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STUDY ON NUTRITIONAL CHANGES IN PRESERVED FOODS

Turc Laura, Adamov Tabita, Pîrvulescu Luminița*

*Banat´s University of Agricultural Sciences and Veterinary Medicine "King Michael I of Romania" from Timisoara, Faculty of Management and Rural Tourism, 119, Calea Aradului, Timisoara, Romania
*Corresponding author's e-mail: luminita_pirvulescu@usab-tm.ro

Abstract

To ensure the physiological requirements, human nutrition must include a sufficient amount of different macronutrients (proteins, lipids, carbohydrates) and micronutrients (vitamins, minerals). The nutritional value of a food is given by existing biochemical compounds, and the use of products and processing of raw materials in the food industry aim to maintain quality characteristics.

Certain preservation methods can change the nutrient content to a greater or lesser extent. The present study studies the modification of the vitamin content in several vegetable products preserved by different methods.

Key words: vitamins, food, preservation, sterilization, freezing

INTRODUCTION

Food is an essential factor for humans, providing energy and basic substances for the development of metabolic processes, representing the regulator of exchange processes between the human body and the environment. The imbalance between intake and nutritional needs causes profound changes, especially since the human body is in high demand and exposed to stressors. Food deficiency of basic nutrients has a negative effect on human health and activity, reducing the ability to work, resistance to disease and stressors, amplifying some metabolic disorders. [4, 5, 6, 12, 16]

The food product consists of a complex by organic and inorganic substances necessary for the human body. Present every day in all stages of the development of the human personality, the food product occupies a primordial place among the factors of human life, fulfilling specific functions, which have their origin in the value of use (consumption) itself, being a manifestation of it. [7, 10, 13, 15]

Vitamins are organic substances with a functional role that cannot be synthesized by the body, but whose presence in the human body is absolutely obligatory for the achievement of some of its essential functions. Vitamins are regulators, which do not have energy properties, but they are very important for normal metabolism. The presence of vitamins is essential for the normal development of metabolic processes, therefore vitamins are

considered biostimulators and they are included in the group of active substances, such as enzymes and hormones. [1, 11, 17, 18, 19]

Microorganisms are a major cause of unwished food changes.. These changes can decrease the nutritional value, psychosensory value and commercial value and they conduct to food spoilage. The activity of microorganisms is based on some complex biochemical processes that are influenced by environmental conditions, the composition of the food, the pH of the environment etc. An important environmental factor is temperature. Distinct from enzymes, which at a temperature close to 0 ° C, they greatly reduce their activity, the microorganisms adapt easily, with some species growing at temperatures below -18°C or above 70°C. [2, 8, 9]

Regardless of the preservation technique, all foods have some influence during storage which, if known, can prevent a decrease in the commercial and nutritional values of food. At the same time, the situation of exceeding the shelf life equivalent to the loss of food character can be eliminated. [2, 9]

MATERIAL AND METHOD

For the present review article, was made a selection of scientific information from twenty bibliographic references, which were centralized and then interpreted.

RESULTS AND DISCUSSION

Qualitative changes in frozen products during storage may be physico - chemical and microbiological changes. Among the physico-chemical aspects, there are also the changes in the vitamin content. [1, 2, 18]

The loss of provitamin A in scalded vegetables is very small and slightly higher in uncooked vegetables. Vitamin B complex suffers minimal losses during storage of frozen products, and vitamin PP resists well during processing and storage. Regarding vitamin C, the losses during storage at – 18 ° C are exemplified, for some vegetables, in table 1. [1, 3, 5, 20]

Sterilization causes some changes in food: enzymes and some vitamins are destroyed, the proteins coagulate, the soluble substances in the product partially pass into the liquid, changes in taste, flavor and structure of products. [2, 3, 11]

Vegetables are widely consumed foods, with an important role in the diet due to their special sensory properties and the nutrients they contain: carbohydrates, organic acids, vitamins, mineral salts, etc. Most vegetables can be used in fresh and processed foods. [3, 8, 10]

Table 1

Vitamin C loss after 6 months of storage at -18 ° C

Vegetables	**Loss of vitamin C,** % averages and variations
Asparagus	12 (11 – 13)
Green beans	43 (30 – 65)
Cabbage	46 (35 – 68)
Cauliflower	50 (40 – 60)
Green pea	46 (32 – 67)
Spinach	65 (54 – 80)

Next, compare the vitamin content of vegetables preserved by sterilization and freezing.. [2, 4, 11, 14, 15, 20] The data are contained in Table 2. and plotted in Figures 1-5.

Table 2

Vitamin content in some sterilized and frozen vegetables

Vegetables	**Type of conservation**	**Vitamin content,** mg/100 g					
		β-carotene	Ascorbic acid	Pantothenic acid (B5)	Niacin (B3)	Riboflavin (B2)	Thiamin (B1)
Asparagus	sterilization	0,30	15,3	0,19	0,82	0,094	0,064
	freezing	0,51	25,2	0,415	1,17	0,14	0,16
Green beans	sterilization	0,18	3,3	0,06	0,32	0,035	0,029
	freezing	0,35	9,4	0,12	0,44	0,10	0,07
Green pea	sterilization	0,27	9,3	0,15	0,99	0,056	0,109
	freezing	0,41	18,7	0,277	2,05	0,10	0,32
Spinach	sterilization	3,39	13,1	0,05	0,32	0,098	0,019
	freezing	4,72	29,3	0,113	0,48	0,16	0,09

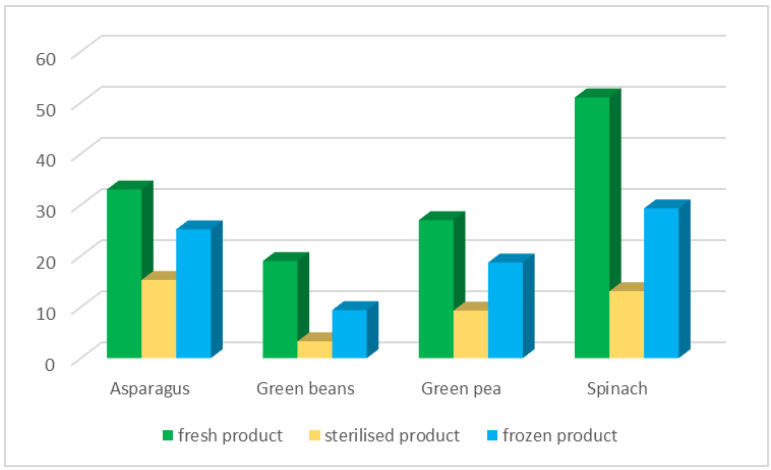

Fig. 1. Loss of vitamin C from some vegetables preserved by freezing and sterilization

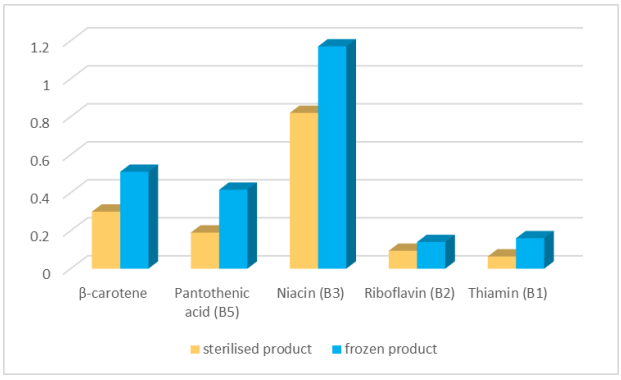

Fig. 2. Vitamin deficiency in asparagus preserved by freezing and sterilization

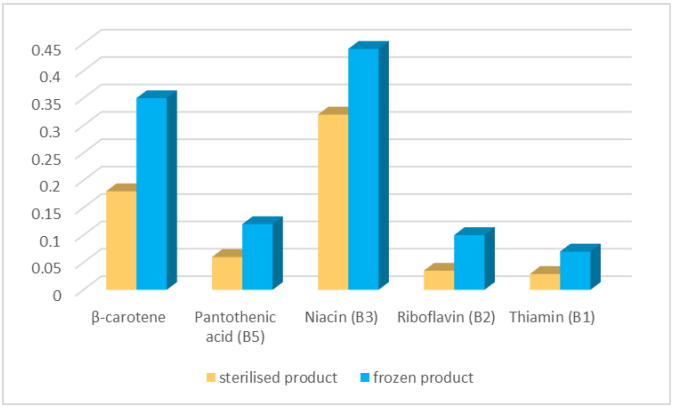

Fig. 3. Vitamin deficiency in green beans preserved by freezing and sterilization

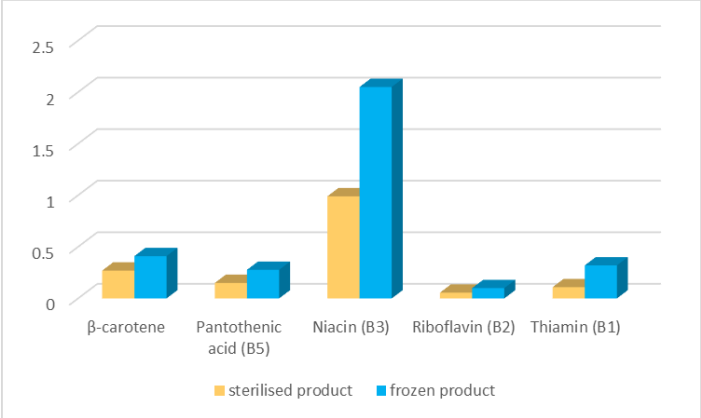

Fig. 4. Vitamin deficiency in green pea preserved by freezing and sterilization

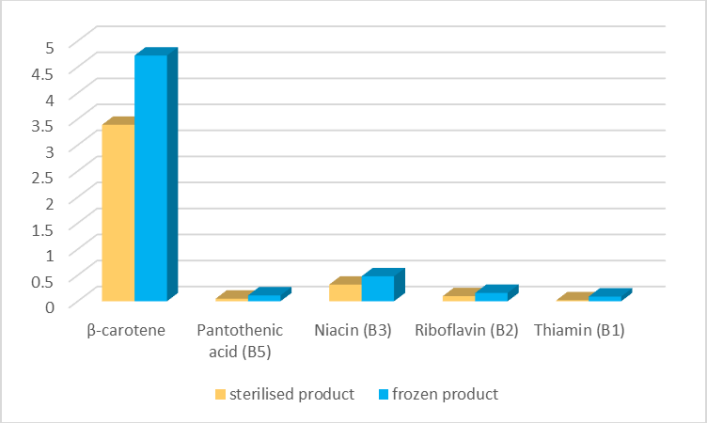

Fig. 5. Vitamin deficiency in spinach preserved by freezing and sterilization

CONCLUSIONS

Following the study carried out in this paper, several conclusions can be drawn

The main sources of vitamins are vegetable products - vegetables and fruits, but should not be neglected in the diet the products of animal origin, especially for the intake of fat-soluble vitamins.

The culinary processing of the vegetal and animal raw materials determines the decrease of the vitamin content, reason for which it is recommended the consumption in fresh state, as little processed as possible, in order to ensure the daily necessities.

The data presented and illustrated graphically show a decrease in vitamin content in vegetables preserved by freezing and sterilization compared to fresh products and, at the same time, a decrease in vitamin

deficiency in products preserved by freezing compared to their preservation by sterilization.

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