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Research Article

TECHNOLOGICAL FOUNDATIONS OF STORAGE AND PROCESSING

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Raxmonov Dilmurod Xusanboyevich
Assistant, Fergana Polytechnic Institute, Fergana, Uzbekistan

ABSTRACT

Recently, in the world, special attention has been paid to improving the efficiency of food production, solving the problems of import substitution and improving the quality of food products in the field of technological processes and production automation. The efficiency of technological processes of storage of oil raw materials depends to a large extent on technological storage conditions and environmental conditions. In this regard, one of the important tasks is the implementation of specialized software embodying the strategy implementing the development of Smart-systems based on the predictive model of the studied object in developed countries. At the same time, it is an urgent task to automate technological methods of raw material storage, as well as to develop systems for controlling environmental parameters and a number of other factors.

KEYWORDS

Oil raw materials, technological processes of production, valuable components, initial and final products.

INTRODUCTION

Scientific research and development aimed at the development of improved systems for the storage of oily raw materials are being carried out in Jakhan. One of the important tasks in this field is the development of Smart-warehouses that use the remote control of the microclimate of

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warehouse buildings, which allows for minimizing the loss of oily raw materials while preserving the valuable components of agricultural products [1,2,3].

One of the main tasks of the state is to preserve all the crops grown and use them wisely, to get the maximum output from raw materials. Due to the seasonality of agricultural production, oilseeds need to be used for different needs throughout the year or more. The development of the science of storage of oily raw materials and the widespread introduction of mechanization into the storage processes made it possible to implement new improved technological methods that ensure the reduction of product loss and reduction of storage costs. Every specialist in the storage of oilseeds should know the quality of oilseeds and methods of increasing it, the nature of the loss of oilseeds and the organization of their storage, as well as the rational methods of processing oilseeds [4,5,6,7].

THE MAIN PART

Production processes at oil refineries can be divided into two main stages. This is due to the fact that the storage of oily raw materials is characterized by the loss of some valuable components. Although the first group of operations is much simpler than the second group in terms of apparatus and technology, the loss of raw materials and valuable components is almost equal and even superior when viewed in terms of losses in all subsequent stages of industrial processing.

In accordance with the accepted structure of the presentation of the technological processes of the main production, we will consider a number of their specific features.

Raw material storage processes. According to the technical operations of the first group, all enterprises processing oil raw materials can be classified into two main types.

The first type includes oil plants where raw materials are subjected to long-term storage before industrial processing. During the storage of raw materials, various biochemical processes occur, which lead to the loss of some of the useful substances contained in the raw materials.

Respiration during the storage of oilseeds is the most important and significant indicator of their durability. During respiration, cells receive energy from the oxidation and decomposition of organic matter in seeds, which is observed with the loss of solid substances: carbohydrates, fats, and proteins, that is, valuable components necessary for extraction during industrial processing [8,9,10].

The second factor that significantly affects the safety of raw materials is their mixing with the seeds of foreign plants and the development of microorganisms. For example, acceptance for storage when done, oilseeds have much diverse microflora.

Microorganisms get into the seed mass in the field, threshing and under conditions suitable for their development. Oilseeds are good, nutritious food for microorganisms, and under certain

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conditions, they can become active, causing significant spoilage of the seeds [11,12,13,14,15].

The third factor that significantly affects the process of storage of raw materials is self-healing. It helps to preserve all types of plant raw materials under conditions that accelerate physiological and biochemical processes. All living components of the raw mass: seeds of the main vegetation, weed seeds, microorganisms, and pests emit heat and moisture when they breathe. Due to the poor thermal conductivity of the raw material, heat accumulates in it, which leads to an increase in temperature and humidity, according to [3] the temperature in the seed mass can be 65-75 °C and higher.

Thus, all of the above factors contribute to a significant increase in the overall loss of valuable components in the raw material [16,17,18].

In addition to the above factors, the storage period for oil raw materials is also important. The time factor, which significantly affects the qualitative and quantitative characteristics of raw materials, should be considered an effective means of managing the entire process of processing agricultural products.

Processing industry processes. The processes of the second group describing the direct industrial processing of raw materials can be classified according to the identification of their physicochemical properties, i.e. material and energetic internal connections.

For most of enterprises processing perishable agricultural products, the following typical processes can be distinguished: mechanical, hydrodynamic, heat, mass exchange, and chemical-biological processes [19-21].

These types of technological processes may differ in terms of equipment design, properties of processed substances, initial and final products, etc. However, they are based on the same principles. The conditionality of this classification is, first of all, one or another set of processes (combination of mass exchange with heat exchange in certain hydrodynamic regimes, etc.) found in most of the technological processes, and this is done in the construction of mathematical models. should be taken into account.

At the same time, the assessment of all industrial processing processes should be carried out from the point of view of their impact on the loss of valuable components and the preservation of quality indicators.

Analysis of a large group of technological devices designed to extract valuable components from raw materials, due to the nature of various processes, shows that they all have a characteristic feature: the number of valuable components obtained from raw materials significantly depends on the time of their stay in the device. It follows that the residence time in the device is, therefore, one of the important factors from the point of view of the problems of optimal management of the considered group of objects.

CONCLUSION

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Thus, a brief review of the technological basis of oil storage processes shows that, despite the differences in hardware and technological plans, these processes lead to a significant loss of raw materials and semi-finished products. It is important to note that loss increases with time in raw material storage processes, and decreases in processing. The mentioned situation shows the expediency of considering the processes of the first and second groups as a single technological complex of "raw materials shop - raw materials processing shop" in solving management issues from the point of view of reducing the loss of agricultural raw materials.

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