TECHNOLOGY OF STABILIZATION OF ACTIVE FEED YEAST

Bogdan IEGOROV[1], ORCID: 0000-0001-7526-0315
Alla MAKARYNSKA[1], ORCID: 0000-0003-1879-8455
Olena KANANYKHINA[2], ORCID: 0000-0001-6291-7760
Tetiana TURPUROVA[1*], ORCID: 0000-0003-3030-7591

[1]Odesa National University of Technology, Department of Grain and Feed Technology , Odesa, Ukraine
[2]Odesa National University of Technology, Departments of Biochemistry, Microbiology and Physiology of Nutrition, Odesa, Ukraine

[*]Corresponding author: Tetiana Turpurova, turpurova.tatyana@gmail.com

In order to obtain high productivity and preserve animal stock, in addition to the use of high-energy and high-protein feed, the modern introduction of agriculture requires the use of new effective and biologically safe feed additives. [1]

EnzActive, a high-performance probiotic microbial feed additive based on the yeast culture of the genus *Sacharomyces cerevisiae*, developed by Enzyme specialists and certified according to ISO 22000, FSSC 22000, GMP +, HACC standards, has recently appeared on the market of feed additives.

Active feed yeast is a probiotic product that improves digestion, accelerates the breakdown of fiber in the gastrointestinal tract and ensures the excretion of toxic metabolic products from the body.

Active feed yeastin feeding milking cows:

- in the rumen of ruminant yeast create an anaerobic environment that promotes the development of beneficial microflora;
- for the growth of yeast use rumen oxygen, which causes the growth of cellulosolytic bacteria – anaerobes;
- the activity of probiotic yeast in the rumen of ruminants reduces the formation of lactic acid, which allows you to control the level of acidity in the rumen;
- probiotic yeast produces enzymes that break down feed nutrients, including fiber;
- consistent and rapid fermentation of crude fiber increases the production of bacterial protein, increases the formation of free fatty acids - a source of energy for the body, reduces the ammonia content in the rumen.

Active feed yeast is used on farms, agricultural firms, as well as in feed mills. In the production of feed in bulk using active feed yeast, their activity will not decrease. Granulation technology has become widely used due to the numerous advantages of granular feed over bulk.

The purpose of our work was to investigate how temperature affects the activity of fodder yeast during granulation of loose compound feed.

The paper used standard methods of microbiological and physical research in accordance with state standards and ISO.

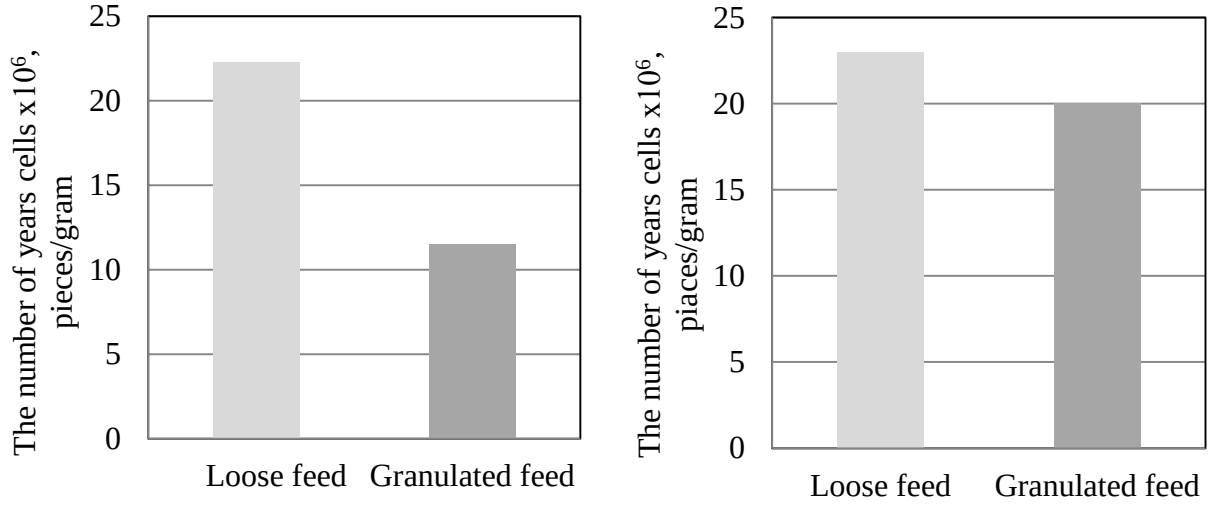
Granulation is one of the types of pressing, the essence of which is to compress an appropriately prepared loose product in a limited space for some time. Granulation is used for the purpose of forming compound feed into aggregates of particles of sizes that best meet the physiological needs of farm animals, poultry and fish.

The possibility of producing compound feed in the form of granules allows you to obtain a fixed composition according to the recipe, avoid self-sorting of components, overdose of micro-additives, selective consumption by animals of individual components of the mixture, improve their consumption, as well as mechanize and automate the distribution of feed.

Highly homogeneous compound feed of equal granulometric composition with active fodder yeast in the amount, which was determined depending on the animals for which the compound feed is produced, was granulated on a laboratory press-granulator at a temperature of 60-90 °C, a steam pressure of 0.2-0.5 MPa, consumption - 50- 80 kg/t. The resulting granules were cooled to a temperature that should not exceed the ambient temperature by more than 10 °C.

To reduce the effect of temperature during granulation on yeast, it is advisable to use encapsulation, namely the conclusion of small amounts of substances in the shell to obtain a capsule.

One of the most common molding materials for the production of capsules is gelatin. The obtained encapsulated yeast in a gelatinous shell. Gelatin is easily and quickly absorbed even in severe disorders of the gastrointestinal tract, non-toxic and shows no side effects. Ready encapsulated feed yeast is more active and stable during granulation (Fig. 1).



a b

Fig. 1 - The number of yeast cells in the feed:
a) with active feed yeast; b) with gelatin capsules of active feed yeast

In conclusions:

1. EnzActive is an innovative product, the addition of which to feed is aimed at reducing and then completely eliminating the use of antibiotics in animal nutrition.

2. It is established that the action of temperature during granulation of compound feed with active feed yeast significantly affects their activity. The number of yeast cells during granulation is reduced by almost 50%.

3. The technology of encapsulation of active feed yeast has been developed in order to create a shell that will protect the yeast from the external environment.

4. It is proved that encapsulation is one of the ways to stabilize active feed yeast, the effect of temperature during granulation of feed with gelatin capsules of active feed yeast does not significantly affect their activity. The number of yeast cells during granulation is reduced by 10%.

References:

1. Probiotic feed additives in fattening of agricultural animals. / Iegorov B. et al. // Grain Products and Mixed Fodder's. 2021.Vol. 21, Issue 4 (84). P. 25-31. DOI https://doi.org/10.15673/gpmf.v21i4.2250