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Food Science for Well-being
23-26 May 2016, Kyiv, Ukraine



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The congress addressed the following topics:

FOOD EXPERTISE, SAFETY AND TECHNOLOGIES

- **Food Expertise and Safety**
- **Food Technologies**

ENERGY SYSTEMS FOR FOOD CHAIN

- **Energy Efficiency**
- **Machine Building for Food Chain**
- **Intelligent Control Systems**

NATURAL BIOACTIVE COMPOUNDS, FUNCTIONAL AND NATURAL FOOD PRODUCTS, PACKING, STORING AND PROCESSING

- **Natural Bioactive Compounds, Functional and Local Food Products**
- **Packaging, Storing and Processing**
- **Food Processing**

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YOUNG FOOD SCIENTISTS — OUR HORIZON

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UKRAINE

**ANALYSIS OF THE STRUCTURAL AND MECHANICAL
PARAMETERS OF THE CERAMIC MEMBRANES IN
THE TECHNOLOGICAL PROCESS OF MANUFACTURING**

In order to preset the technological parameters of ceramic membrane separation in the technology of dispersed environments there are need to using membranes with the necessary structural and mechanical properties. One of the high-tech methods of manufacturing such membrane is pressing powdered materials technology.

There are considering the compressing of the porous particulate material. The powder is poured into the cavity formed by the stationary die and the lower punch. The seal material is under the effect of moving down the upper punch. The planes of the upper and lower punches have the same inclination relative to the horizontal plane.

For the research simulation of the porous material densification process are used modeling method combining continuous and discrete approaches. The structural and mechanical properties of the powder material during the extrusion there are investigated on two major levels. The deformation of each of the porous particles is considered in the framework of the continuum approach. The deformation of each porous particles are examined under continual approach based on the theory of plasticity of the porous body. For solving the formulated boundary problem is used finite element method. Thus, each porous fraction is replaced by its finite element model.

The results of complex numerical experiments showed:

a) the distributions of internal porosity of the particles and the amount of accumulated plastic deformation of the base particles on the product volume of the material aren't uniform.

b) the greatest deformation of the material occurs in the products is in obtuse angles, the lowest — in sharp corners. The patterns of influence of the external forces are similar to known results concerning seals mono dispersed environments.

The installed features of the deforming particles of dispersed systems and patterns of the distribution properties can be used at the determining of parameters of the membrane's permeability.

KEY WORDS: *membranes, analysis, the structural and mechanical parameters*