

PN4: Characterization of almond oils and cakes, obtained from broken almonds discarded by sorting during shells' cracking process for almond kernels separation

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Abstract:

In eastern Morocco, after harvesting, cracking of hard shells, for manual separating of almonds is traditionally performed by rural women. Fortunately, along this later decade, almond production has increased significantly and farmers organize themselves into cooperatives, some of which are now equipped with almond cracking and shelling machine. Undamaged almond are separated from shell fragments. Partly damaged or broken almonds are sorted and collected to be used for almond oil's extraction in order to give them the best commercial added value. This work focuses on the characterization of oilcakes and almond oils extracted from the main sweet almonds (Marcoma, Fournat, Ferragnes/Ferraduel and Beldi) cultivated in this region. Oil contents, triacylglycerols and fatty acids profiles tocopherols, total phenols, carbohydrates, proteins, fiber and ash compositions were determined. Thus, CPG-FID analysis of fatty acids (FA) of almond oils (AO) shown the dominance of two FA oleic acid (C18:1) and linoleic acid (C18:2); Almond Oils of *Ferragnes/Ferraduel* association and Beldi show the highest percentage values of C18:1 respectively of 70.33% and 62.09 %. *Marcona's* almond oil shows the lowest content of C18:1 (57.54 %). HPLC analysis of triacylglycerols shown that analyzed almond oils are characterized by the dominance of trioleylglycerol (OOO). Tocopherols and phenols are the natural antioxidant analyzed in the studied almond oils. Results show that the α -tocopherol is the principal homologue of tocopherols of AO, its contents range between a minimum of 231.24 mg/kg for Beldi and 332.24 mg/kg for *Ferragnes-Ferraduel*. Total phenols range from 99.60 mg/kg for *Fournat* to 220.15 mg/kg for *Marcona*. Carbohydrates, fiber, ash and proteins were analyzed in almond oilcakes. They range respectively for: (1) Carbohydrates between 15.02% for *Marcona* and 19.21% for *Fournat*; (2) Fiber between 32.8 % for *Fournat* and 35.5% for Beldi; (3) Ash between 4.75% for *Marcona* and 7.25% for *Fournat*; (4) Proteins between 43.9% for Beldi and 48.5 % for *Ferragnes/Ferraduel*.

According to the observed results we conclude that *Ferragnes/Ferraduel* seems to be the best source for almond oil among the analyzed almond oils, his richness of tocopherols allow good stability to oxidation; Equally , the corresponding oilcake seems to be an interested source of proteins and fiber to be valued for human nutrition

Keywords: Almond oils, Fatty acid, Triacylglycerol, tocopherol, carbohydrates, fiber, ash, protein