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OBTAINING FORAGE YEAST BY EXTRACTION

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The article describes a new design of an extractor and a method for producing fodder yeast to replenish the fodder base of agriculture. Fodder yeast can be obtained from any organic waste of human economic activity.

Key words: Fodder yeast, extractor, biologically active substances, dietary supplements.

Introduction. It is known that combined feeds are the main feed for agricultural and wild animals, pigs and birds. However, at present, compound feed contains exclusively grain crops in crushed form, there is a complete absence of macro- and microelements, protein enzymes, vitamins. Due to the lack of high-grade protein substances in feed for farm animals, numerous attempts are being made to find additional food sources in the form of biologically active substances (BAS) and biologically active additives (BAD). In this way, research is stimulated to increase protein resources using advanced technologies such as protein synthesis.

It is known that during the fermentation of plant hydrolysates, microbial biomasses are obtained, containing a large amount of protein substances, vitamins, enzymes that are much superior in nutritional value to plant feed. When microbial masses are included in compound feed, their nutritional properties are significantly increased. Microbial biomass can multiply and grow in mass like the well-known brewing yeast. Therefore, it is appropriate to call them "feed yeast". Previous studies have made it possible, since 1994, to begin using nanotechnological methods in the pharmaceutical, chemical and food industries. In the nanotechnological direction, microorganisms can also be used to obtain proteins, enzymes, and various nanoparticles inside cells, which allows them to be used not only in the chemical industry to obtain biologically active substances and dietary supplements, but also in other industries, for example, in the cultivation of the yeast *Schizosaccharomyces pombe* in cells metal-peptide complexes are formed - microcrystallins with a size of slightly less than 2 nm, actual quantum dots, which can be used in semiconductor devices.

Research methods and tools. Nanotechnology has become in demand, new tools have appeared that make it possible to produce images, measure, and manipulate atoms and molecules of matter at the nanoscopic level. The development of nanotechnology was also promoted by the discovery in nature of a new form of carbon existence - fullerenes and carbon nanotubes (1990-1991). Silicon and non-carbon nanotubes called nanowires have also become famous.

The size of the nanoparticles depends on the culture of the microorganisms. Fodder yeast can be obtained from any waste of sugar-containing agricultural raw materials, including waste from various sectors of the food industry, forestry waste and others. A set of technological equipment for production - containers for the preparation and storage of raw materials, products, heat exchange and sterilization devices, fermenters, extractors, filter devices, dryers, filling machines, weighing equipment, etc. Before hardware production, small equipment and tools are used: test tubes, shaking flasks, beakers, Kjeldahl apparatus, analytical balance, microscopes, Goryaev's chamber, various reagents and other equipment.

Experimental part. In the scientific laboratory of the department "Technological machines and equipment. Agroengineering" researches are carried out on the waste of

livestock and pig complexes on fermenters and extractors, the main biotechnological equipment.

Figure 1 shows a diagram of an experimental extractor, the design of which is protected by a patent [1].

The laboratory version of the extractor was tested at the Ulan-Ude poultry farm. Two batches of birds were selected as subjects. The first is experimental. Second control. Each batch consisted of 15 pieces. The control was carried out within a month. The birds were fed the same, but yeast obtained from the extraction was added to the feed of the experimental batch. The birds eagerly ate and put on weight. No significant weight gain was observed in the first week. By the end of the observation, the weighing results showed that the weight gain in the experimental batch was 17%, in contrast to the control batch.

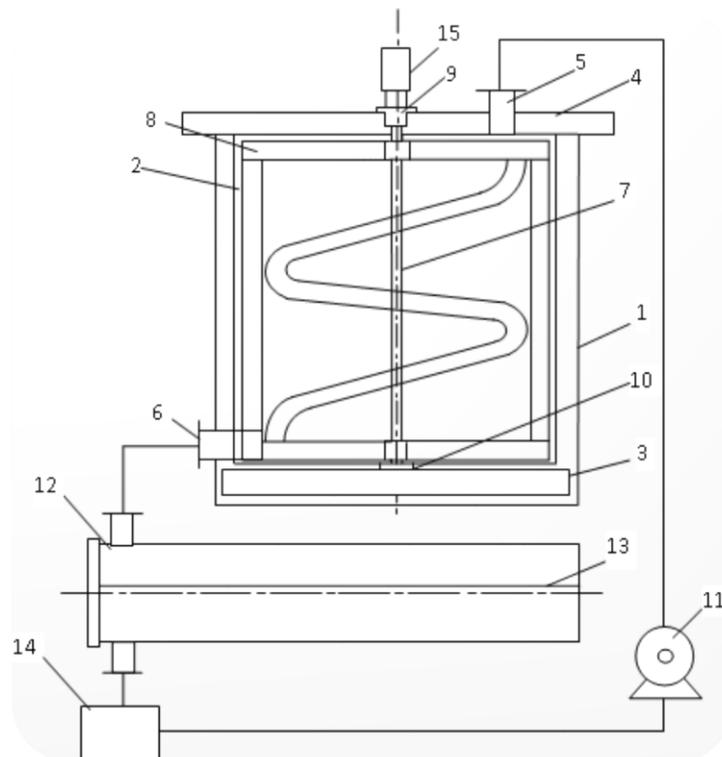


Figure - Diagram of the experimental extractor: 1 - body; 2 - working capacity; 3 - tubular electric heater; 4 - cover; 5, 6 - branch pipes for raw material and extractant supply, extract recirculation, extract drain; 7 - shaft; 8 - two-level mixer; 9 - a seal that transfers rotation from the gear motor to the shaft; 10 - fluoroplastic bushing; 11 - centrifugal pump; 12 - extract settler; 13 - coarse filter; 14 - container for collecting and recycling the extract; 15 - gear motor.

Results and discussion. The conducted researches revealed that the situation with the fodder base in agriculture is unfavorable. The main share of combined feed used for feeding farm animals is crushed grain crops. In the composition of compound feed, the proportion of minerals, vitamins is either negligible, or completely absent. And this situation is explained by the lack of effective technologies and technological equipment.

Conclusions. It is necessary to raise the fodder base, improve the ration of feeding birds, introducing macro and micro supplements. The proposed new designs of extractors and other necessary equipment will raise the level of fodder yeast production, and agricultural producers will be able to feed the animals with better quality.

Bibliography

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