



Effects of Canning on Button Mushroom

Kavita Arora¹, P. P. Upadhyaya¹, Anil K. Dwivedi^{1*} and Ved Ratan²

¹ Department of Botany, D.D.U. Gorakhpur University, Gorakhpur, (U.P.), INDIA

² Chandra Shekhar Azad University of Agriculture and Technology, Kanpur, (U.P.), INDIA

* Correspondance: E-mail: anil.k.dwivedi@gmail.com

(Received 15 Jan, 2016; Accepted 25 Jan, 2016; Published 28 Jan, 2016)

ABSTRACT: Canning is a technique by which the mushrooms can be stored for a longer period, up to about one year and most of the international trade in mushrooms is done in this form. The effects of canning on the chemical composition of edible mushrooms (*Agaricus bisporus*,) were investigated. Samples were analyzed for proximate constituents (moisture, fat, crude protein, ash, and carbohydrates) at different time period (Fresh and after 4, 8, 12 months). It was found that value of carbohydrate, fat, protein and ash content decreases gradually but the moisture content increases consequently; though it is the best method of preservation, as mushroom was available in more or less natural form and important for those places where mushrooms are less cultivated. The quality of canned mushroom shows slight retardation in its nutrient content but it is a relevant method to store the mushroom for longer period.

Keywords: Mushrooms; preservation; canning and chemical composition.

INTRODUCTION: Button mushroom contributes more than 85 % of the total mushroom production (Arora et al., 2013a, Arora and Upadhyaya, 2014). Owing to its attractive taste, aroma and nutritional values, mushrooms are valuable components of the diet (Brodziak and Majchrzak 1984, Manzi et al., 1999, Mattila et al., 2001, Karmanska et al., 2002, Czapski 2003, Vetter 2003). The increased production of mushroom demands proper processing to increase shelf life and marketability. Since mushrooms are highly perishable and get spoiled due to wilting, veil opening browning, liquefaction, loss of texture, aroma, flavor etc, making it unsaleable (Azad et al., 1987). Button mushroom being high in moisture and delicate in texture, cannot be stored for more than 24 hours at the ambient conditions prevailing in the tropics. The consumption of mushrooms throughout the year, particularly of species harvested in natural habitats, is made possible through the use of appropriate processing methods (Arora, et al., 2013b). The proper quality of mushroom products can be obtained by eliminating or inhibiting adverse changes in the colour and texture of mushroom (Czapski and Szudyga 2000).

Long-term preservation methods such as canning can make the availability of mushroom of good quality throughout the year. In order to produce good quality canned mushrooms, these should be processed as soon as possible after the harvest (Arora et al., 2013c). White button mushrooms are canned whole, sliced, or smaller pieces. Dang et al., (1978) conducted experi-

ment on the influence of pre treatment on the yield and quality of canned mushrooms and reported soaking of mushrooms in water before blanching, and the combination of soaking and storage have proved useful in reducing the shrinkage losses, thereby increasing the canned product yield. Dang and Singh (1978) reported ascorbic acid, EDTA, sulphur dioxide and citric acid as useful adjunct in canning of mushroom for improving the colour of canned mushroom. Dehydro-canning refers to canning of partially dehydrated product. This method of preservation includes dehydration to a point where product quality is not damaged (Lazor, 1978). Coskuner and Ozdemir (2000) explored the possibilities of using EDTA as browning inhibitor as well as to control spoilage during storage and canning operations.

Proposed work is based on the theme to find out the nutritional status in canned edible mushrooms, when kept for about one year.

MATERIALS AND METHODS: Fresh samples of Button mushroom (*A. bisporous*) were collected from the Department of Plant Pathology, Chandra Shekhar Azad university of Agriculture and Technology, Kanpur. For canning samples undergo following steps like sorting, washing with tap water, trimming, chemical washing with 0.4% KMS (Potassium meta bisulphite) solution, blanching in 2% sodium chloride solution and then filling into cans containing 4% Brine 0.1% citric acid. Then after sterilization at 115°C for 30

min, it is stored in cool and dry Place, as recommended by Arora (2014).

RESULTS AND DISCUSSION: The results of change in nutrient content, after 4 months, 8 months and 12 months of canning of mushroom samples are expressed in the table 1 and graphical representation of the same is expressed in the figure 1. The obtained values were subjected to standard deviation, which shows the values to be within the limit of 5%.

Fresh and the preserved Button mushrooms were analyzed for the moisture content. It was observed that value in the canned mushrooms decreased, this may be due to the fact of the presence of NaCl as preservative, which acts as a desiccant.

Table 1: Biochemical analysis of canned button mushroom.

Month/ Nutrients	Fresh	4 Months	8 Months	12 Months
Carbohydrate	47.6	38.8	37.1	37.0
Protein	35.2	27.6	26.2	25.9
Fat	2.1	1.6	1.4	1.4
Ash	11.4	5.9	4.8	4.5
Moisture	12.3	13.4	13.6	14.7

The average protein content of the fresh Button was 35.2. In case of canned mushrooms the protein decreases gradually. Fat content of fresh button mushroom is 2.1, which gradually decreased in canned during storage. The decrease in the fat content may be due to the fact of hydrolysis of fats.

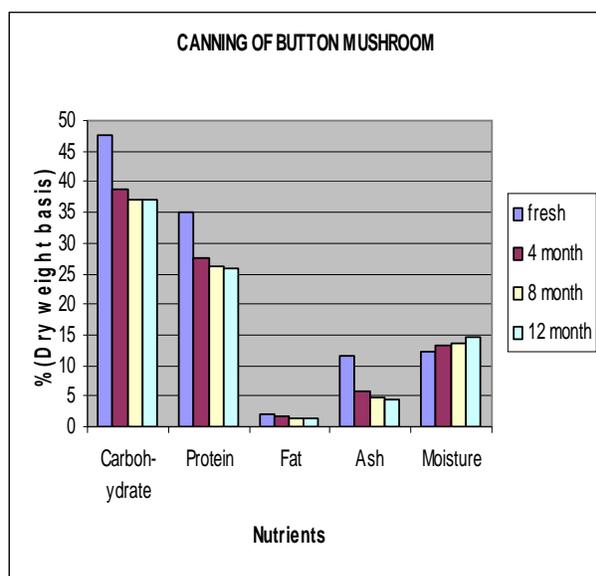


Figure 1: Graph of Canning of Button Mushroom.

CONCLUSION: During storage period it was recorded that value of carbohydrate, fat, protein and ash content decreases gradually but the moisture content increases consequently. Though it is the best method of preservation, as mushroom was available in more or less natural form and important for those places where mushrooms are hardly available. The quality of canned mushroom shows slight retardation in its nutrient content but it is a relevant method to store the mushroom for as long as about one year.

REFERENCES:

1. Arora. K. (2014) *Processing Effect on Nutritive Value of Commercially Grown Edible Mushrooms in India*, DDU Gorakhpur University, Gorakhpur (Ph.D. Thesis).
2. Arora, K., Upadhyaya, P. P. and Dwivedi, A. K. (2013a) Popular mushrooms in Uttar Pradesh, *International J. of Research in Engineering and Bioscience*, 1(1), 11-16.
3. Arora, K., Upadhyaya, P. P., Ratan, V. and Dwivedi, A.K. (2013b) Is freezing an effective preservation for button mushroom?, *Modern J. Life Sciences*, 12(1-2), 87-92.
4. Arora. K., Upadhyaya, P. P. (2014) Edible Mushroom: A Boon of Biodiversity, In: *Anthropocology and Applied Biodiversity* (Ed. A.K. Dwivedi), Lambert Academic Publisher (LAP), Germany: 279-292.
5. Arora, K., Upadhyaya, P. P., Sharma, T. (2013c) Effect of washing on Button Mushroom (*Agaricus bisporus*), In: *Transdisciplinary Environmental Issues* (Ed. A.K. Dwivedi), Lambert Academic Publisher (LAP), Germany, 89-98.
6. Azad, K. C., M. P. Srivastava, R. C. Singh and P. C. Sharma (1987) Commercial preservation of mushrooms - 1. A technical profile of canning and its economics, *Indian Journal of Mushrooms*, XII-XIII: 21-29.
7. Brodziak, L., Majchrzak, R. (1984) Shiitake, goodness to comparison with others mushroom species. *Rocz., PZH*, 35 (1), 59-62.
8. Coskuner, Y. and Ozdemir, Y. (2000) Acid and EDTA blanching effects on the essential element content of mushrooms (*A. bisporus* L.), *J. Sci. Fd. Agric.*, 80(14), 2074-2076
9. Czapski J., Szudyga K., (2000) Frozen mushrooms quality as affected by strain, flush, treatment before freezing, and time of storage, *J. Food Sci.*, 65 (4), 722-725.
10. Czapski, J., (2003) Evaluation of chemical composition of commercially canned mushrooms processed from fresh and desalted mushrooms and derived from different geographic regions, *Veg. Crops Res. Bull.*, 58, 135-141.

11. Dang, R. L. and Singh, R. P. (1978) Preservation of Mushrooms, *Indian Mushroom Sci.*, 1, 215-23.
12. Dang, R. L., Singh, R. P. and Gupta, A. K. (1978) Influence of pre treatment on yield and quality of canned mushrooms. Technologists, CFTRI, Mysore, June 23-25.
13. Karmanska A., Wędzisz A., Biernat, J., J. Florczak, (2002) Comparison of the chemical composition of ammonia lateral oyster - *Pleurotus ostreatus* (Jacq. ex Fr.) Quel) with champignons dwuzarodnikową *Agaricus bisporus* (Lge.) Sing) (A comparison of the chemical contents of oyster fungus *Pleurotus ostreatus* (Jacq. ex Fr.) And field mushroom *Agaricus bisporus* (Lge.) Sing)), *Bromatol. Chem. Toksykol.*, 35(3), 283-287.
14. Lazor, M. E. (1978) Dehydro freezing of fruits and vegetables. In: Dehydro freezing preservation of foods ed: Donald, K. T., Wallace, B., Van, Arsdel, B.S. and Copley, B. J. AVI Publi. Co. Inc. Westport, 347-376.
15. P. Manzi, L. Gambelli, S. Marconi, V. Vivanti, Pizzoferrato L., (1999) Nutrients in edible mushrooms: an inter-species comparative study, *Food Chem.*, 65(4), 477-482.
16. P. Mattila, K. Konko, Euroola M., Pihlava J.-M., J. Astola, Vahteristo L., Hietaniemi V., Kumpulainen J., Valtonen M., Piironen V., (2001) Contents of vitamins, mineral elements, and some Phenolic compounds in cultivated mushrooms, *J. Agric. Food Chem.*, 49 (5), 2343-2348.
17. Vetter, J., (2003) Chemical composition of fresh and conserved mushroom, *Eur. Food Res. Technol.*, 217 (1), 10-12.