RESEARCH ON THE EFFICIENCY OF BOILED MACHINES, USING GEOTHERMAL WATER AS THERMAL AGENT

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Abstract

The main objective of the present work is to research on increasing the efficiency of schalding machines using as additional heating, geothermal water. The schalding operation is determined by two factors: temperature and time. The variation of temperature field is 85-98 ° C, duration 1-5 min. In most cases, the schalding takes place through the treatment of the water heated to a high temperature close to ambient temperature of schalding. Construction analysis of schalding machines for modems and development trend analysis of their main directions determined allows upgrading of these machines. Primarily, this refers to the increase in the productivity of machines.

Reducing energy consumption in schalding machines (it constitutes 25% of the total consumption of energy) can be achieved using geothermal water as energy input for heating water in schalding machines. Reducing the consumption of water and steam can be obtained, using rational reuse of water schemes.

Key words: efficiency, schalding machines, geothermal water, heat energy

INTRODUCTION

Heat treatment of food constitutes an operation with deep implications in terms of technical, nutritional and sensory. Among the favorable results, including:

Inactivation of enzymes. Warms your vegetables and fruits at temperatures of 80-90 ° C, there is a rapid inactivation of enzymes in a few tens of seconds. Thermal inactivation process is explained by denaturing the proteins contained in the Constitution of enzymes and biochemical properties from loss. It was found that the thermal inactivation is subject to the laws of mono moleculare reactions (Muscă, 1984; Răşenescu, 1972).

In the process of schalding a great importance of the water quality. Insignificant losses in hard water, instead it is recommended only for those foods that have the inclination to disintegrated at high temperatures; hard water is not appropriate for the vast majority of plant products. Thus, green beans schalding in hard water loses its elasticity, strengthens and green peas.

The existence of iron in the water, leading to processes of schalding due to reaction with phenolic, particularly with caffeic acid derivatives, especially celery, cauliflower, apples, pears, quince. Iron salts and copper catalyzed vitamin C obsolescence and the phenomena of oxidation of fats, even the vegetables with a low fat content, reducing their taste (Amarfi, Brad, 1948; Ioancea, Petculescu, 1995).

Whereas deficiency, if scalding water, are much more extensive, there is a tendency to expand the schalding in the steam) (Răşenescu, 1972, 1987; Stănciulescu, 1975; Banu et all., 1998, Banu et all. 1999; Gheorghiţă, 1997).

It is necessary that the arrangements for schalding to be fixed for each product, regardless of the process applied, depending on food preservation process used. Preservation by sterilization is recommended to avoid excessive schalding, since it is not necessary to carry out a complete inactivation of enzymes, and a thermal process too hard would have a negative influence. A duration too high schalding nutrient losses intensified, causing degradation of cellular tissue, the emergence of a Pasty consistency and coating fluid disorder. In the case of preservation by freezing and drying, it is necessary to complete inactivation of enzymes to prevent degradations of enzymatic nature during storage (Muscă, 1984; Răşenescu, 1972).

The schalding operation is dependent on two factors: temperature and time.

Beach temperature is 85-98 ° C within 1-5 minutes. In most cases, the schalding is achieved by treatment of the products in water heated to a high temperature, similar to the temperature of the schalding.

The schalding products can be done using several types of machines, of which the most common are: dual schalding machines and different types of schalding machines with continuous action.

MATERIAL AND METHOD

The material chosen is a schalding machine with band.

To increase reliability of schalding machines, an extremely high importance to the regime of operation of supply conveyors which stroller schalding product through the bathroom filled with hot water or steam.

The schalding machines band is made up of schalding tunnel, bucket conveyor belt, pipeline system, and the skeleton of the installation.

The schalding consists of multiple sections, made of stainless steel, merged with each other. Along the walls of the tunnel, you inside it, is that it guides bucket conveyer rollers. The lower part of the basin represents a dip that during the operation of schalding fills with water) (Răşenescu, 1972, 1987; Stănciulescu, 1975; Banu C et all., 1998, Banu C et all. 1999; Gheorghiţă, 1997).

For heating the water in the basin plan, energy supplementation to reach temperatures in the basin at about 98° C, from geothermal water. This is brought to the heating system of the schalding machines, through pipes connected to the well drilled for geothermal water. For revision and cleaning, bath is equipped with a number of access holes, top and sides. At the midpoint, externally, is of subassembly automatic temperature setting, and two-level glass thermometers for Visual verification of the temperature of the upper and lower areas of the tunnel.

For the release of vapors that liberates, at both ends of the installation are mounted suction ducts equipped with adjusting devices.

The chosen method is simulation. Simulation method, as well as other methods of operational research, presumes the following steps:

- formulation of the problem, which, more often than not, it confuses with a formulation of the objective vague descriptions often attached to the operating conditions of the process studied; building model, which involves identifying the relationship between process parameters and defining the quantitative expression of the objective according to these parameters; validation of the model and determine possible solutions class; searching for a solution that satisfies the functional restrictions in represented mode and leading to the quality required (minimum or maximum value in a range of permissible values); solutions determined as satisfactory) (Răşenescu, 1972, 1987; Stănciulescu, 1975; Banu C et all., 1998, Banu C et all. 1999; Gheorghiţă, 1997).

RESULTS AND DISCUSSION

As a result of thermal calculation, determine the direct steam consumption, water consumption for cooling and heating surface area of schalding machines, using water as a geothermal heating. Heat consumption required for heating the product:

$$Q = m \cdot c \cdot (t_2 - t_1) \qquad (1)$$

The amount of heat consumed fresh water warming in the schalding machines

$Q_3 = W_a \cdot c_a(t_4 - t_3)$ (2)

where,

W_a- water table added

c_a- specific heat of water

t_3 și t_4- initial and final temperature of the water

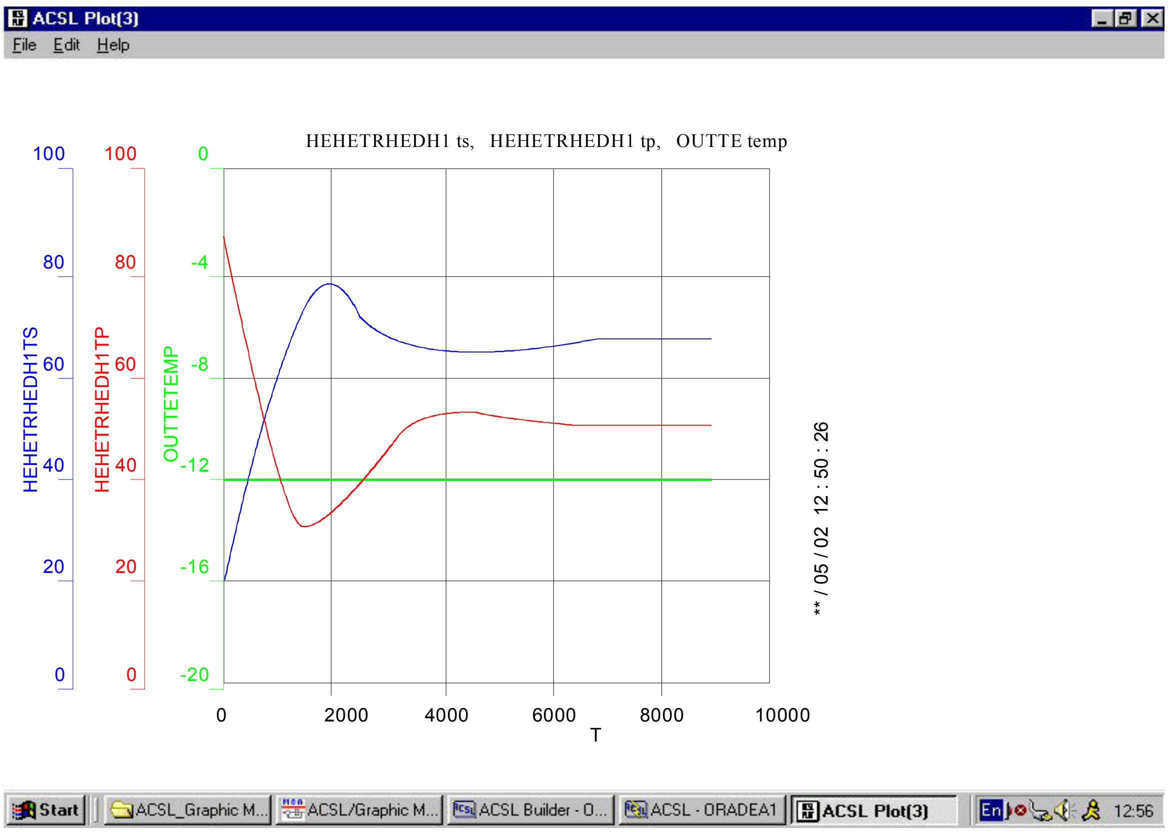

Fig. 1. Evolution of temperature water heating with geothermal water intake for schalding machines

CONCLUSIONS

After implementing the program simulating the operation of schalding machines geothermal water intake, it has made its run, in order to achieve the proposed goals. As a result of simulation operation of schalding machines geothermal water intake, taking into account various scenarios and simulation data obtained with the data resulting from the analysis of the functioning of the existing system, they have found an efficient schalding, using the proposed strateg.

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