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СУЧАСНІ ТЕНДЕНЦІЇ В ТЕХНОЛОГІЇ ПИТНОЇ ВОДИ ТА ПЕРЕРОБЦІ М'ЯСА, МОЛОКА Й МОРЕПРОДУКТІВ

THE APPLICATION OF SOUS VIDE TECHNOLOGY IN THE PRODUCTION OF MEAT PRODUCTS

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The term "Sous Vide" literally from French means "under vacuum" and involves the placement of products in food-grade plastic bag, vacuum them, and then together with the product processing in a water bath at strictly controlled temperatures. The method provides that food is cooked in a sealed environment without oxygen at temperatures below 70 °C for a long time to achieve culinary readiness.

Nowadays catering is in a state of intensive development, using technological innovations. Heat treatment of raw materials is accompanied by significant changes in the organoleptic, nutritional and biological value, as well as technological losses of mass. In this regard, a priority for the development of food production is to minimize these drawbacks by improving technology. A promising direction of improvement is the handling of raw materials at moderate temperatures prior to vacuum packing in plastic shrink-wrap, known as Sous Vide technology, which allows you to get food while maintaining weight, nutritional value increase shelf life. The aim of the project was the application of Sous Vide technology for culinary products from poultry meat and its comparison with the traditional technology of similar product [1].

Until now culinary readiness of meat products was associated with the temperature of 72 °C in the center of the product, and the temperatures of an environment higher than 85-95 °C. The main purpose of this heat treatment is the denaturation of all proteins and destruction of vegetative microorganisms. However, it is now clear that the temperature range of 70-80 °C greatly affects the number of technological indicators, in particular organoleptic properties, mass loss, and nutritional value [2].

The advantages of using the Sous Vide technology for the production of meat products following: 1) the product is produced in a sealed environment without oxygen at temperatures below 70 °C, 2) the absence of oxygen and water increase the amount of nutrients and consequently increase the nutritional value of the product, 3) through a plastic barrier significantly reduces oxidation, retains the properties of the essential polyunsaturated fatty acid lot, reduced the loss of moisture and extractives, whereby the flavors are enhanced, so less spices and salt, 4) the technology of Sous Vide allows us to get useful natural product with completely new flavor-aromatic properties and a new structure in a convenient package for long term storage [3].

The experimental part of the work was conducted in the scientific laboratories of the Department of Technology of Meat, Fish and Seafood and Department of Biochemistry, Microbiology and Physiology of nutrition ONAFT. As the object of research was selected chicken, culinary product according to the traditional technology – cooked chicken, evacuation of the product was performed in an industrial environment.

Physico-chemical parameters determined the content of moisture, salt and yield and loss after heat treatment. The results of the comparative characteristics of the indicators are given in table 1.

An important step in the research was to prove that the selected modes of heat treatment of the pattern manufactured by using the Sous Vide technology, provide adequate microbiological safety and duration of storage of finished products. In table 2 shows the results

of microbiological research of samples manufactured by two technologies, which were stored at a temperature of 2-4 °C during 6 days.

Table 1 – Comparative characteristics of physico-chemical properties of the samples made according to the traditional technology and the technology of Sous Vide

The name of the index	The sample made according to the technology		The value of the index according to Govermment standart 4531:2006
	traditional	Sous Vide	
Mass fraction of moisture, %	66.3	74.9	not normalized
Mass fraction of sodium chloride, %	0.6	0.8	1.2
Yield, %	74.2	93.4	not normalized
Loss, %	25.7	6.5	not normalized

Table 2 – Microbiological properties of the samples, which were stored at t=2-4 °C

The amount of mesophile and optional-anaerobic microorganisms, colony-generating iteames in 1 g. of the product									
Raw meat			The sample made according to the technology						Standart
			traditional			Sous Vide			
Storage period, days									
0	1	6	0	1	6	0	1	6	
210×10^3	240×10^3	–	Not allowed	0.66×10^3	1.2×10^3	Not alowed	0.61×10^3	0.37×10^3	$<1\times10^3$

Sensory characteristics of chicken which was made by the technology Sous Vide greatly surpassed them in comparison with the sample which was made by traditional technology. Namely, the meat was juicier, tender, and solid on the cut, taste was expressed more brightly. The output of chicken fillet which was made by Sous Vide technology increased by 19 % in comparison with the sample which was manufactured by the conventional technology, also the product loss decreased in 4 times. Microbiological studies have proved microbiological trustworthiness chicken, made by a technologist Sous Vide on the 6th day of storage compared to the sample made according to traditional technology, the shelf life which is according to Govermment standart 4531:2006 – not more than 1 day.

So, the technology of Sous Vide allows you to get natural (no additives or preservatives) culinary products from poultry meat of high nutritional value, with improved organoleptic properties safe for the consumer during storage for 6 days. This technology is promising for domestic manufacturers of meat products, because gives you the opportunity to expand the range, to provide high yield and extend the shelf life of the finished product.

Scientific Supervisors – PhD Soletska A., PhD Egorova A.

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WATER FROM THE AIR – AN ADDITIONAL SOURCE OF WATER FOR THE POPULATION

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The deficit of fresh water exists in many countries. Therefore, the search for additional sources of drinking water is important. This is especially true for areas where there is no centralized water supply and quality of water available for use underground or surface sources is low and requires complex and costly water purification technology. For a number of districts of Odessa region of Ukraine specified conditions are common. The deficit of fresh water experience recreation and health centres located along the Black Sea coast, estuaries and lakes. Water is carried through the packed water (for drinking purposes) and imported in tanks of water (for drinking and household needs). The situation with fresh water is the cause of the rising cost of services for tourists. One possible way to partially solve this problem is to use water obtained from atmospheric air (Osadchyk, Titlov, 2013). In 1 m^3 of air contains from 4 to 25 grams of water vapour. Getting water from the air is possible by cooling to a temperature below the temperature "dew point". In order to get the water from the air, it is necessary that its relative humidity was 40 % and the temperature was higher than 15.5 °C. These requirements correspond to the climatic conditions of the holiday season in Odesa region.

For water with air today use different modifications. There are wind turbines standalone type, which generate electricity and water (technology Eole Water "Wind turbine makes 1,000 liters of clean water a day in the desert Megan Treacy" /Technology/ Wind Technology April 16, 2012). There are billboards with a combined surface with hydrophilic and hydrophobic materials (technology Org billboard "Lima billboard is tapped for drinking water"/ 25 February 2013, by Nancy Owano), "bearing tree" (technology Warka Water "Architecture and Vision, Kickstarter"/ Warka water promises to harness safe drinking water from the air / Adam Williams January 23, 2015) or mesh panels hydroscopic materials. The offices to obtain water from the air using air driers (NBD Nano Technology Startup "This self-filling water bottle mimics a desert beetle" / by liat clark, wired uk /wired.co.uk/11.26.12.).

This process occurs in household air conditioners, which are widely used for cooling indoor air sanatoriums and recreation in the holiday season. During their operation formed secondary product – water. It is, in most cases, are not collected and not used in any way, although considerable quantities. Each air conditioners such models "SenSey" FTI-51MR, placed in the environment of 10 to 15 liters of fresh water per day. If, for example, at the recreation center operated 70 such air conditioners, over the holiday season (May to October) they produce about 180 000 liters of water. This water can be used for drinking and household needs (Kovalenko, Kormosh, 2015).

Of course, the use of air conditioner condensate without treatment for drinking purposes is impossible. After all, its quality depends on many factors, including the contamination and humidity, design, work environment and location of the air conditioner, and other

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