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Production of vegetable protein concentrates and biologically active substances based on 3D-structuring principle

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3D – structuring - the process of three-dimensional porous materials formation - is a universal method underlying low-waste "green" biotechnologies.

Soy and pea protein concentrates, obtained based on 3D-structuring principles, surpass the existing analogues in almost all properties, including low content of anti-nutrients, which is important for their use in the production of fodders for all groups of animals including starter and pre-starter species. Proposed technology allows using simpler and cheaper equipment, reduces the amount of wastes, significantly reduces the overall and fire hazard for environment and personnel, makes it economically feasible for medium, large and even small enterprises.

The implementation of 3D-structuring technology with the production of soy protein concentrate in hydrolyzed form, characterized by the presence of highly digestible peptides and a complex of components with high biological activity, further enhances the use of these innovative feed components in rations for productive and non-productive animals and fish.

By-product of 3D-structuring technology - low-molecular biologically active substances concentrate contains oligosaccharides, isoflavonoids, and low-molecular proteins. It can serve as growth accelerator for a wide range of microorganisms. Its small addition to traditional nutrient media intensify biomass accumulation aiming at production of valuable products: the biomass itself or metabolites, which are used in feed, medical, food, polymer industries, fine chemical synthesis.

It is also of interest as a source of raw materials for obtaining valuable food and pharmaceutical products. Soy isoflavones, natural phytoestrogens, are biologically active additives, which have antioxidant, anti-inflammatory effect. Soy oligosaccharides - stachyose and raffinose, are a valuable prebiotics that accelerates the growth of useful bifidobacteria.

The use of 3D-technology in the processing of starch-containing raw materials makes it possible to dramatically increase the efficiency of such traditional enzymatic processes such as alcohol, glucose syrups, dextrins, maltodextrins and sugars production.