

THE INFLUENCE OF FOOD COATINGS ON THE MICROBIOLOGICAL STATE OF WALNUT KERNEL

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Abstract: Walnuts (*Juglans regia* L.) are widespread throughout the world. This paper compares the effect of food-based coatings based on serum protein and gelatinous isolate on the microbiological state of the nut kernels surface. For the purity of the experiment, two methods were used for all samples: deep and surface seeding. At the same time, it is possible to note the relationship between the number of germinated colonies, the type of coverage and the time of storage of the kernel.

Keywords: walnut kernels, coatings, microflora, moulds, fungi, whey protein isolate, gelatin;

In recent years, innovative techniques for enhancing the shelf life of walnuts have been reported for instance the use of edible coatings and films has made great advances toward improving product quality and providing stability to foods against various physicochemical hazards (Andrade, Skurtys, & Osorio, 2012) [1]. Recently there has been a wealth of reports on the preparation of biodegradable and environmental friendly edible films and coatings from natural sources (Atares & Chiralt, 2016; Pineros-Hernandez, Medina-Jaramillo, Lopez-Cordoba, & Goyanes, 2017)[2,3]. Numerous studies have also been carried out on the development of an antimicrobial component for food coatings, which is an important factor in preserving the kernel of various types of nuts and other products (R.Ribeiro-Santos et al., 2017; JF Martucci et al., 2017) 4,5]. One of the antimicrobial and antifungal ingredients studied, which attracted a lot of attention and gives good results, is ginger and its products (N. Noshirvani et al., 2017) [6]. Since the presence of molds on walnut kernels compromises the quality of the product for sale, due to the threat of detection of microtoxins - products of their vital activity (John F. Leslie et al., 2008) [7].

The purpose of this study is to develop a food coating for walnut kernels, to reduce the microbiological contamination of the kernels surface, to reduce the level of molds to prevent their development during storage.

For the study, were selected walnuts (*Juglans regia* L.) of the Kogelnichanu variety of the highest quality of the 2017 crop. The quality of walnuts conforms to UNECE STANDARD DDP-01: 2013 [8]. For purity, walnut kernels in two types of coating (on a gelatin base and on a whey basis) were stored for 5 months, after which they were subjected to microbiological research along with freshly covered walnut kernels that were stored for 2 weeks. Walnut kernel data was covered with two types of food coatings. The first type of coating was developed based on the method described in the article by the authors Wang L. et al. Elsevier (2010) [9]. The main component of this coating is whey protein isolate. The second type of coating is developed on the basis of the patent of authors Nikolayenko N.S. et al. [10]. The main component of this coating is edible gelatin.

The results of the experiment revealed that food coatings with the addition of antimicrobial and antifungal ingredients have a positive effect on the microflora of walnut

kernels. Microbiological analysis showed that the largest number of molds was found on samples stored for 5 months. Moreover, the samples covered with whey were covered with more molds than the sample with a gelatinous coating. This can be explained by the fact that due to the presence of whey protein is formed a favorable environment for the development of microorganisms. In the deep seeding method, mold was found only in samples with a gelatin coating, and in the contact method, only with a serum one. As a result, it can be said that walnuts that have been stored for 5 months under natural conditions are not a reliable product for sale and consumption, as among the molds were found on their surface as: *Fusarium* and *Aspergillus*, which can serve as sources of mycotoxins.

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