

## INFLUENCE OF THE EDIBLE COATINGS' VISCOSITY ON ORGANOLEPTIC CHARACTERISTICS OF WALNUT KERNELS

Boistean Alina, Chirsanova Aurica, Natibulina Maria

Technical University of Moldova

Boistean Alina alina.boistean@toap.utm.md

**Abstract:** Walnut (*Juglans regia* L.) is widely distributed throughout the world. In this research work compares the effect of viscosity of coating solutions, based on whey protein isolate and gelatin, on organoleptic characteristics of walnut kernels. At the same time, it is possible to note the relationship between the viscosity of the coating solutions and the thickness, uniformity, as well as the appearance of the covered kernels.

**Keywords:** walnut kernels, viscosity, coatings, whey protein isolate, gelatin.

The walnut has gained popularity because of its specific attractive organoleptic properties and high levels of essential fatty acids and bioactive components such as antioxidants. Walnut production is widely distributed all over the world and currently it ranks third in terms of global nut production after cashews and almonds (Pereira et al., 2008) [1]. The theme of extending the shelf life and improving the quality of walnut kernels for sale will always be relevant. (Ernest H. Wiegand, 1927; Linda J. Harris, 2013) [2,3].

Recently, more and more scientists are working to develop new type of edible coatings, which wouldn't change the physico-chemical and microbiological parameters of walnuts during storage, but rather improve them. (L. Atarés et al., 2016) [4].

High quality walnuts ("*Juglans regia*") of "Cogalniceanu" variety of the harvest year 2017 were selected for the study. The quality of walnuts corresponded to the normative document UNECE STANDARD DDP-01: 2013 [5].

Studied walnut kernels were covered with two types of edible coatings. The first type of coating is developed on the basis of the method given in the article by the authors Wang L. and others, Elsevier (2010) [6]. The main component of this coating is whey protein isolate.

The second type of covering is developed on the basis of the patent of authors Nikolaenko N. S. and others [7]. The main component of this coating – food-grade gelatin.

Analyzing the overall assessments of each of the samples, we can say that kernels with gelatin coating (1 and 2 layers) have the best results, because these samples are most similar in all respects to natural walnuts without coating. The best overall assessment in such indicators as appearance and color was received by the sample covered with gelatin coating in 1 layer, while nuts with whey coating received a low score on these indicators due to their unnatural color, white inclusions and unsightly appearance. The samples with gelatin coating also have the highest score for the kernel peel integrity. The whey-based coating significantly influenced the integrity of the peel, damaging it in some places. But judging by the estimates for the uniformity and thickness of the coating, it follows that the gelatin coating in one layer looks better than the same coating in two layers. We can

also note that the samples covered with whey-based solution in one layer look more attractive than those that covered with two layers.

The results of the experiment revealed that the organoleptic qualities of the coated walnut kernels directly depend on the viscosity of the coating solutions. Experiments have determined that gelatin solution has the optimal viscosity for the coating at 20 C, because the samples in gelatin coating are rated higher than the samples in whey-based coverage as a result of organoleptic analysis. At the same time, 1-layer gelatin-based coating was more uniform than the same coating in two layers during visual inspection. Perhaps it is due to the fact that the solubility of the substances that make up the gelatin coating isn't the maximum, which requires a more detailed study.

The viscosity of the solution based on whey protein at 20 C is lower than the viscosity of the gelatin solution, and therefore, it penetrates into the upper layers (under the peel) of the kernel and changes the product at the physico-chemical level. Whey-based coating lay unevenly on the surface of the walnuts kernels, because of what, in places of its accumulation white plaque forms, which had a negative impact on the organoleptic assessment of appearance. From the work done, it can be concluded that for further research it is desirable to use a gelatin-based coating.

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