THE ANALYSIS OF THE ALIMENTARY QUALITY FOR THE PROMOTING IN THE CULTURE OF THE CHINESE CABBAGE IN THE N-W AREA OF ROMANIA

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Abstract

In order to underline the nutritional quality of the Chinese cabbage was analyzed the content of nutritional factors, among which in important quantities are vitamin A carotene, chlorophyll with important antianemic and plastic properties to which are added important quantities of bioavailable and assimilable Ca in the body in a percentage of 50%, nutritional factors that the body needs in different physiological conditions or in different environment conditions. The evaluation of the nutritional quality of the Chinese cabbage in the NW area of Romania has as purpose the promoting in the culture in this area considered favorable to the culture of some vegetables less known by the consumers but with a superior quality and easily to be cultivated due to the higher thermal gradient and the early coming of the spring.

The ensemble of measures that assure the correct establishing of the nutritional characteristics of the Chinese cabbage in order to promote in the culture beside the eco physiologic and technologic characteristics lead to the informing of the interested persons on the requests of the vegetable plants regarding the water, air and soil, factors that are in complex relations of interdependence, and their influence on the alimentary quality and the exploitation of this vegetable.

Key words: alimentary quality, Chinese cabbage, promoting and diversification of the vegetables, the nutritional factors from the vegetables

INTRODUCTION

Romania cultivates a large area of vegetables, variable annually depending on the evolutions of the market. The average area cultivated per inhabitant was in 2008 of 0,013 ha, compared to 0,005 ha the average in EU.

In Romania the offer of vegetables is unstable, which creates difficulties in organizing of the branch of these products, for which it is needed the concentration of the horticultural specialists and of the specialists from the alimentary industry in order to obtain a greater production of superior quality, with rhythmic supplying that would assure the availability of the national product on the alimentary market, being for that matter one of the main objectives to which the sector performance depends.

The main argument of the diversification of the present range is the alimentary importance of some species less cultivated, their biochemical

content completing the role of the vegetables in the rational diets that provide the limiting of the consumption of food, of animal nature, rich in fats, in favor of the vegetal plants as an unlimited source of vitamins, mineral salts, organic acids, nutritional substances with plastic role, energetic and bio catalyzer (Ciofu, 2010; project p.s. 3.2.1.).

An impressing sort of oriental vegetables became gradually available in the last period of time also in the western areas. The subtle flavor, the tender texture, the special colors and their nutritional quality made it possible for their fast entrance in the gardens and kitchens of the people, these being cultivated not only by the amateur gardeners but also by the great producers.

In parallel with the evolution of the white cabbage head in Europe, also in China were developed cabbage plants, that are also part of the same family with the cabbage that is often used in the kitchens from the western areas, the *Brassicacea* family. Both evolved from wild ascendants, in the past being important sources of food, and in the present both present many varieties that are sold during the entire year (Davidson *and* Tom, 2006).

From the case studies it results great shortages in organizing the production and its selling. These shortages are reflected on the national level in the decline of the vegetable sector and the loss of the markets by the Romanian producers in favor to the imports and of great supermarkets.

MATERIAL AND METHOD

The analysis of the nutritional quality of the Chinese cabbage imposes the performing of some determinations regarding the content in dry soluble substance that was performed on refractometric way. Another necessary element for the appreciation of the nutritional quality of the Chinese cabbage is the determination of the titrating acidity, of the content of organic acids that assure the balance between sugar-acidity, conferring a pleasant taste and a refreshing effect on the body. The titrating acidity was expressed in mg apple acid /100 g (Marca G., 2003). Generally the acidity of the fruits and vegetables depends on the presence of the apple acids, tartric, citric and oxalic acids, free or in different combinations. The fresh horticultural products or processed differently present a real acidity and potential acidity, and the sum of these represents the total titrating acidity. The present acidity is given by the ions of hydrogen and is measured by the determination of the pH, and the potential acidity is given by the ions of hydrogen from the non dissociated molecules of acids.

To these analyses was added also the determining of the content in vitamin C, determination that contributes to the establishing of the alimentary quality of the vegetable products, using the iodometric method

that uses as oxidant, the iodine that comes from the action of the Potassium iodate (KIO_3) on the Potassium iodide (KI) (http://chem.ubbcluj.ro/files/Vitamina _C.doc):

$$KIO_3 + 6HCl + 5KI = 3I_2 + 6\ KCl + 3H_2O$$

$$I_2 + H_2O = O + 2HI$$

RESULTS AND DISSCUSIONS

The results of the analyses regarding the determination of the alimentary quality of the two breeds of Chinese cabbage, pekinensis variety studies (table 1) indicates an average content in dry soluble substance of 4,40 %, at the Granat breed and 5,63 % at the Vitimo hybrid, with an average of 5.015.

Table 1

The quantity of dry soluble substance in the leaves of Chinese cabbage *pekinensis* breed

Breed / Hybrid	The average content in the dry soluble substance %
Granat	4.4
Vitimo F1	5.63
Average	5.015

Following the determination of the content in acidity expressed in apple acid can be observed that (table 2) at the Granat breed the content of apple acid was of 0,080%, while at the plants belonging to the Vitimo hybrid the content of acidity was of 0.148%.

For a presentation as real as possible regarding the content in vitamin C at the *pekinensis* breed of the Chinese cabbage it can be determined the content of this vitamin from two parts of the plant, more exactly from stalk and from the foliar limb because between the two parts there are very large differences regarding this characteristic.

Table 2

The content in acidity at the *pekinensis* breed

Breed / Hybrid	The content in acidity %
Granat	0.080
Vitimo F1	0.148
Average	0.114

Following the determination in content of vitamin C of the Chinese cabbage (table 3) we can observe that the greatest content of this vitamin was obtained in the foliar limb at the Vitimo hybrid, to which in 100 g of fresh product is found a quantity of 59.84 mg of vitamin C, and at the Granat hybrid, where it was obtained a content of vitamin C of 45,76 mg/100 g fresh product compared to the content of vitamin C from the stalk that registered values of 10,56 mg/100 g fresh product at the Granat hybrid and respectively 24.64 mg/100 g fresh product at the Vitimo hybrid.

Table 3

The content in vitamin C at the *pekinensis* breed

Breed / Hybrid	The content in acidity - foliar limb mg/100 g s.p.	The content in acidity - stalk mg/100 g s.p.
Granat	45/76	10.56
Vitimo F1	59.84	24.64
Average	52.8	17.6

CONCLUSIONS

The correct establishing of the nutritional quality of the Chinese cabbage imposed also the research of the ecophyisiological demands of the plant so that the culture would benefit of optimum conditions of growth, easily assured that would determine increases of great production with the purpose of promoting in the culture.

The results of the researches underline the fact that the correct establishing of the nutritional quality of the Chinese cabbage based on the results regarding the content of dry substance, the content of vitamin C and the content of organic acids lead to values that satisfy the demands of food with supreme benefits for the human being.

Placing in the foreground the important nutritional value of the vegetables in the rational diets, many of the vegetable plants represent valuable raw material for the alimentary industry, being demanded very much by the consumers due to these nutritional qualities.

The promoting of the vegetable consumption with superior alimentary qualities leads to the improving of the access to the safe aliments for consumption that give to the body a significant content of nutritional factors necessary for the maintaining of the health.

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