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Impact of cold storage on the Nutritional and Sensory Quality of *Pleurotus florida*

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Abstract:

In this article described about cold storage is beneficial for extending the shelf life and maintaining the nutritional and sensory quality of *Pleurotus florida* mushrooms, but the duration of storage should be monitored to avoid significant quality degradation. Cold storage has a profound impact on the nutritional and sensory quality of *Pleurotus florida*. By maintaining low temperatures, it is possible to preserve the mushrooms' macronutrients, vitamins, minerals, texture, flavor, and appearance while also enhancing their microbiological safety. However, the duration of cold storage should be carefully monitored to avoid significant quality degradation over time. Proper cold storage practices can ensure that *Pleurotus florida* mushrooms remain a nutritious and appealing food product for consumers.

Keywords: Nutritional, *Pleurotus florida*, Cold storage, microbiological safety.

I. Introduction

The preservation of food quality during storage is a critical aspect of post-harvest handling, especially for perishable items like mushrooms. *Pleurotus florida*, commonly known as the Florida oyster mushroom, is highly valued for its nutritional benefits and sensory qualities. This review examines the impact of cold storage on the nutritional and sensory quality of *Pleurotus florida*, focusing on how different storage conditions can affect its overall quality.

Impact of cold Storage

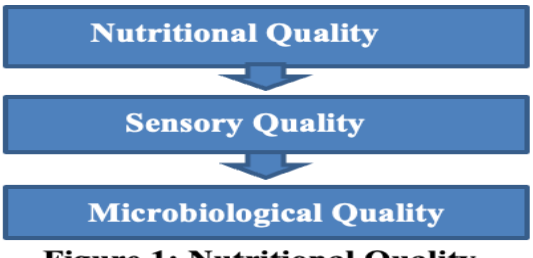

Figure 1: Nutritional Quality

II. Macronutrients and Micronutrients

Cold storage is known to significantly influence the macronutrient composition of *Pleurotus florida*. Proteins, carbohydrates, and fats are relatively stable during short-term storage at low temperatures (around 4°C). However, prolonged storage can lead to the degradation of these nutrients due to enzymatic activities and microbial growth.

1. **Proteins**: The protein content in mushrooms is generally preserved well under cold storage. The activity of proteolytic enzymes is reduced at low temperatures, preventing significant protein breakdown.
2. **Carbohydrates**: Cold storage helps in maintaining the carbohydrate levels by

slowing down the enzymatic conversion processes that can lead to sugar depletion. This is crucial for maintaining the energy content of the mushrooms.

3. **Fats**: The low-fat content in mushrooms is non significantly affected by cold storage, because lipid oxidation processes are minimal at low temperatures.

III. Vitamins and Minerals

Cold storage has a positive impact on the retention of vitamins and minerals in *Pleurotus florida*. Vitamins such as B-complex vitamins (thiamine, riboflavin, niacin) and minerals like potassium, phosphorus, and selenium are well-preserved during cold storage.

1. **Vitamins**: B-complex vitamins are sensitive to temperature changes, and their stability is better maintained at low temperatures. Cold storage helps in retaining these vitamins, which are crucial for metabolic activities.
2. **Minerals**: The mineral content remains relatively stable under cold storage. Potassium, phosphorus, and selenium levels do not show significant changes during the storage period, ensuring that the nutritional benefits of the mushrooms are preserved.

IV. Sensory Quality

Texture

The texture of *Pleurotus florida* is an important sensory attribute that can be significantly affected by cold storage. Mushrooms stored at 4°C maintain a firm texture compared to those stored at higher temperatures.

- **Firmness**: Cold storage helps in maintaining the firmness of the mushrooms by reducing the enzymatic activities that cause softening. This is essential for maintaining the desirable chewy texture of the mushrooms.
- **Moisture Content**: Moisture loss is a critical factor that affects texture. Cold storage helps in retaining the moisture content, thereby preventing shrinkage and dehydration of the mushrooms.

Flavor

Flavor is another crucial sensory attribute influenced by cold storage. The flavor of mushrooms is primarily derived from their volatile compounds, which can be affected by storage conditions.

1. **Aroma Compounds**: The aroma compounds in *Pleurotus florida*, such as 1-octen-3-ol, are better preserved under cold storage. This helps in maintaining the characteristic of mushroom flavor during storage.
2. **Taste**: The taste, influenced by the levels of free amino acids and sugars, remains relatively stable during cold storage. This ensures that the mushrooms retain their umami taste and overall palatability.

Appearance

The appearance of mushrooms, including color and overall visual appeal, is a key factor in consumer acceptance.

1. **Color**: Cold storage helps in maintaining the natural color of *Pleurotus florida* by reducing enzymatic browning reactions. This is important for maintaining the visual appeal of the mushrooms.
2. **Surface Quality**: The surface quality, including the absence of visible microbial growth and spoilage, is better maintained under cold storage conditions. This helps in extending the shelf life of the mushrooms.

V. Microbiological Safety

Cold storage plays a vital role in enhancing the microbiological safety of *Pleurotus florida* by inhibiting the growth of spoilage microorganisms and pathogens.

1. **Microbial Load**: The overall microbial load, including bacteria and fungi, is significantly reduced under cold storage. This helps in preventing spoilage and extending the shelf life of the mushrooms.
2. **Pathogens**: Cold storage conditions are effective in inhibiting the growth of common foodborne pathogens such as Salmonella and Listeria monocytogenes, thereby ensuring the safety of the mushrooms.

VI. Conclusion

This article explain all about the cold storage has a profound impact on the nutritional and sensory quality of *Pleurotus florida*. By maintaining low temperatures, it is possible to preserve the mushrooms' macronutrients, vitamins, minerals, texture, flavor, and appearance which also enhancing their microbiological safety. However, the duration of cold storage should be carefully monitored to avoid significant quality degradation over the time.

Proper cold storage practices can ensure that *Pleurotus florida* mushrooms remain a nutritious and appealing food product for consumers and studies about the impact of cold storage on the nutritional and sensory quality of *Pleurotus florida* mushrooms has been studied to understand how storage conditions affect their properties.

1. **Nutritional Quality**: Cold storage at low temperatures help in maintaining the nutritional value of mushrooms by slowing down metabolic processes and enzymatic activities that can lead to nutrient degradation. It has been found that storing mushrooms at temperatures around 4°C can help in preserving their protein, fiber, vitamin, and mineral content for a certain period without significant loss.
2. **Sensory Quality**: The sensory quality, including attributes like texture, flavor, and appearance, can be well-preserved under cold storage conditions. However, prolonged storage can lead to some sensory deterioration. For example, mushrooms stored at 4°C maintain good quality for about a week, but beyond that, there might be noticeable changes in texture and flavor due to moisture loss and microbial growth.
3. **Microbiological Safety**: Cold storage helps in reducing the growth rate of spoilage microorganisms and potential pathogens. Studies have shown that the microbiological quality of mushrooms remains high at the point of purchase and after being stored at 4°C for up to 12 days. This storage condition is effective in minimizing the presence of harmful bacteria such as *Salmonella sp*. and *Listeria monocytogenes*.

References

1. Kortei, N.K., Odamtten, G.T., Obodai, M., & Wiafe-Kwagyan, M. (2017a). Nutritional qualities and shelf life extension of gamma-irradiated dried *Pleurotus ostreatus* preserved in two different storage packs. *Food Science and Technology, 5*(1), 9-16.
2. Kortei, N.K., Odamtten, G.T., Obodai, M., Appiah, V., & Akonor, P.T. (2015). Determination of color parameters of gamma-irradiated fresh and dried mushrooms during storage. *Croatian Journal of Food Technology, Biotechnology and Nutrition, 10*(1-2), 66-71.
3. Kortei, N.K., Odamtten, G.T., Obodai, M., Wiafe-Kwagyan, M., & Addo, E.A. (2017b). Influence of low dose of gamma radiation and storage on some vitamins and mineral elements of dried oyster mushrooms (*Pleurotus ostreatus*). *Food Science and Nutrition, 5*, 570-578.
4. Li, D., Qin, X., Tian, P., & Wang, J. (2016). Toughening and its association with the postharvest quality of king oyster mushroom (*Pleurotus eryngii*) stored at low temperature. *Food Chemistry, 196*, 1092-1100.

5. Li, R., Zheng, Q., Lu, J., Zou, Y., Lin, J., Guo, L., Ye, S., & Xing, Z. (2021). Chemical composition and deterioration mechanism of *Pleurotus tuoliensis* during postharvest storage. *Food Chemistry, 338*, 127731.
6. Li, X., Feng, T., Zhou, F., Zhou, S., Liu, Y., Li, W., Ye, R., & Yang, Y. (2015a). Effects of drying methods on the tasty compounds of *Pleurotus eryngii*. *Food Chemistry, 166*, 358-364.
7. Lin, X., Xu, J.L., & Sun, D.W. (2019). Investigation of moisture content uniformity of microwave-vacuum dried mushroom (*Agaricus bisporus*) by NIR hyperspectral imaging. *LWT-Food Science and Technology, 109*, 108-117.
8. Lüle, F. (2014). Comparison of different drying methods on the collected çaşır mushrooms (*Pleurotus eryngii)* in Malatya-Arguvan region. PhD Thesis, Namık Kemal University, Tekirdağ, Turkey.
9. Manzi, I., Aguzzi, A., & Pizzoferrato, L. (2015). Nutritional quality and ascorbic acid retention of mushrooms (*Agaricus bisporus*) stored at 4°C. *Journal of Agricultural and Food Chemistry, 63*(15), 3976-3982.
10. Meier, N., Tichy, A., Wagner, M., & Ludewig, M. (2021). Microbiological Safety and Sensory Quality of Cultivated Mushrooms (*Pleurotus eryngii, Pleurotus ostreatus* and *Lentinula edodes*) at Retail Level and Post-Retail Storage. *Foods, 10*(4), 816.
11. Meier, N., Tichy, A., Wagner, M., & Ludewig, M. (2021). Microbiological Safety and Sensory Quality of Cultivated Mushrooms (*Pleurotus eryngii, Pleurotus ostreatus* and *Lentinula edodes*) at Retail Level and Post-Retail Storage. *Foods, 10*(4), 816.
12. Senik, A.L., Musa, M.H., & Kamaruddin, K. (2017). Effect of storage temperature on the postharvest quality of *Pleurotus ostreatus*. *International Journal of Food Science and Technology, 52*(4), 1500-1507.

    Wang, Y., & Zhang, Y. (2019). Preservation techniques for edible mushrooms: A review. *Food Science and Biotechnology, 28*(3), 761-771.