JUSTIFICATION OF THE PRINCIPLE OF CONVECTIVE DRYING GRAIN WITH MICROWAVE TECHNOLOGY

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During harvest we receive grain from excessive moisture content. Wet grain is not subject to long-term storage as perishable. Timely and properly carried drying procedure not only increases the stability of grain storage, but also improves its quality, accelerate the ripening grain, grain weight equalization for moisture content (on the conditioned value) and the degree of maturity (at full maturity), improving color appearance, suspension of microorganisms and pests.

The aim - to study the principles of convective drying grain using high frequency electromagnetic field.

Materials and methods research. In terms of the properties of conductivity, grain layer is an insulator, and when it enters the field of microwave exposed to heat, the intensity of which depends on many parameters. Therefore, not only investigated the dielectric heating process, and the influence of the microwave field on change of moisture content and temperature field in zernivtsi how it will affect the intensification of drying grain plants active ventilation.

State of seed which is subjected to dielectric heating in a microwave field to describe with a system of differential equations, one of which is a core member of convective heat transfer coefficient.

Results. Grain drying the object is colloidal capillary-porous body complex structure. Drying - a complex nonlinear transient dynamic process with distributed along the length, height and width of the drying chamber parameters.

One of the conditions properly organized grain drying is required further cooling it to a temperature close to ambient temperature (not exceeding it by more than 5 0 C).

For storage at the pawn can only grain of standard quality parameters for

humidity, temperature and cleanliness.

For heating the grain layer should note two features:

a) the rate of change of the temperature of the grain layer is much smaller rate of change of temperature in one zernivtsi;

b) the rate of change of the vapor pressure inside the grains significantly greater rate of change of temperature. The intensity of microwave heating is characterized by the criterion Pomerantseva.

As a result of research the analytical expression changes in vapor pressure in the center of the grain during its microwave heating.

Upon termination of the microwave energy relaxation occurs excess vapor pressure inside the grain. In this case, the differential equation is converted to vapor transfer equation similar to equation Fourier.

Solving this equation makes it possible to get an analytical expression for the convective heat transfer coefficient.

It allows you to qualitatively assess the impact of convective heat transfer coefficient on the dynamics of microwave heating and shows that the magnitude of convective heat transfer varies in an interval.