This paper presents the results of studying the effect of cyclodextrins on the activity of hydrolytic enzymes obtained from Medusomyces Gisevii Lindau (kombucha) and chicken bursa of Fabricius, a waste product from poultry farms.

In the presence of cyclodextrins, the activity of enzymes (amylase and lipase) obtained from kombucha increased markedly during storage compared to control samples. The stability of the protease in the presence of cyclodextrins remained virtually unchanged. They were observed at an optimal ratio of 4:1 (cyclodextrin: enzyme). This process is because cyclodextrin binds to these structures due to additional molecular interactions, which leads to increased stabilization and activation of amylase and lipase. Still, at the same time, the proteolytic effect of proteases on lipase and amylase is reduced.

The activity of the protease enzyme obtained from the bursa of Fabricius of chickens was maintained for four days at an enzyme: cyclodextrin ratio of 1:2. Thus, in this formed complex of enzymes with cyclodextrins, a stabilizing effect of nanostructures on proteases is observed. Moreover, the data obtained showed that cyclodextrins have a stabilizing effect on hydrolytic enzymes aimed at preserving the activity of enzymes, which is essential for food storage.

When using cyclodextrins in a ratio of 1:2 with enzymes (protease) obtained from the bursa of Fabricius and at an optimal ratio of 4:1 (cyclodextrin: enzyme) with enzymes (lipase and amylase) obtained from kombucha, significant preservation of the activity of these enzymes was observed. The use of cyclodextrins in the food industry to increase the shelf life of corresponding food products is promising.

CONCLUSION

Hydrolytic enzymes (amylase, lipase, protease) are widely used in the food and pharmaceutical industries for the prevention of diseases, namely in the production of dietary supplements, which is essential in the field of functional nutrition, and therefore for maintaining optimal health, reducing the risk of chronic diseases and managing their symptoms using functional nutrition.[35]

One of the primary challenges in hydrolytic enzyme production is preserving their activity.

experimental part. Kucherenko A.N., Karavaeva L.I., and Glazova N.V. participated in writing and editing the manuscript. Kiprushkina E.I. advised on manuscript writing and editing. All authors read and approved the final manuscript.

Fortunately, b-cyclodextrins have been found to enhance enzyme activity, making them a vital component in maintaining enzymatic functionality.y establishing an optimal cyclodextrin-to-enzyme ratio, it is possible to utilize a minimal amount of b-cyclodextrins while sustaining enzyme activity over an extended period.

At a 1:2 ratio of cyclodextrin/enzyme (protease) obtained from the bursa of Fabricius and at a 4:1 ratio of cyclodextrin/enzyme with enzymes (lipase and amylase) obtained from kombucha, significant preservation of the activity of these enzymes was observed for four days.

The use of cyclodextrins in the food industry holds great promise for extending the shelf life of functional foods. These foods, which are rich sources of bioactive compounds such as hydrolytic enzymes (lipase, amylase, protease), can benefit significantly from the stabilizing effect of cyclodextrins, thereby enhancing their role in functional nutrition.

List of Abbreviations: CD: cyclodextrin; CGT: cyclodextrin glucosyltransferase; TCA: trichloroacetic acid; FFC: Functional Food Center

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