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A predictive model for determination of the iodine value of coconut oil by GLC analysis of the component fatty acids

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Iodine value (IV) is one of the most important and frequently used quality control parameters of coconut oil. A study was conducted to develop a predictive model for determination of iodine value (IV) of coconut oil using gas liquid chromatographic (GLC) analysis of the component fatty acids (FA). Altogether twenty-six samples were selected to represent three sub-categories of coconut oil, namely ordinary coconut oil, virgin coconut oil, and coconut paring oil. Out of the twenty-six, fifteen samples were used as a calibration set while the remaining eleven samples were kept for validation purpose. Samples were analyzed for iodine value using the AOCS method Cd Id–92 and for FA composition using GLC detection of fatty acid methyl esters (FAME). Pearson correlation analysis between IV and individual FA indicated that lauric ($C_{12:0}$), myristic ($C_{14:0}$), palmitic ($C_{16:0}$), oleic ($C_{18:1}$) and linoleic ($C_{18:2}$) were the five parameters having strong correlation with the iodine values. When these five parameters were used as independent variables in a stepwise regression procedure, a predictive model for iodine value was obtained with $C_{16:0}$ and $C_{18:1}$ as independent variables (coefficient of determination, R^2 = 0.9611 and standard error, SE=0.93). When the model was validated with an independent set of eleven samples, the coefficient of determination was 0.946 with an overall SE of 0.95. The study concludes that the iodine value measured by the GLC method was comparable to that obtained by AOCS method Cd Id– 92.

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