

USING OF WASTE PRODUCTS AS A FUNCTIONAL RAW MATERIAL IN FOOD INDUSTRY

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Abstract. *Nowadays, one of the most important tasks in the food industry is the rational use and processing of waste. There is a steady increase in the production of food products which are necessary to ensure the country's health security. The consequence of the increase of capacity in the food and processing industry, hence, there is the increase of the amount of waste, that in turn, leads to the problem of utilization of waste, which is truly a complex measure. The waste can be used as valuable food components, defined by the term "secondary material resources". There are many ways: optimization (animal food); recycling, incineration, composting; obtaining fuel, as well as obtaining useful and functional products. Waste preserves many useful properties of primary raw materials and can be used as secondary resources for the production of feed, food and technical products. This work is aimed at developing scientifically based solutions, which are necessary for the implementation of a rational and proper technology of the using the secondary products in the food industry. Therefore, it is relevant and necessary to increase the degree of processing of raw materials, their complex use, and thereafter the extraction of valuable components from it.*

Key words: *waste management, raw material, functional products, beta glucan, grape seed, malt sprouts, potato waste, meal.*

The Republic of Moldova is an agricultural country. Actually, a significant part of the republic's population lives in rural areas, about $\frac{1}{3}$ is employed in the agricultural sector. Thereby, the problem of waste, after processing raw materials, remains opened. In this regard, rational methods have been developed to process and use the secondary stock to obtain new functional products. The importance of functional and nutraceutical food products becomes vital and increases every day.

Yeast is a waste product of wine and beer production and it is a valuable secondary raw material which contains beta glucan. Studies have shown that foods, which contain this substance, lower blood cholesterol, maintain blood sugar, and improve the immune system. In yeast, beta glucan is located in the inner layer of the cell wall. One of the common methods of production beta glucan is the treatment of yeast with hydrogen pyroxide, which ensures a high yield of this substance. Yoghurts; functional drinks have been invented as new functional products [4]. Due to research, the addition of Beta-Glucan decreases the fermentation time, improves the viscosity of yoghurt and the firmness of curd, so it can be used as a substitute of fat and stabilizers. This results in increasing the productivity and the profitability of producers. Finally, the addition of Beta Glucan as a nutraceutical substance can protect consumers from many diseases such as diabetes mellitus and atherosclerosis [3].

The Republic of Moldova is famous for growing a wide range of grapes and producing high quality wines. Due to statistics, the wine-making sector in the Republic of Moldova processes 300-350 thousand tons of grapes per year. Due to the significant increase in grape processing, the number of secondary products of winemaking (grape marc, squeezed yeast, seeds), which make up 20% of the processed grapes and are a valuable raw material for a number of products, is correspondingly increases. The content of the seeds in a ton of grapes represents almost 7% of the mass. For example, grape seeds contain a number of essential fatty acids, tocopherols, tannins, and anthocyanins. Grape oil is obtained from grape seeds contained in the pomace of grape. The

content of grape seed is 25-30% from the mass of grapes; and grape seeds, in turn, contain 10-20% of the oil. Oil is extracted in two ways: pressing and extraction. At the Technical University of Moldova on the faculty Food Technologies, series of functional food products have been developed: functional emulsions such as mayonnaise; functional spreads; and etc [1].

According to research, the grape skin contains a large number of condensed tannins; which are excellent antioxidant and antimicrobial materials, which are used as preservatives in the food industry. Currently, a series of functional desserts with grape skin extracts are developed at the Faculty of Food Products at Technical University of Moldova. Moreover, the grape skin is widely used in the cosmetic industry for the production of creams, peels, masks and other cosmetic products [1].

Malt sprouts serve as waste after drying of malt in the brewing industry. They are a promising raw material for the production of functional food products due to their high nutritional and biological value. The extract from malt sprouts is used to activate pressed yeast in bakery. Adding this substance to the sponge, the content of thiamine (vitamin B1) in the dough increased to 20%, and the content of tocopherol (vitamin E) increased to 1.6 mg. Malt sprouts are also used in the surface cultivation of molds. About 25% of wheat bran were replaced by cheaper sprouts. The ground becomes looser, which contributed to better aeration of the vertical layers. The extract from malt sprouts, obtained by insisting at a temperature of 60 ° C for 2 hours, is used as nitrogen and phosphorus nutrition in the production of vinegar. If the solids content is 4.5%, the extract contains 65-70 mg of mineral phosphorus [2].

Meal is a by-product of the extraction the oils from seeds of plant crops. (sunflower, rapeseed, soy, peanut, corn). Sunflower meal contains a large amount of lysine and methionine, as well as vitamins B and E, phosphorus and potassium. Meal is used as feed for farm animals. For example, feeding the cows with meal, the milk yield rises, and the milk fat content also increases. Walnut meal is a valuable dietary supplement, which contain vitamins B, A, C, E, lecithin, and fiber. It is well to add this substance meal to soups, cereals, salads, yoghurts and pastries. In the Technical University of Moldova the meal was used to produce halva.

To sum up, the Republic of Moldova is an agricultural region, where agricultural industry is widely developed. In this regard, the problem of waste disposal remains open, which requires a rational and effective approach. In this article it is reported about processing of secondary raw materials, and using them for the production of functional products, which in turn are widely recognized and popular among the population. After all, functional nutrition involves eating foods, which improve the physiological processes in the body, which helps to maintain a healthy lifestyle for a long time. Also, many types of products can be used not only in the food industry, but also in the cosmetic, as well as the production of livestock feed. Thus, the waste management requires special attention of the authorities to optimize methods in order to maintain the state of ecology at the proper level.

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