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Effect of cocoa roasting temperature and processing on chocolate polyphenols content



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The health properties of cocoa have been known for millennia but, with the support of analytical chemistry and clinical studies, its real potential can be exploited. Among the reported beneficial effects, cocoa contributes to reduce blood pressure, glycemia, improve cognitive function. These effects have been attributed to a plethora of antioxidant compounds. Unfortunately, polyphenol content is reduced during cocoa fermentation, drying, roasting and the other phases of chocolate production. We studied the variation of polyphenols content during all the different phases of chocolate production, with a special emphasis on roasting (three different roasting temperatures: 79, 101 and 133°C). Three cocoa bean sample have been followed during all the process to produce chocolate by analyzing the total polyphenols content (Folin-Ciocalteu assay), the antioxidant power (FRAP assay), the epicatechin content (HPLC and GC/MS), and epicatechin mean degree of polymerization (phloroglucinol adducts method). Results showed a similar trend for total polyphenol content and antioxidant power with an unexpected bell-shaped curve: An increase followed by a decrease for the three different roasting temperatures. At the intermediate temperature (101°C), the higher polyphenol content was found after roasting originating an asymmetric bell-shaped curve. Epicatechin content had a trend similar to that of total polyphenol content but, interestingly, the mean degree of polymerization data has the opposite behavior with some deviation in the case of the highest temperature, probably due to epicatechin degradation. It seems that roasting is able to free epicatechin from oligomers that can be partially reformed during the following treatments.

Biography

Alessandro La Mantia is a Chemist, working in the Food Fraud Laboratory of the Italian Ministry of Agriculture. At the moment, he is in leave to complete his 3rd year of PhD at the School of Advanced Studies of the University of Camerino. He is expert in isotopic ratio mass spectrometry analysis of food matrices. He has published six full length papers and presented his results in more than 10 national and international meetings.

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