

EVALUATION OF SELECTED QUALITATIVE PARAMETERS IN SEVERAL VARIETIES OF CONSUMABLE POTATOES

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Summary

In this work we assessed the technological and nutritional quality of potato tubers of the selected varieties of consumable potatoes. In particular, we focused on the influence of the storage conditions on the dynamics of changes of individual parameters. The presented results show that the storage conditions as well as the after-harvest treatment have to be carefully selected and optimized depending on the future utilization of the tubers. Based on our data, we can recommend the variety Agria for industrial processing and varieties Santé and Impala for direct kitchen use.

Key words: consumable potatoes, potato quality, potato storage

Introduction

Chemical composition is the main factor influencing the consumable value of potatoes. The nutritional value is determined by the total content of nutritionally important substances and their usability in food.

Potatoes, in the form of main dishes, are one of the main foodstuffs of plant origin. Their energetic contribution is lower. Judging by their alimentary properties, potatoes are close to vegetables. By covering 25-43 % of all vitamin C intake, they are an important source of this vitamin in human diet. In addition, potatoes contain significant amounts of K and Mg, which favorably affect muscle and heart function.

Because of the high content of minerals, especially potassium, potatoes belong to alkaline foodstuffs and contribute to counterbalancing meals of an acidic nature.

Vitamin C is the most important vitamin in potatoes. It helps to remove toxic substances from an organism produced by the biological metabolism and is an important factor in bone development. Unfortunately, this vitamin is rather unstable and is quickly destroyed during potato treatment.

The nitrogen-containing compounds of potatoes rank among the most valuable of all plant products. Their average content in a fresh potato tuber is 2 % (1% for proteins). Potato proteins, with a substantial lysine content, are one of the two most valuable plant proteins consumed in our country.

Starch forms a substantial part of the dry weight of potato tubers, between 12 % to 23 % in fresh material. It is composed of amylose and amylopectin in a ratio of 2:8. It constitutes almost 90 % of the total energy content in the dry weight and 70 % of the total dry weight. Its amount is genetically determined, depending on a given variety.

In potato tubers, sugars are presented in the form of sucrose, glucose and fructose. The average sugar content is 0.46 - 1.72 % of the total tuber weight, but can be increased to 5 % and more under appropriate storage conditions.

Materials and methods

In the experiment we analyzed parameters of nutritional and technological quality of tubers of consumable potatoes - vitamin C content, content of nitrates, dry matter and starch and content of simple and reducing sugars. The potato tubers were stored in a store with regulated atmosphere at the temperature of 5°C and humidity 85 %. All samples were subjected to chemical analysis of individual parameters. The following potato varieties were evaluated: Agria, Impala, Picasso, Raja and Santé.

Results and discussion

Vitamin C content, which is important from a medical point of view, usually varies in a range of 9-25 mg per 100 g of fresh tuber weight. In the evaluated varieties, the vitamin C values were in the range of 18.3-24.5 mg per 100 g of fresh tuber matter.

At the beginning of the storage period, the highest levels of vitamin C (above 23 mg per 100 g of the fresh weight) were observed in varieties Santé (23.4 mg per 100 g of the fresh weight), Agria (23.8 mg per 100 g of fresh weight) and Raja (24.5 mg per 100 g of the fresh weight) in 1997.

The amount of vitamin C gradually declined during storage. At the end of the storage period the vitamin C levels range between 12.1 and 21.7 mg per 100 g of the fresh weight. The smallest drop was observed in the variety Agria (23.8-23.3-21.7 mg per 100 g of the fresh weight). On the other hand, the variety Picasso exhibited the highest vitamin loss: 18.3-16.6-12.1 mg per 100 g of the fresh weight).

In 1998, the levels of vitamin C appeared slightly lower (20.6-11.35 mg per 100 g of the fresh weight). The smallest amount was observed in the variety Santé.

The maximal allowed nitrate levels for potatoes intended for storage are 250 mg of NaNO₃ per kg of the fresh tuber weight. The levels observed at the beginning of the storage period in 1997 were in a range of 122 to 181 mg.kg⁻¹. The highest levels were observed in the varieties Agria (181-204-165 mg.kg⁻¹) and Raja (151-218-183 mg.kg⁻¹). The nitrate content is rather an unstable parameter of quality, being strongly influenced by the usage of fertilizers and ambient conditions. In 1998 the nitrate levels exhibit little variance, which decline during storage.

The varieties Raja and Santé exhibited the highest levels of starch at the beginning of the storage period with 18.9 % and 18.10 %, respectively. The lowest levels, on the other hand, were found in Agria (13.66 %) and Impala (13.93 %). In the final stage of the storage period the starch levels dropped substantially, which was mirrored by an increase in the levels of sugars - its metabolites. The sharpest decline was observed in the variety Picasso (17.75-11.18-8.52 %) and, on the contrary, Agria exhibited the most stable starch content (13.66-14.73-11.54 %). The 1998 harvest was characterized by rather stable starch levels during the storage period in all varieties.

Observed levels of simple sugars in the examined varieties at the beginning of storage lay in a range of 0.75-0.98 %. The highest levels during the whole course of storage were observed in the variety Picasso (0.80-1.10-1.12 %), the lowest in Agria (0.50-0.50-0.79 %).

The 1998 sugar values were comparable in all varieties, only in the case of Impala and Picasso they exceeded 1 % during storage.

Reducing sugars (glucose and fructose) are an important parameter influencing the potential usage of the tubers for making potato chips, in which case their total amount should not exceed 0.25 % of their fresh weight. At the beginning of storage the level of the reducing sugars ranged up to 0.5 %, but only in the varieties Raja and Picasso their amount did not exceed 0.25 % recommended for fried products (Raja 0.21 %, Picasso 0.25 %). However, during the storage period the amount of the reducing sugars rose due to the starch bio-conversion.

In 1998 the varieties Agria and Santé exhibited the lowest reducing sugars levels.

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OCCURRENCE OF CADMIUM AND LEAD IN DAIRY PRODUCTS IN THE SLOVAK REPUBLIC

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Summary

We analysed 96 samples of dairy products (52 of yoghurts and 44 of cheese) on the content of cadmium and lead. An average values contents of cadmium and lead in yoghurts from import were 0,00246 mg/kg, respectively 0,03377 mg/kg and in domestic yoghurts 0,00192 mg/kg, respectively 0,04735. In cheese from import were the mean contents of cadmium and lead 0,00345 mg/kg, respectively 0,04782 and in cheese from domestic production 0,00236 mg/kg, respectively 0,05005 mg/kg.

Key words: cadmium, lead, dairy products, cheese, yoghurts

Introduction

Metals and other elements in the food are of interest because of their potential for effects on human health some have no known beneficial biological function and exposures may be harmful to health (Ysart et al. 2000)

For example, organic mercury compounds are neurotoxins, exposure to lead can be harmful to neuropsychological development, and cadmium can affect renal function. While some elements, such as copper, chromium, selenium and zinc are essential to health, they may be toxic at high levels of exposure (Ministry of Agriculture, Fisheries and Food, 1998a,b). For safety of health in each populations is important a work regard on protect of food chain before contamination by heavy metals. It has been estimated, that contamination of food chain is 20 % due to own agronomic activity and 80 % is from pollution of foreign source, especially industrial activity. These facts have been conducted by to increase interests about monitoring of health harmless manufacturing food from view contents toxic, and too dangerous metals.