МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ

ОДЕСЬКИЙ НАЦІОНАЛЬНИЙ ТЕХНОЛОГІЧНИЙ УНІВЕРСИТЕТ

ЗБІРНИК ТЕЗ ДОПОВІДЕЙ

82 НАУКОВОЇ КОНФЕРЕНЦІЇ ВИКЛАДАЧІВ УНІВЕРСИТЕТУ

Одеса 2022

Наукове видання

Збірник тез доповідей 82 наукової конференції викладачів університету
26 – 29 квітня 2022 р.

Матеріали, занесені до збірника, друкуються за авторськими оригіналами.
За достовірність інформації відповідає автор публікації.

Рекомендовано до друку та розповсюдження в мережі Internet Вченою радою
Одеського національного технологічного університету,
протокол № 13 від 24.05.2022 р.

Під загальною редакцією Заслуженого діяча науки і техніки України,
Лауреата Державної премії України в галузі науки і техніки,
д-ра техн. наук, професора Б.В. Єгорова

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BLU-RAY STERILIZATION TECHNOLOGY IS A MODERN WAY TO EXTEND THE SHELF LIFE OF SOUS VIDE FOOD FOR THE CATERING INDUSTRY

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In the past 20 years, studies on SV cover various research interests, such as food safety [0], storage time [0; 0], quality improvement [0; 0], effects on nutrients [0], nutritional bioavailability [0], and various other technical approaches [0].

SV's challenges are enriching the flavor of SV food and improving the appearance color of SV animal-derived food to replace traditional cooking methods. The future trend is from restaurants to food factories, adopting SV technology at all levels of catering services and industrializing and standardizing it.

Heat sterilization technology has been used in the food industry for many years to ensure food safety, extend shelf life, and maintain food quality. However, heat sterilization technology could also harm the quality of the food. The high temperature during the sterilization process may change the food's color, flavor, and nutrient loss. Non-thermal disinfection technology to minimize the loss of various nutrients in food, try to maintain the original flavor of food and improve the economy of disinfection technology, convenience, improve food packaging and storage conditions, extend the shelf life of food to meet the needs of the growing material life of consumers.

Light sterilization is a non-pharmacological technology, including photodynamic therapy (PDT) and ultraviolet radiation (UVC), and has been widely studied as an alternative to traditional antibiotics [0]. The advantage of light sterilization is that the killing effect is the same regardless of the bacteria's antibiotic resistance. Blu-ray (Blu-ray) sterilization technology selects Blu-ray for light sterilization, and its wavelength is 405-470 nm. Blu-ray can sense by Gram-positive bacteria, Gram-negative bacteria, and fungi and induce Blu-ray receptors to cause physiological reactions. It has potential antibacterial or bactericidal ability without photosensitizers. Also, Blu-ray is less harmful to mammalian cells [0]. The mechanism of Blu-ray sterilization is cell death induced by oxidative stress caused by reactive oxygen species (ROS) generated by the endogenous photosensitizers of bacteria after absorbing Blu-ray. Photosensitizers in the ground state are converted to their single or trilinear states upon irradiation with Blu-ray, in the presence of oxygen, undergoing two types of energy transfer: type I that produces toxic oxygen species, such as hydrogen peroxide (H_2O_2), superoxide, or hydroxyl radicals; (2) type II that generates $^1O_2$ [0].

Because of the effectiveness of Blu-ray sterilization and the absence of any thermal effect, scholars noticed it in the food field. Dos Anjos [0] et al. showed that after Blu-ray irradiation (413 nm, <2 h, 720 J/cm^2), all *Staphylococcus aureus, Escherichia coli, Pseudomonas aeruginosa, Salmonella Typhimurium*, and *Mycobacterium fortuitum* presented a 5 log inactivation in milk. Blu-ray irradiation (460 nm, 4°C, irradiance 92 mW/cm^2) reduced *Salmonella* in orange juice by 3.3 lg CFU/mL, and the same irradiance reduced *Salmonella* by 3.6 lg CFU/mL when the sterilization temperature was increased to 12°C. At the same time, *Salmonella* achieved a reduction of 4.8 lg CFU/mL when the temperature was increased to 20°C [0]. Blu-ray sterilization is still effective for solid foods. It was found that Blu-ray irradiation (460 nm) can sterilize fresh-cut fruits without any food additives, and Blu-ray irradiation (irradiance 92, 147.7, and 254.7 mW/cm^2) when used at ambient temperatures of 7°C and 16°C, can inhibit Salmonella spp. inoculated on the surface of fresh-cut pineapples [0]. Josewin et al. [0] used Blu-ray (460 nm) in combination with riboflavin (25, 50, and 100 μM) for sterilization and found that Blu-ray at a dose of 2.4 kJ/cm^2 reduced Listeria monocytogenes on the surface of smoked salmon by 0.7-1.2 lg CFU/cm^2 at 4°C and 12°C.

Thus, it can be seen that the Blu-ray non-thermal sterilization technology in the food field is a relatively wide range of applications.

This new cooking technique began to be introduced to the United States, the United Kingdom, and Canada and used by some of the world's top restaurants. At the beginning of the 21st century, Michelin-starred restaurants used SV technology in the kitchens. Therefore, the study of the influence of the Blu-ray non-thermal sterilization technology on extending the shelf life and quality indicators of Sous Vide food is relevant.

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ANATOMICAL AND HISTOLOGICAL DIFFERENCES BETWEEN MEAT AND GREASY BREEDS OF PIGS

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Pigs were first domesticated in China and Southeast Asia about 9 thousand years ago. However, from then until almost the 18th century, domesticated pigs differed little from wild ones, and only after the pigs began to be directed to select for certain characteristics, separate breeds began to appear.

Today, the selection and crossbreeding of pigs has become an important industry in the agricultural and food industries.

According to the exterior and interior features, it is possible to determine the direction of productivity (body type) of pigs. The productivity of pigs is divided by fatness and an important criterion is the percentage of fat in the carcass. Pig breeds are classified into 4 types: meat, bacon, greasy and universal (meat) type.

Different breeds of pigs, hybrid features, directions of productivity are closely related to the anatomical features of animals. After comparative characteristics, it was found that with the same number of vertebrae in the cervical spine (7 vertebrae), in the thoracic region of pigs there can be from 14 to 17 vertebrae and the same number of pairs of ribs, in the lumbar region from 5 to 7 vertebrae. As the number of ribs increases, the number of lumbar vertebrae decreases. Selection of pigs for carcass length probably increased the average number of vertebrae in the selected lines. The number of vertebrae in the thoracic and lumbar regions determines the length of the carcass, meat-fat qualities and the resistance of pigs to external factors and diseases.

The degree of fatness of pigs is determined by the slaughter yield, the length of the carcass, the thickness of the fat, the size of the "muscle eye", the mass and density of the ham, the content of meat and fat in the carcass.

Meat, or bacon, pigs are distinguished by an elongated body (some breeds, such as Landrace, have an increased number of vertebrae), a small head, and the front part is smaller than the back. Muscle tissue grows intensively, and fat deposition is slowed down. This feature makes the cultivation of meat breed pigs more profitable for farmers, since less costs are required per unit of mass. Animal carcasses after slaughter with a weight of 100 kg contain 56–62 % of meat and only 28–32 % of fat. Hind legs and sacrum especially distinguishes pigs of meat breed from greasy. In meat breeds, the sacrum should be powerful, and the ham should be fleshy. The sides of meat pigs are rounded and elastic. Some meat pigs are genetically predisposed to the accumulation of

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