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The collection of materials of the VII International Scientific Conference «Global Science and Innovation» is the research and practice edition which includes the researches of students, graduate students, postdoctoral students of Europe, Russia and other countries.

It is intended for students, teachers, graduate students and people who are interested in contemporary science.

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PREFACE

The Seventh International Scientific Conference «Global Science and Innovation» which was held in March 2016 is a consistent continuation of the work of Strategic Studies Institute for support and development of innovative research activity.

In this regard, it should be emphasized that modern innovative priority in social and economic, technical and engineering and organizational development of the society, aimed at solving specific problems of human welfare, resource conservation, ecological living conditions, hides deeper, more implicit, insufficient conscious and understood by science tendencies of forming social and personal ability for self-development. That is why the production of innovations and innovative activity can not be narrowed to practical new developments in different spheres of social life. More noticeable is the connection of innovations with solving of a common task of stable development of the society by purposeful organization of its most important spheres in the mode of their qualitative and interdependent updating. Namely interdependent development of major social spheres broadens their communicative abilities, provides intertranslation of the new ideas and solutions.

Scientific articles of students, Ph.D. students, doctoral candidates and scientists included in the collection of the conference " Global Science and Innovation ", are differed by novelty and detailed study of the problems of modern science development. The sections organized within the limits of the conference have been united by the necessity of scientific knowledge integration.

The collection of the articles is intended for teachers, graduate students and students of various disciplines to be used in scientific work and educational activity.

относительный радиус крышки цилиндра или поршня.

Сравнение расчетных данных, полученных с использованием уравнения (13), с экспериментальными значениями локального конвективного теплового потока [11] показало сходность в пределах 10 – 15%. Это можно признать приемлемым для практики проектирования и доводки современных дизельных двигателей.

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DEVELOPMENT OF RESOURCE-SAVING TECHNOLOGIES OF CHEESES

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Abstract

The article deals with resource-saving technologies with the improvement of the technological process, increasing output and expanding the range of hard rennet cheeses of high quality with low temperature of second heating and reduced ripening period

Key words: technology, repeated thermal processing, the cheese, thermal processing, high temperature processing.

The following material is based on the results of cheeses producing studies, their quality. Resource-saving technology production of hard rennet cheese "Bravo" production was developed

with a low temperature second heating, and a reduced ripening period.

Today for milk thermal processing in cheese production do not use high-tech equipment, that's why existing technologies do not allow to implement a process of high temperature processing to improve security and suitability for cheese production of milk that comes from private farms of Ukraine, and to provide the required physico-chemical properties of raw milk.

Our developed technology allows to use the milk which for rennet-fermentation test can be referred to the third class and unsuitable for cheese production , and to obtain products that meet the requirements of the standard to hard rennet cheeses with low temperature of second heating and reduced ripening term [1].

We conducted high-temperature processing with certain differences compared to the existing process. In the technological process of cheese production used the experimental equipment for high temperature processing of milk with steam. Operational diagram of the experimental equipment is shown in Fig. 1

For studies we used whole cow's milk of the extra, first and third classees, which were received for cheese production to Litin dairy factory in Vinnytsia region – DSTU 3662-97; table salt – DSTU 3583-97; rennet – GOST 52688-2006 H [2].

Hard rennet cheeses was investigated during production and storage of the indicators characterizing the process of ripening cheese, food and biological value of the product during production and storage. Cheese "Bravo" obtained by our developed technology on improved production equipment was examined for organoleptic, physico-chemical and microbiological indicators.

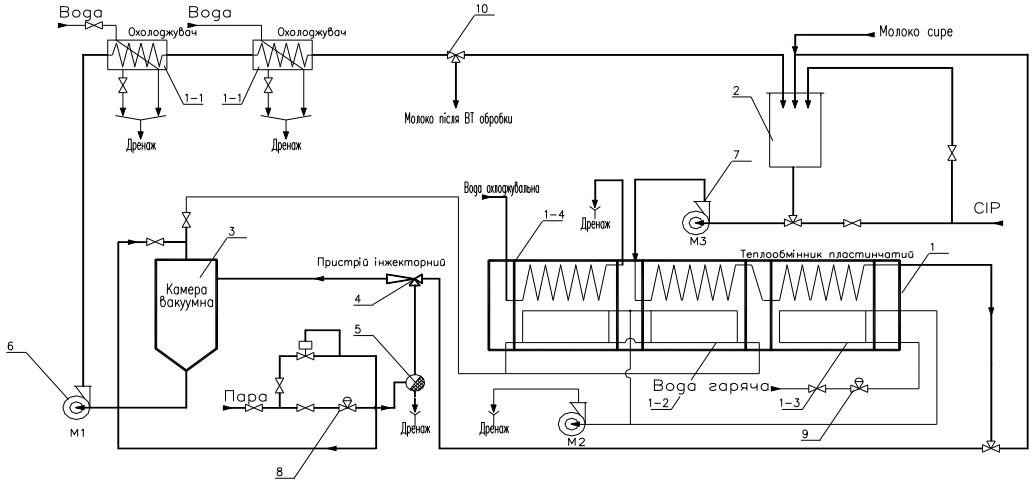

Fig. 1. Diagram of a sterilization chamber directly connected (steam contact method) heating milk by injection of steam into the milk: 1-1 – coolers; 2 – a collector of normalized milk; 1-2 – heat exchanger; 1-3 – heater; 3 – vacuum chamber; 1-4 – plate heat exchanger; 4 – injector; 5 – valve; 6 and 7 – centrifugal pump; 8 and 9 – valves; M1, M2 and M3 – milk pumps.

The results of the organoleptic evaluation of the quality of obtained cheese showed that the surface of the cheeses clean, smooth, without mechanical damage, sided disturbances, covered with a protective coating by thermospray film, firmly attached to the surface of the cheese. While conducting organoleptic studies we focused on the main criteria: taste, smell, texture, pattern, color and other organoleptic properties conditionally set the highest score [2].

Taste and odor in our cheese "Bravo" well defined, cheesy, slightly sour (39.3 points); the consistency is plastic, homogeneous - good, brittle fracture (24.0 points).

Texture of the cut has holes with round, oval or angular shape (Fig. 2) the color of the dough is homogeneous. Overall rating is 93.3 points, which corresponds to the highest grade of cheese.

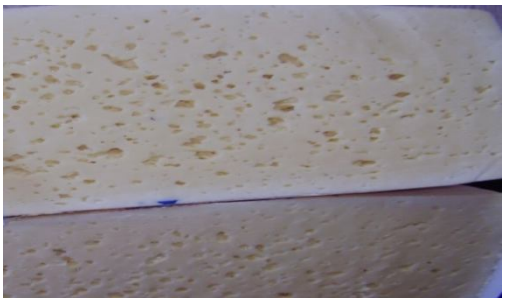

Fig. 2. Cheese "Bravo" superior grade (25 days ripening at t = 10-14 C)

The developed technology of hard rennet cheese production with a reduced ripening "Bravo" was tested and implemented in Lityn dairy plant in Vinnitsa region. Produced and sold through the trading network 12135 kg of cheese "Bravo". The results of studies of chemical, physico-chemical and microbiological parameters of cheese "Bravo" shown in table. 1, 2.

Table 1

Chemical and physico-chemical properties of rennet cheese "Bravo"

Indicator, control Method	Mass fraction, %	Control Method
Mass fraction of fat in dry substance, %	50,6	According to GOST 5867
fraction of moisture, %	47	According to GOST 3626
fraction of sodium chloride, %	1,8	According to GOST 3627
The index strength, %	60	According to GOST 7.7

Table 2

Microbiological indicators of rennet cheese "Bravo"

The indicator	Standard	Control method
Bacteria of E.Coli group (coliforms) in 0.01 g of cheese	not revealed	According to GOST 9225 or DSTU IDF 73A
Pathogenic microorganisms (including Salmonella) in 25 g of cheese	not revealed	According to DSTU IDF 93A
Staphylococcus aureus, CFU in 1 g of cheese	not revealed	According to GOST 30347, GOST 10444.2
Listeria monocytogenes, in 25 g of cheese	not revealed	According to 10.10.2.2 MB-132

These data shown that cheese "Bravo" is made from milk that for rennet-fermentation tests complies to third class, after high-temperature processing and bringing in of starter cultures of mesophilic lactic acid bacteria in amount of 1.5 % and thermophilic lactobacilli species Lb. acidophilus in amount of 0.3 % provide a high quality hard rennet cheeses [3].

Offered products comply to quality and safety regulatory documentation for hard rennet cheese "Bravo" with a low temperature second heating and a reduced ripening period.

Social effect from implementation of the developed technology allows to use raw materials from private farms with above normal content of microorganisms in milk the second and third group and get a guaranteed quality cheese with high organoleptic and microbiological indicators.

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HEAT TRANSFER TO THE TURBULENT FLOW OF HYDROCARBONS OF SUPERCRITICAL PRESSURE

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Abstract

The article presents the results of experimental studies of hydrocarbons heat transfer in a forced movement in the conditions of supercritical pressure.

Key words: critical pressure, heat transfer, Heat Exchange, heat capacity wall temperature, heat flux density.

Аннотация

Приведены некоторые результаты экспериментальных исследований теплоотдачи углеводородов при вынужденном движении в условиях сверхкритических давлений.

Ключевые слова: критическое давление, теплоотдача, теплообмен, теплоемкость, температура стенки, плотность теплового потока.

Современный этап научно-технической революции характеризуется существенной интенсификацией работы машин и аппаратов, в том числе и теплообменных устройств в различных областях энергетики и энерготехнологий. В ряде случаев, процессы теплообмена являются основными технологическими процессами, обеспечивающими функционирование сложных систем и получение материалов с заранее заданными свойствами. Стремление к повышению термического КПД и попытки избавиться от ряда явлений связанных с фазовым переходом теплоносителей от жидкости к пару, а также повышение температурного уровня работы привели к развитию аппаратов сверхкритического давления. В последние десятилетия все более широкое распространение получают установки, работающие при сверхкритических давлениях сред, используемых в качестве теплоносителей. Сюда относятся различные аппараты химической технологии, криогенные установки, энергетические и энерготехнологические котельные агрегаты сверхкритических параметров рабочей среды и т.д.

Как известно, в области параметров состояния, близких к критической точке, физические свойства тел (λ, C_p, ρ, μ) испытывают резкое и весьма своеобразное изменение, существенным образом, влияющее на ход процессов и гидравлическое сопротивление при движении теплоносителей в каналах.

Ввиду сложности процесса теплообмена в условиях резкого изменения физических свойств

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