

DETERMINATION OF CARMINIC ACID (E120) IN FRESH SAUSAGES USING A SIMPLE EXTRACTION METHOD FOLLOWED BY LC-HRMS ANALYSIS

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Carminic acid (E120) is a natural, water soluble red dye, secreted by the cochineal insect as a deterrent to predators. It is stable under conditions of indoor scattered rays, large temperature range, pH variation and oxidation-resistant [1]. This colorant is used for several uses from ink to cosmetics and foods. Regards food, it is usually added to preserve and maintain the red color of meat products during their shelf-life as well [2]. The quality of fresh meat products so may be compromised by this not admitted procedure. On this purpose, Regulation 1129/11/EC [3] prohibits the use of E120 in the fresh meat preparations, which also includes sausages. The aim of this study was to develop a method for carminic acid determination and to detect it in fresh sausages in order to guarantee to consumers a product free of illegal dye addition. In literature, almost all works detect carminic acid by liquid chromatography with UV Detector (LC-UV) system or use elaborated extraction procedures for different foods, especially for drinks [2]. In this work we developed a simple liquid extraction method with water, followed by a defatting step with hexane before analysis by liquid chromatography coupled to high resolution mass spectrometry (LC-HRMS). The LOD and LOQ of the method were 3 and 10 $\mu\text{g}/\text{kg}$, respectively. The recovery was 99%. The other performances of the analytical method, effectiveness and robustness particularly, were evaluated following the Decision 657/2002/EC [4]. The protocol was then applied on 95 fresh sausage samples collected from different supermarkets and food suppliers, showing 23% of non-compliance with concentrations ranging from 45 to 1218 $\mu\text{g}/\text{kg}$. The E120 evidence, not indicated on the product label of the sausages, collected directly from the different stores, suggests the importance of monitoring fresh products, safeguarding consumer health.

[1] Zhang J, Li Z, Zhao J, Yang S, Bao S. Study on stability and determination methods of carminic acid extracted from *dactylopiuscoccus costa*, *Food Science*, 28: 321–326, 2007. [2] Yamjalaa K, Nainara MS, Ramisetti NR. Methods for the analysis of azo dyes employed in food industry - A review. *Food Chemistry*, 192: 813–824, 2016. [3] European Community. Commission Regulation (EU) No 1129/2011 amending Annex II to Regulation (EC) No 1333/2008 of the European Parliament and of the Council by establishing a Union list of food additives, *Official Journal of the European Union*, 295: 1-177, 2011. [4] European Community. Commission Decision 2002/657/EC concerning the performance of analytical methods and the interpretation of results, *Official Journal of the European Union*, 221: 8–36, 2002.