼货架期预测模型的构建

**Predictive model construction of shelf life for cultured *Pseudosciaena crocea* stored at different temperatures**

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中文关键词: [贮藏](#),[温度](#),[预测](#),[货架期](#),[特定腐败菌](#),[预测建模](#),[养殖大黄鱼](#)

英文关键词: [storage](#) [temperatures](#) [forecasting](#) [shelf life](#) [specific spoilage organism](#) [predictive modeling](#) [cultured \*Pseudosciaena crocea\*](#)

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中文摘要:

为探讨不同温度范围内导致产品腐败的原因和开发货架期预测模型,通过对低温(0~10℃)、室温(25℃)和变温贮藏下养殖大黄鱼感官、理化和微生物质量指标和细菌种群的研究,确定上述温度条件下的货架期和特定腐败菌,开发出3种货架期预测模型,并用恒温 and 波动温度下的货架期进行验证。结果表明,养殖大黄鱼低温下的货架期为5.4~17.8d,特定腐败菌为腐败希瓦氏菌和假单胞菌,室温下货架期仅1.1d,特定腐败菌为弧菌和肠杆菌。依据相对腐败速率与温度的相关性,开发出Exponential、School-field和Square-root货架期预测模型,模型参数表观活化能Ea、最小温度Tmin和温度特性系数a分别为74kJ/mol、-10℃和0.11,并用3、7、10℃恒温 and 变温下的货架期对模型进行验证,相对误差分别为0%~13.8%、-0.9%~9.8%和-0.2%~22.1%,表明School-field和Exponential货架期模型性能优于Square-root货架期模型,能快速有效预测0~25℃范围的大黄鱼品质。该文将为进一步研发集包装、贮藏和流通等为一体的水产品品质智能化预警系统提供依据。

英文摘要:

To investigate the causes of fish spoilage under different temperatures and develop the predictive model of shelf life, sensory, chemical and microbiological characteristics and bacterial flora of cultured *Pseudosciaena crocea* stored aerobically at low temperature from 0 to 10°C, ambient temperature at 25°C and non-isothermal temperatures were carried out, and the specific spoilage organisms in cultured *Pseudosciaena crocea* at above mentioned temperatures were also identified. And then three predictive models of shelf life were developed and validated under isothermal and non-isothermal conditions. The results showed that the shelf lives were from 5.4 to 17.8 days and their specific spoilage organisms were *Shewanella putrefaciens*, *Pseudomonas* at low temperature, and shelf life was only 1.1 days and specific spoilage organisms were *Vibrionaceae* and *Enterobacteriaceae* at ambient temperature. Predictive models of shelf lives including Exponential, School-field and Square-root equations were fitted based on the relationship between relative spoilage rates and temperatures, and three model parameters which were the temperature characteristics coefficients(a), minimum temperature(Tmin), apparent activation energy (Ea) were 0.11, -10°C and 74 kJ/mol, respectively. Three predictive models of shelf life were validated under isothermal (3,7 and 10°C) and non-isothermal conditions. According to the comparison of relative errors of three models which were 0%~13.8%, -0.9%~9.8% and -0.2%~22.1%, it showed that School-field and Exponential models of shelf life were better than Square-root model for evaluating quality of fish at 0-25°C. This paper provides a basis for developing the intelligent predictive systems of quality integrated with the package, storage and distribution of fish products.

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