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Influence of thermal processing on carotenoid content and antioxidant activity in berry's pulp

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The capacity to improve the health of the population depends greatly on the quality of the consumed food, which is in turn influenced by their thermal processing. Berries can be eaten fresh, frozen or dried. For research, 3 types of berries from the Republic of Moldova were selected: sea buckthorn (*Hippophae rhamnoides*), rosehip (*Rosa canina*) and mountain ash (*Sorbus aucuparia*), which can be recommended for producing functional food as a source of biologically active compounds as natural dyes and antioxidants. The aim of the study was to investigate the influence of thermal processing on carotenoid content and antioxidant activity in berry's pulp. Berries of native indigenous population were selected for the needs of the current study. Harvest took place from September to November 2018. Fruit was frozen at temperature of $-18\pm 1^{\circ}\text{C}$ and dried at room temperature and at temperature of $65\pm 1^{\circ}\text{C}$. The carotenoid content and antioxidant activity in berry's pulp were comparatively determined by spectrophotometric and high performance liquid chromatography (HPLC) methods. Antioxidant activity was determined using the method based on stabilized silver nanoparticles. In the case of frozen berries, the highest carotenoid content was recorded in rosehip, followed by sea buckthorn and mountain ash. Thus, the carotenoid content varied, for frozen berries, between 37.16 ± 1.2 mg/100g dry weight and 68.73 ± 5.02 mg/100g dry weight. The carotenoid content decreased by approximately 2-fold in the dried sea buckthorn, of 1.3 times in the dried rosehip and of 1.6 times in the dried mountain ash. The temperature of the drying agent did not essentially influence the carotenoid content of the dried berries. The antioxidant activity of the thermal processing berries was also investigated. In the case of frozen samples, the highest antioxidant activity was observed in mountain ash berry (with an average of 440.66 ± 3.15 mg GAE/100 g dry weight) followed by rose hip berry (430.47 ± 6.13 mg GAE/100 g dry weight) and the lowest in case of sea buckthorn (148.82 ± 0.17 mg GAE/100 g dry weight). Antioxidant activity of dried berries at 65°C was found to be higher than that of frozen samples. Thus, thermal processing has been found to have a different influence on the carotenoid content and antioxidant activity in the investigated berries.