

Ministry of Education and Science of Ukraine

National University of Food Technologies

90th
International scientific conference
of young scientist and students

"Youth scientific achievements
to the 21st century nutrition
problem solution"

April, 11-12 2024

Part 2

Kyiv, NUFT, 2024

Міністерство освіти і науки України

Національний університет харчових технологій

**90-та
Міжнародна наукова
конференція молодих учених,
аспірантів і студентів**

**"Наукові здобутки молоді –
вирішенню проблем
харчування людства у ХХІ
столітті"**

11-12 квітня 2024 р.

Частина 2

Київ НУХТ 2024

3. Machine-apparatus chart for the production of beta-glucan from spent brewer's yeast

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Introduction. An important step in extracting beta-glucan is the destruction of yeast cells. The description of the machine-apparatus chart for this production of beta-glucan from the walls of used brewer's yeast is not available in the scientific and technical literature.

Materials and methods. The development of the scheme was carried out on the basis of a survey of specialists and analysis of modern scientific works on the destruction of cells of microorganisms, extraction and purification of beta-glucan.

Results and discussion. The scheme (Fig. 1) provides for the extraction of large impurities from the cellular biomass on the sieve 2, the removal of bitter compounds in the reactor 3, the concentration of cells in the centrifuge 4, the autolysis of cells in the reactor 5, their destruction in the bead mill 6, the separation of their contents from the walls of the centrifuge or nozzle separator 7, extraction of beta-glucan from cell walls in an extractor 8, separation of the walls from the extract in a centrifuge or separator 9, concentration of beta-glucan by dialysis on membrane filters 10 and its drying in a spray dryer 11.

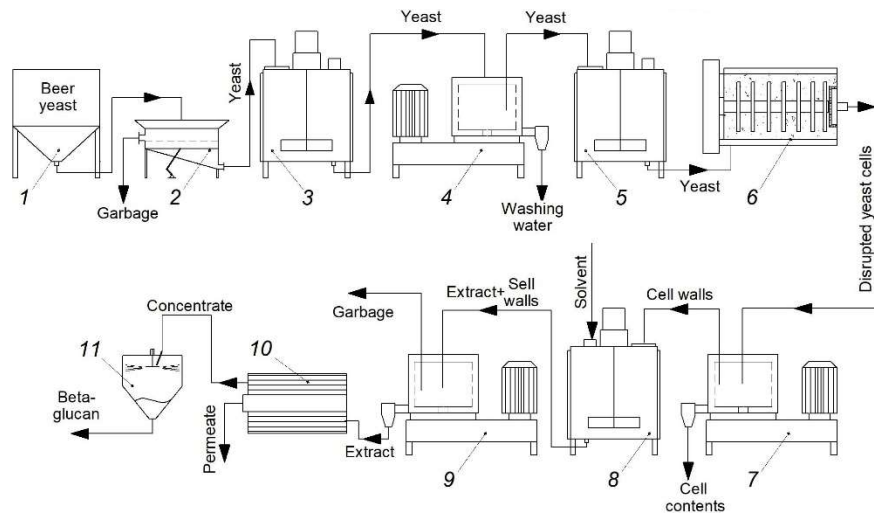


Fig. 1. Machine-apparatus chart for the production of buta-glucan from used beer yeast

Destruction of cells occurs in a bead mill. Attention should be paid to the concentration of the yeast suspension and the ratio of the suspension to the beads. The recommended bead size is 0.5 mm.

Conclusions. The process of industrial destruction of used brewer's yeast needs research.

The developed chart can be used in the educational process of engineering of food, pharmaceutical and biotechnological industries.

References

1. Avramia, Ionut, Sonia Amariei (2022), A Simple and Efficient Mechanical Cell Disruption Method Using Glass Beads to Extract β -Glucans from Spent Brewer's Yeast, Applied Sciences, 12(2), 648.
2. Теличкун В.І., Теличкун Ю.С., Губеня О.О., Стефанов С.В., Дамянова С.Т. (2024), Технологічне обладнання харчових виробництв: Навчальний посібник, Видавництво «Сталь», Київ.
3. Теличкун В.І., Гавва О.М., Теличкун Ю.С., Десик М.Г., Чепелюк О.М. (2017), Технологічні комплекси харчових виробництв, Видавництво «Сталь», Київ
4. Ionut Avramia (2022), Research on the extraction of β -glucans from spent brewer's yeast and their valorization in bioactive films. Doctoral thesis, "Ștefan cel Mare" University Of Suceava