

CHIA AND OATS-TWO SUPERFOODS

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Abstract: Chia and oats seeds are part from super foods due to their high content in nutrients. The aim of the study was to present the water content, total phenolic content and total antioxidant capacity of chia and oat seeds samples available on the Romanian market.

Key words: seeds, chia, oat, antioxidant capacity, phenolic content, water content.

INTRODUCTION

Chia (*Salvia hispanica*) is a plant species from the Lamiaceae family, originally from South America. Chia seeds are small, oval, colored with brown, gray, black and white. The word chia derives from the word *Nahuatl chian*, meaning oily. [7,11]

Since ancient times chia seeds have been an important food, being appreciated for their ability to provide energy on long term. In fact, "chia" is the maya word that means "power". [7]

Chia is cultivated for its seeds, which are recognized for its remarkable nutritional value. Chia seeds have a rich content in vitamins, minerals (including sulfur, iron, iodine, magnesium, manganese, and strontium), fiber and antioxidants. Also, chia seeds are an excellent source of proteins and fatty essential acids Omega 3, 6 and 9. [4,6]

The oat (*Avena sativa*) is an herbaceous cereal plant, generally grown as a fodder plant. In food it is used as flakes in muesli, different bakery products, etc. [8]

The origin of the oat species is given by: the Mediterranean Basin (*Avena byzantina*), Abisinia Plateau (*Avena abyssinica*), Asia (south of China) and perhaps Central Europe (*Avena sativa*). [8]

From nutritional point of view, oats is one of the most complex foods, because they contain carbohydrates with slow absorption of fibers, proteins, minerals (especially manganese) and vitamins. According to the Celiac Disease Center from the University of Chicago, oats are gluten-free, but contain a protein called avenin. [10]

MATERIAL AND METHODS

The material were oats and chia seeds available on the Romanian market.

The moisture content was determined based on thermogravimetric method using Sartorius thermobalance. (Bordean et al, 2011) [2]

Total antioxidant capacity (TAC) of the alcoholic seed extracts by CUPRAC method, was made using SPECORD 205 spectrophotometer. Evaluation of TAC using Cupric Reducing Antioxidant Capacity method (CUPRAC) is based on the absorbance measurement of Cu(I)-neocuproine chelate formed as a result of the redox reaction of chain-breaking antioxidants with the CUPRAC reagent, Cu(II)-Nc. Absorbance is recorded at 450 nm light-absorption wavelength (Özyürek, M. et al, 2011). [5]

Total phenolic content determination (TPC) was determined by spectrophotometry, using Folin-Ciocalteu reagent according to the method described by Singleton and Rossi, 1965. The absorbance was measured at 750 nm with a SPECORD 205 spectrophotometer and compared to Gallic acid calibration curve. TPC was expressed as mg Gallic acid equivalents per gram of dried weight (mg GAE g⁻¹).

The estimation of total antioxidant capacity and total polyphenolic compounds was carried out in triplicate, and the results were averaged (Bordean et al, 2016). [1]

RESEARCH RESULTS

The dependence between humidity, total antioxidant capacity and total phenolic content for samples of chia and oat seeds is presented in Figures 1 and 2.

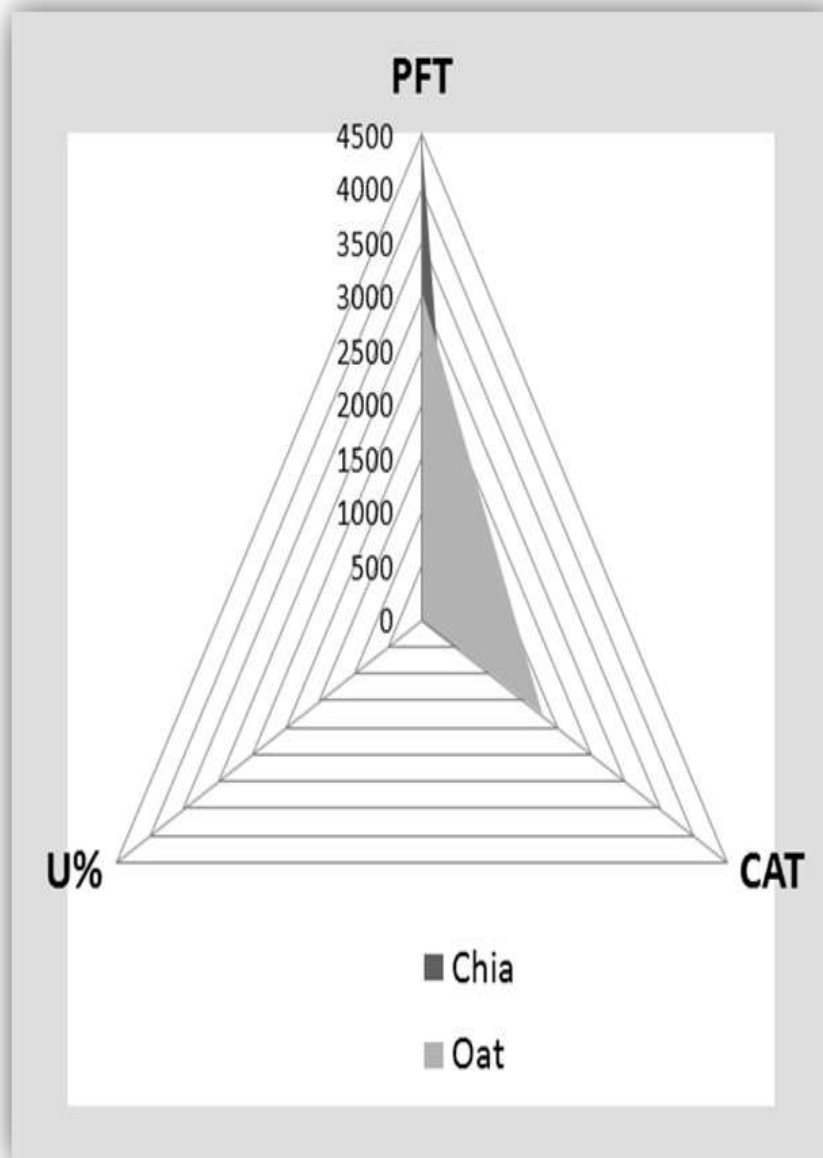


Figure1. Graphical representation of seeds analysis

Source: Legend: Moisture content = U%; Total antioxidant capacity = CAT mg/mL sample; Total phenolic content = PFT mg GAE/ g sample

With values of moisture content and phenolic content lower than of the chia seed samples, oat seed samples are distinguished by a much higher antioxidant capacity. This means that chia seeds might have lost the antioxidant capacity properties due to incorrect storage and preservation procedures and also because an increased moisture content compared to those presented by literature data. [3,9]

At the same time, statistical data and mathematical modelling suggests that the two types of seeds might be recommended to use together due to the other important compounds of chia seeds, even if the TAC is not the desired one.

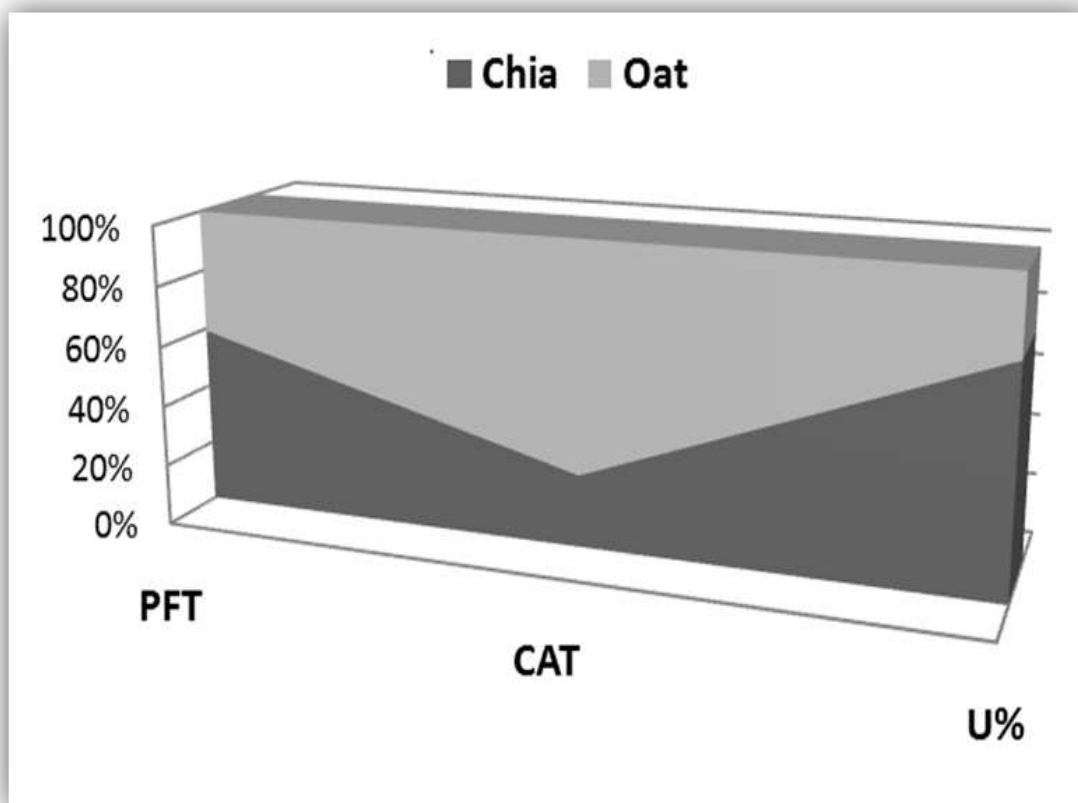


Figure 2. Graphical representation of complementarities of seeds mixtures

Source: Legend: Moisture content = U%; Total antioxidant capacity = CAT mg/mL sample; Total phenolic content = PFT mg GAE/ g sample

CONCLUSIONS

The obtained results recommend the use of mixt oats and chia seeds for a improved diet and also is advising the consumers to check the integrity of the chia seeds package as these seeds can be easy compromised in case of inadequate storage.

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