Chemical composition of canned sweet corn juice

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Abstract: *Sweet corn (Sorghum) is an important nutritional, technical and food additive. In only developing countries, it is the main food crop, and flour, cereal and bread products are consumed. In developed countries, mainly the green mass of corn is used as raw material for bioethanol production.*

Sorghum is the most important carbohydrate food. In addition to its nutritional value, its stomach plays an important role in the food industry because of its high content of sugar in its juice. The sugar content in the stomach does not exceed sugar but is different from the composition and the chemistry.

Keywords: *Sweet corn juice, crude protein, non-fibre carbohydrate degree of salinity, sugar content, raw materials, phenological observations, stem segmentation, entanglement phases, flowering phases, milky ripeness phases.*

1. INTRODUCTION:

Sorghum serves as a starting source for the production of sorghum, syrup, alcohol and other products. Sorghum is a reserve crop in the production of sorghum syrup. 200 tons of sugar cane can be obtained from 100 hectares of sardine planted soil (average green-mass yield is 30 t/ha and 18% succeeds) [3, 8].

Based on the information provided in the literature, Uzbekistan-18 species of sorghum were researched by experts from the Tashkent Research Institute of Selection and Seed Breeding and the Tashkent State Agrarian University in Zangiota, Kibray, Bekabad and in this researches are conducted with average

The experimental agrotechniques were conducted in accordance with the developed agro-technical measures in Tashkent region. Seeds of 18 varieties of soybean seeds were planted in the last ten days of April in experimental areas of three provinces of Tashkent region. The area of the experimental area is 200 m^2 and the number of planting trees is 80 thousand. The grass sprouted 10-12 days smoothly. During the period of crop cultivation, 2 times cultivation, feeding one time, 2 times fertilizers (500 kg of nitrogen fertilizers in physical terms) and 4 times irrigation works were carried out from agrotechnical arrangements [4].

The first time the plant was formed by the number of leaves 12-13, the second time the plant height was 57-205 cm, the number of leaves was 12-15 pieces and the number of joints was 5-10 pieces, the third time it was determined that the plant Uzbekistan 18 varieties of cornea was biologically observed in three districts every 15 days, the number of leaves was 14-18 cm, the number of As a result of the conducted phenological observations, it became known that in the first 15 days the plant had to determine only the length of the plant and the number of leaves by slow growth, in the second and third fifteen-day observations the syllable, the length of the kerchief was also studied.

The total weight of each plant, leaf weights were measured using laboratory obtained by subtracting the plant from the four during the bud period of the green mass yield and the amount of sugar in the juice separation equipment contained in the cocoon, when we studied the laboratory apparatus [6].

2. MATERIALS AND METHODS:

The aim of present study was to determine chemical composition of canned sweet corn juice, the crude protein content of sweet corn grain obtained after *Vicia sativa* plant was significantly ($p<0.001$) higher than that obtained after wheat plant. The crude protein content of sweet corn grain ranged from 13.23-14.02% of DM. On the other hand, NDF, EE and NFC contents of sweet corn grain obtained after *Vicia sativa* plant was significantly ($p<0.001$) lower than that obtained after wheat plant. However, the previous plant had no significant ($p>0.05$) effect on the cellulose and ADF contents of sweet corn grain. There is a significant relationship among nutrients contents of sweet corn grains. The CP and ash content were negatively correlated with NDF and ADF, whereas the CP and ash content were positively correlated with EE and NFC contents of sweet corn grain. On the other hand, NDF content was negatively correlated with EE and NFC of sweet corn grain. The EE content was positively correlated with NFC. The previous plant affected the chemical composition of sweet corn grain obtained as a second crop. The sweet corn plant should be sown after *Vicia sativa* to obtain sweet corn grain with high protein, ash and non-fibre carbohydrate contents[2, 7].

All chemicals were of analytical reagent grade. Deionized water was used throughout. The following compounds were used: 0.1 mol/l HCl; 1.0 mol/l NaOH; 1.2 mol/l H_3PO_4 (dilute 12.2 ml of 85% acid in a 100ml flask); 1% solution of orthophtalate aldehyde; 1 mg/ml histamine solution (dissolve 167.4 mg of histamine hydrochloride and add 0.1 mol/l HCl in 100ml flask). The capillary electrophoresis instrument was programmed to run a voltage gradient of 5–30 kV over 13 min, with replenishment of the sodium citrate (20 mM, pH 2.5) buffer after every injection. The following rinses were used after each sample: water 1 min, aqueous *NaOH* (0.1M for paste extracts, 0.5M for fruit ex-tracts) 1 min, water 1 min, running buffer 1 min. Detection was at 212 nm and the operating temperature was set to 35°C. Samples and standards were injected hydrodynamically [1].

3. RESULTS AND DISCUSSIONS:

Results were determined as mean ± SD of dry weight from three replicates in each test. The samples were analyzed by wet digestion method and standardized international protocols were followed for the preparation of material and analysis of heavy metals contents and analyzed by Atomic Absorption Spectrophotometer in Research Laboratory in Pharmaceutical Sciences Branch, Islamic Azad University.

The mean values of mineral and heavy metals and histamine concentrations in canned and frozen corn samples studied are given in Table 1. In table 1, obtained results show that, the highest concentration in canned food samples was for tin, 314.22±18.04 and lowest 33.74± 6.02 (µg.g-1 DW). According to variance analyses of data, heavy metal concentration and histamine in canned corn samples were significantly affected by company factory and time of storage.

Table 1
Chemical composition of canned sweet corn juice

Principle	Nutrient Value	Percentage of RDA
Vitamins		
Folates	42 µg	10.5%
Pantothenic acid	0.717 mg	14%
Pyridoxine	0.093 mg	7%
Vitamin A	187 IU	6%
Vitamin C	6.8 mg	11%
Vitamin E	0.07 mg	<1%
Vitamin K	0.3 µg	2%
Electrolytes		
Sodium	15 mg	1%
Potassium	270 mg	6%
Minerals		
Calcium	2 mg	<1%
Copper	0.054 mg	6%
Iron	0.52 mg	6.5%
Magnesium	37 mg	9%
Manganese	0.163 mg	7%
Selenium	0.6 µg	1%
Zinc	0.46 mg	4%
Phyto-nutrients		
Carotene-ß	47 µg	--
Carotene-α	16 µg	--
Cryptoxanthin-ß	115 µg	--
Lutein-zeaxanthin	644 µg	--

Iron Determination

The aliquot was passed through the atomic absorption spectrophotometer to read the iron concentration. Standards were prepared with a standard stock of 10 mg/L using ferrous ammonium sulphate where 3 – 60 ml of iron standard solution (10 mg /L) were placed in stepwise volumes in 100 ml volumetric flasks. 2 ml of per chloric acid were added and then brought to the volume with distilled water. The concentration of iron in the aliquot was measured using the atomic absorption spectrophotometer in mg/L. The whole procedure was replicated three times (26, 27, 28, 29,30).

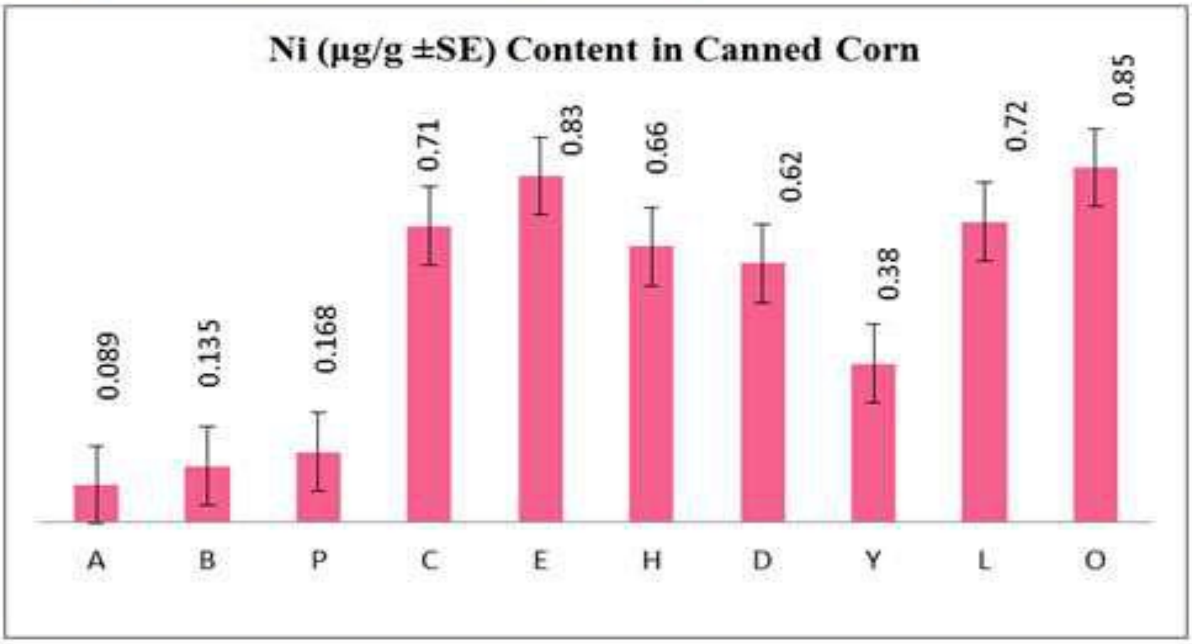
Calcium, Sodium and Magnesium Determination

5 ml of the aliquot were placed in a titration flask using a pipette and diluted to 100 ml with distilled water and subsequently 15 ml of buffer solution, ten drops of Eriochrome black T indicator and 2 ml of triethanolamine were added. The mixture was titrated with Ethylene-Diamine-Tetra-Acetate (EDTA) solution from red to clear blue.

Zinc, Manganese, Copper, Nickel , Tin and Potassium Determination

For Zinc, Manganese, Copper, Nickel, Tin and Potassium concentration in canned and frozen corn samples, powered samples were dried in oven for 36 hours at a temperature of 85°C. The samples were then ground and sieved through 0.5 mm sieve. The powdered samples then subjected to the acid digestion using concentrated nitric acid (65% Merck), Sulfuric acid (96.5% Merck) and per chloric acid (70% sigma). Analar grade hydrogen peroxide (about 30%) also was used for the digestion. Application of concentrated HNO_3 along with thirty percent hydrogen peroxide H_2O_2 (Merck) for mineralization of samples to the complete digestion of samples following Environmental Protection Agency (EPA) Method 3052 was done [4, 5].

Figure 1- The mean content 0f Nickel (µg.g-1 DW ± SE) in canned corn samples in studied popular brands



4. CONCLUSION:

Two gram of air-dried of each homogeneously corn samples accurately weighed and 30.0 mL of the digestion mixture (4 parts by weight of nitric acid: 2 parts of Sulfuric acid & 3 parts by weight perchloric acid) and heated slowly by an oven and then rise the temperature. The remaining dry inorganic residues were dissolved in 30.0 mL of concentrated nitric acid and the solution used for the determination of trace and essential mineral elements. Blanks and samples were also processed and analyzed simultaneously. All the chemicals used were of analytical grade (AR). Standardized international protocols were followed for the preparation of material and analysis of heavy metals contents (2, 20-24). The samples were analyzed by Flame Emission Spectrophotometer Model AA-6200 (Shimadzu, Japan) using an air-acetylene, flame temperature: 2800°C, acetylene pressure: 0.9–1.0 bar, air pressure: 4.5–5 bar, reading time: 1–10 sec (max 60 sec), flow time: 3-4 sec (max 10 sec), using at least five standard solutions for each metal and determination of potassium content was followed by FDA Elemental analysis (25) In order to verify of reliability of the measuring apparatus, periodic testing of standard solutions was performed. The accuracy was checked using quality control test for fungi and their substrate samples to show the degree of agreement between the standard values and measured values; the difference was less than 5%.

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