USE OF JERUSALEM ARTICHOKE AS A POTATO SUBSTITUTE IN CHIPS PRODUCTS

BY : CEM BALTACIOĞLU

SUPERVISOR: Prof. Dr. ALİ ESİN

Patent Pending : 08.02.2010

Introduction

- Sunchoke
- Sunroot
- Earth apple
- Topinambur
- Yer elması

Jerusalem artichoke (*Helianthus tuberosus*)

Composition of Jerusalem artichoke (%)

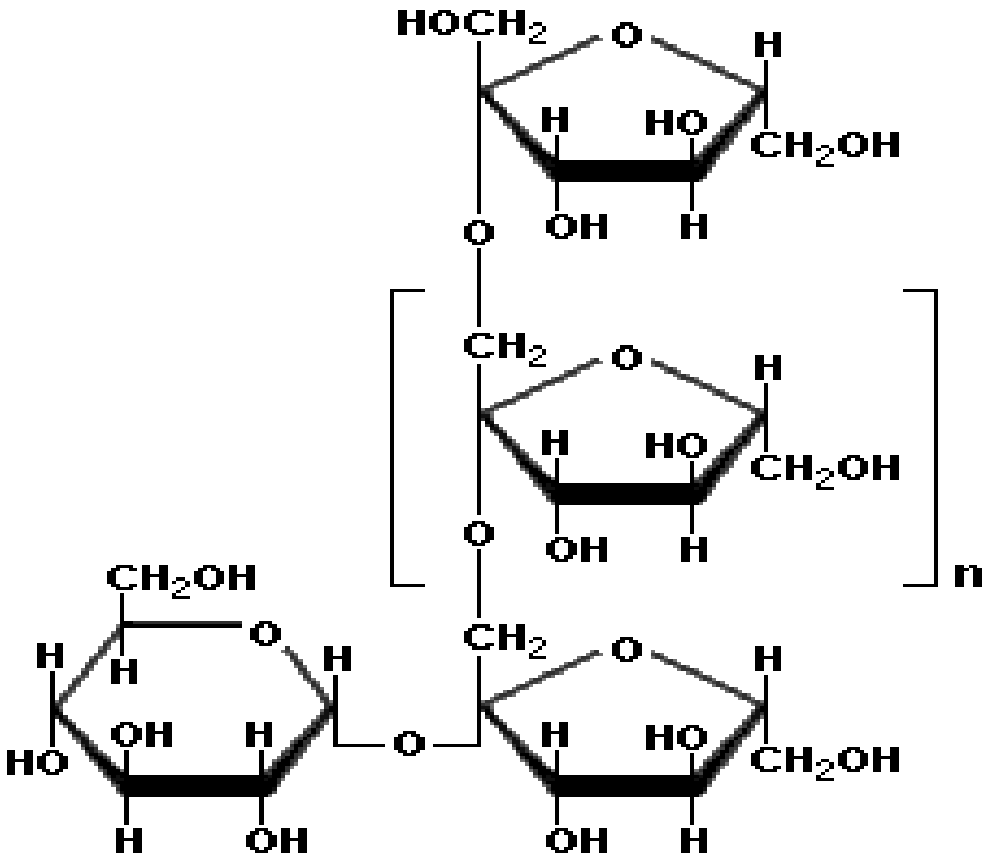
- 80 water
- 15 carbohydrate
  - 80% inulin
  - 10-13% sucrose
  - 3,5-5% reducing sugar
- 1-2 protein
- 0,8 mineral
- 0,2 fat

Inulin

- The scientific data available on the nutritional effects of inulin provide strong evidence of a prebiotic effect, improvement of bowel habit and improved calcium bioavailability, stimulating the production of short-chain fatty acids, reducing the cholesterol level in blood serum, and diminishing the risk of cardiovascular diseases.

- Inulin is practically indigestible for all higher animals, it can be used a source of dietary fiber.

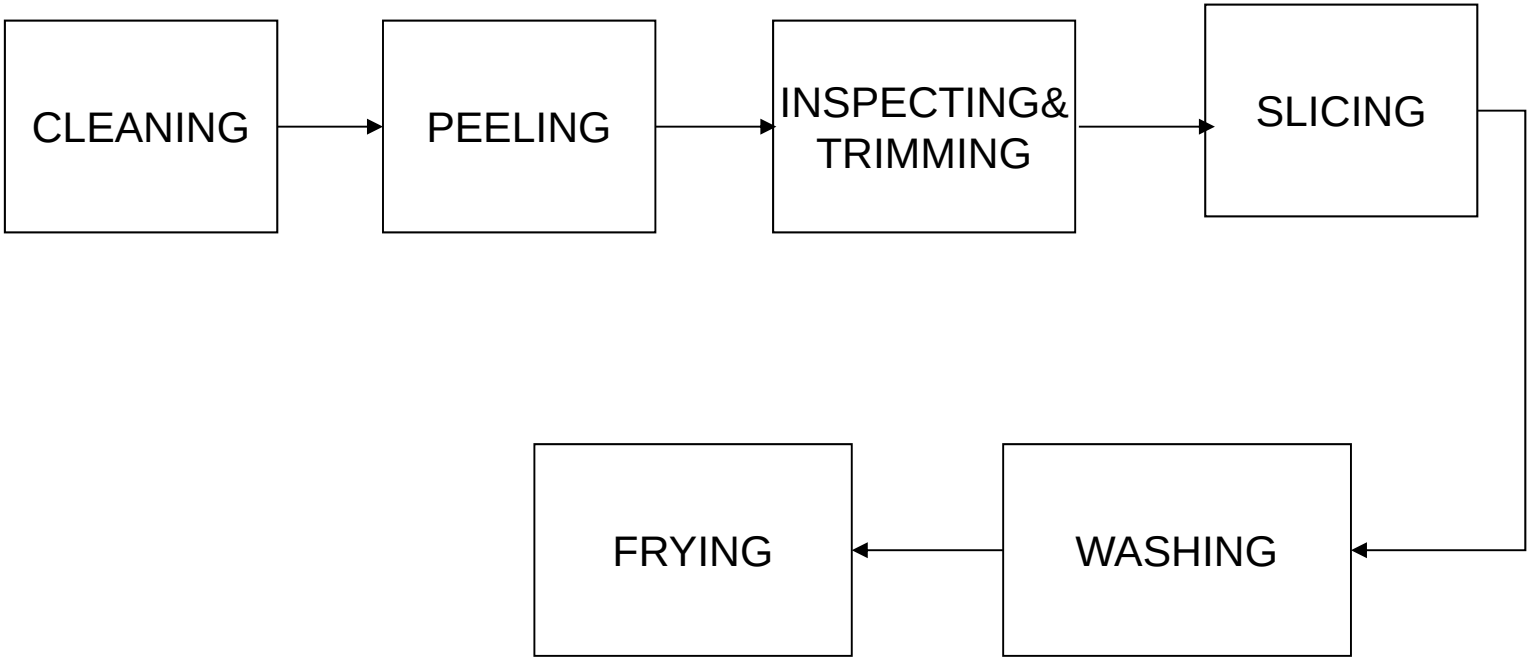
Inulin n = approx. 35 $(C_6H_{10}O_5)_n$



The Aim of This Work

- Jerusalem artichoke is a widely grown produce in Turkey, and it has advantegous properties as compared to potatoes.
- Its use as a potato substitute in the products whose raw material is potato will increase its economical and nutritional value.
- For diabetic patients sunchoke is a superior alternative for chips, manufacturing and consumption since it contains inuline instead of starch.

Flow Chart of Chips



Material and Methods

- Jerusalem artichoke and commercial sun flower oil are used as a material
- Deep fat frying was used as a method

Aim of frying is

- To reduce chips moisture content,
- To develop the desired texture and color of chips
- To get the basic potato chips flavor

Design of Experiment

- Independent Variables
  - Temperature (160-200°C)
  - Time (150-250 sec)

- Dependent Variables
  - Texture
  - Color
  - Moisture content

Texture

- Texture is a major factor in determining the consumer acceptability of chips and depends on both raw material and processing history

- Texture and color are the most important parameters in the definition of the quality of chips

Color Determination

- The color readings were expressed by CIE

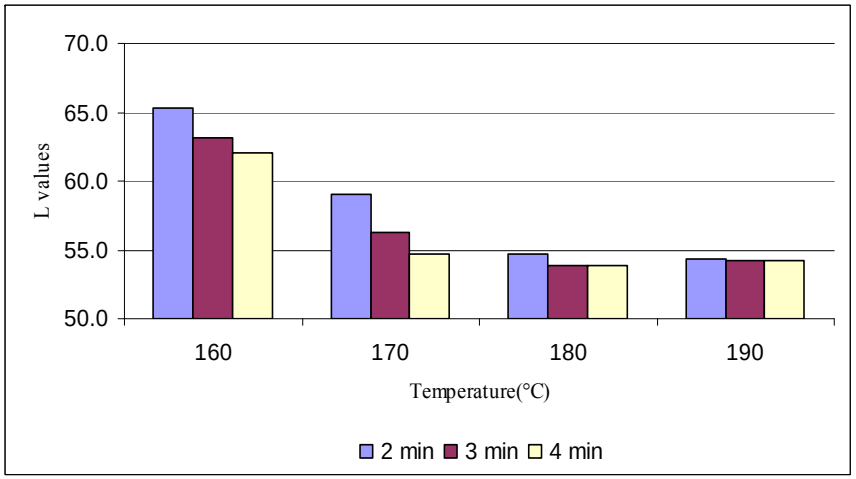
  (L*, a*, b*) color system.

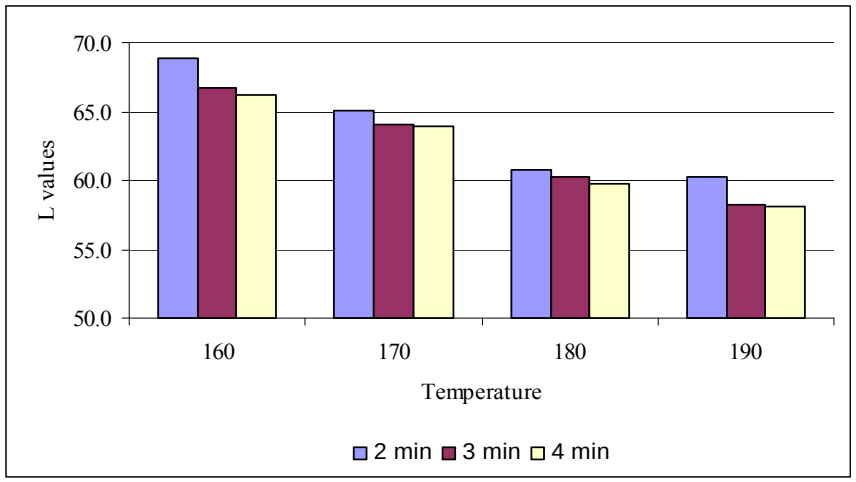
Moisture Content

- The fried samples were dried in a forced oven at 105° up to establishment of constant weight for moisture determination.

Results

JA vs Potatoes : L* values





JA

p < o.o5

Time : 0.048

Temperature : 0.000

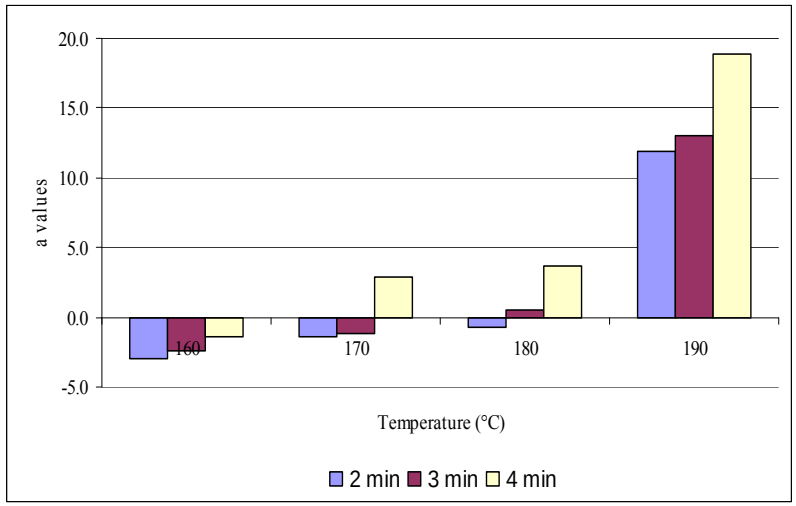
Potatoes

p < o.o5

Time : 0.004

Temperature : 0.000

JA vs Potatoes : a* values

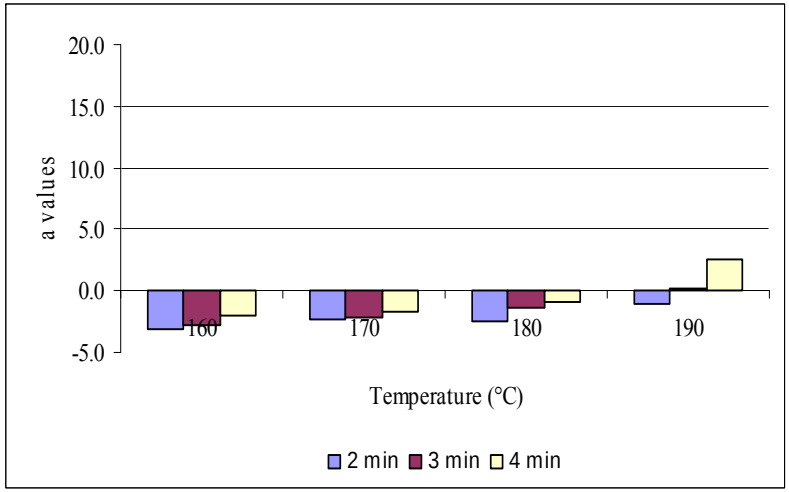


JA

p < o.o5

Time : 0.006

Temperature : 0.000



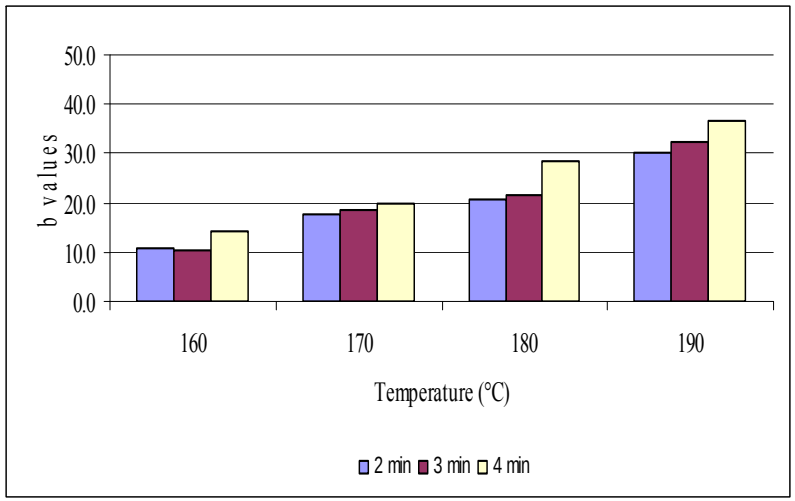
Potatoes

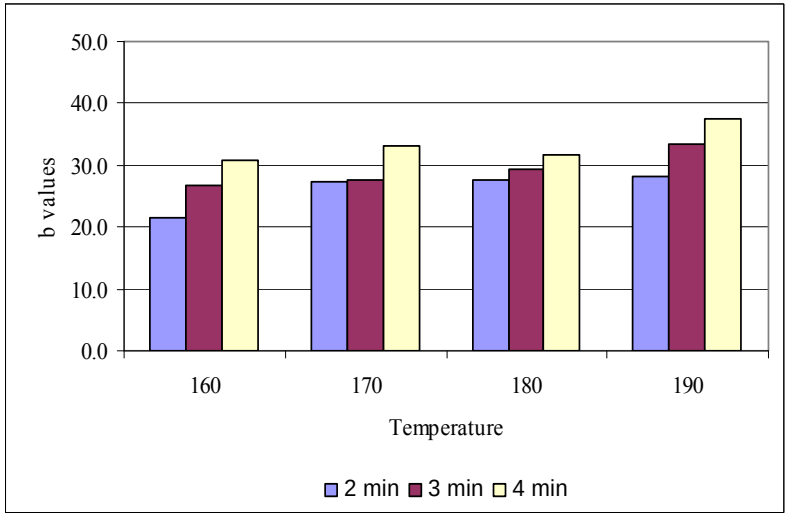
p < o.o5

Time : 0.037

Temperature : 0.006

JA vs Potatoes : b* values





JA

p < o.o5

Time : 0.007

Temperature : 0.000

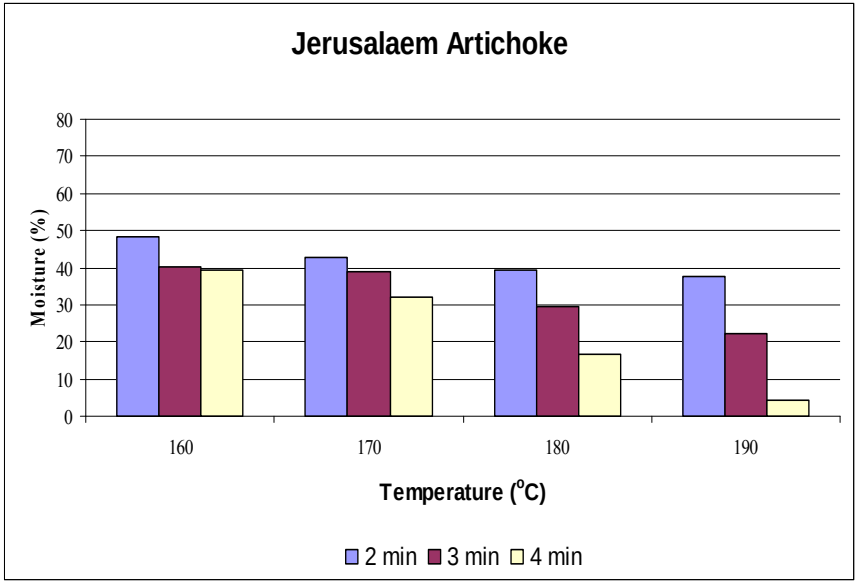
Potatoes

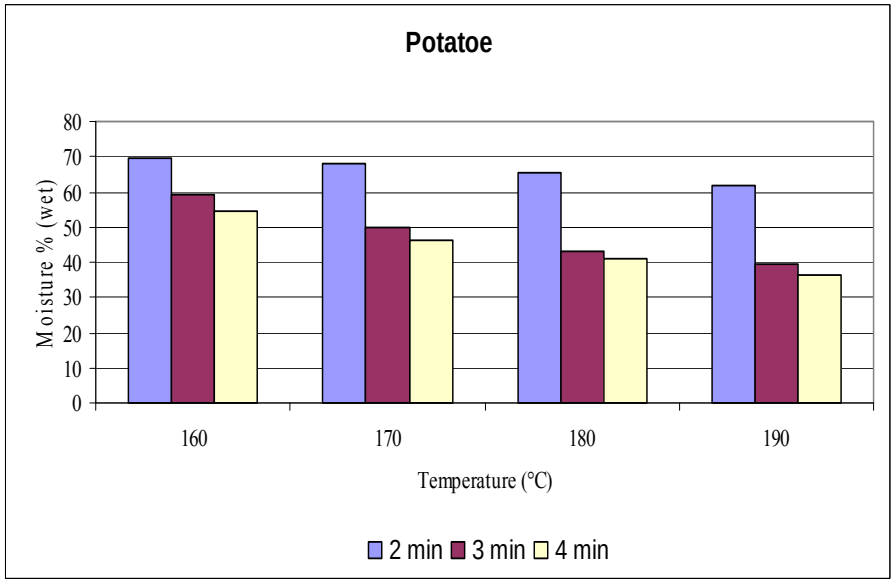
p < o.o5

Time : 0.002

Temperature : 0.013

JA vs Potatoes : Moisture





p < o.o5

Time : 0.005

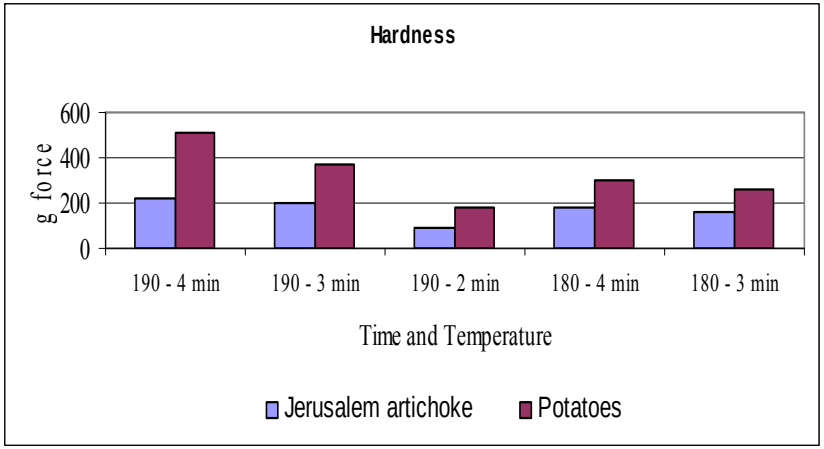
Temperature : 0.007

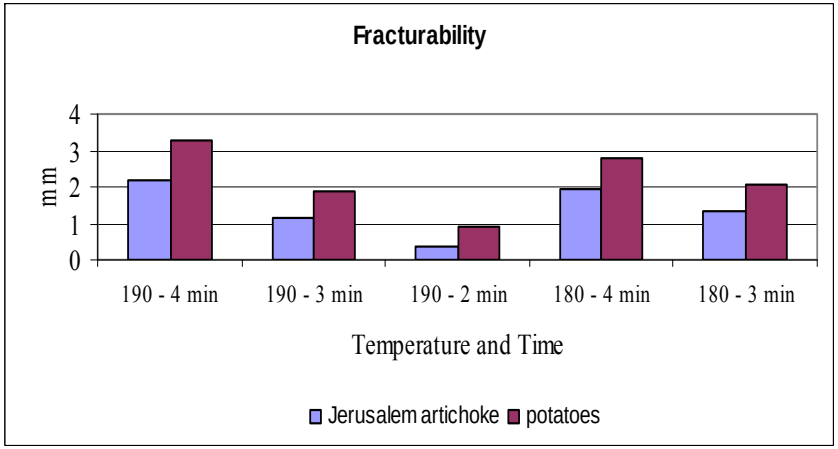
p < o.o5

Time : 0.005

Temperature : 0.003

JA vs Potatoes : Texture





p < o.o5

Time : 0.001

Temperature : 0.013

p < o.o5

Time : 0.002

Temperature : 0.334

Thank You !