PlagScan Results of plagiarism analysis from 2017-04-28 13:11 UTC

18.0%

Test

Date: 2017-04-28 13:10 UTC

✱ All sources **27** | Internet sources **27**

☑	[0]	scihub.org/ABJNA/PDF/2010/2/1-2-97-102.pdf 9.5% 6 matches
☑	[1]	www.e3journals.org/cms/articles/1367754217_Kubmarawa et al.pdf 8.3% 5 matches
☑	[2]	www.sciencepub.net/life/life0504/13_lsj0504_69_74_effects.pdf 7.7% 5 matches
☑	[3]	www.ifrj.upm.edu.my/18 (04) 2011/(18)IFRJ-2011-244.pdf 6.3% 4 matches
☑	[4]	cmsadmin.atp.co.il/Content_siamb/editor/59_2_Ovie.pdf 4.9% 4 matches
☑	[5]	www.scialert.net/fulltext/?doi=ajcn.2009.31.39 4.6% 4 matches
☑	[6]	www.elixirpublishers.com/articles/1358776619_54 (2013) 12543-12554.pdf 3.5% 4 matches
☑	[7]	https://www.researchgate.net/profile/Emm...n=publication_detail 2.4% 2 matches
☑	[8]	interesjournals.org/full-articles/bioche...lour.pdf?view=inline 2.4% 1 matches
☑	[9]	https://www.researchgate.net/profile/U_B...gin=publication_list 1.6% 2 matches
☑	[10]	https://www.researchgate.net/publication...faba_bean_Vicia_faba 2.2% 1 matches
☑	[11]	https://evols.library.manoa.hawaii.edu/bitstream/10524/19217/1/59_2_Ovie.pdf 1.5% 2 matches
☑	[12]	article.sciencepublishinggroup.com/pdf/10.11648.j.avs.20170501.12.pdf 1.9% 2 matches
☑	[13]	scialert.net/fulltext/?doi=jbs.2007.464.474 0.7% 1 matches
☑	[14]	www.mdpi.com/1420-3049/21/12/1633/pdf 0.8% 1 matches
☑	[15]	www.sciencedirect.com/science/article/pii/S2352513416300291 0.8% 1 matches
☑	[16]	www.mdpi.com/1420-3049/22/1/47/pdf 0.7% 1 matches
☑	[17]	www.mdpi.com/2076-3921/4/2/410/pdf 0.7% 1 matches
☑	[18]	www.mdpi.com/2072-6643/8/8/465/pdf 0.7% 1 matches
☑	[19]	www.mdpi.com/2076-3921/3/3/618/pdf 0.7% 1 matches
☑	[20]	www.mdpi.com/1422-0067/18/3/660/pdf 0.7% 1 matches
☑	[21]	www.mdpi.com/1660-3397/13/1/141/pdf 0.7% 1 matches
☑	[22]	www.mdpi.com/1422-0067/16/7/15328/pdf 0.7% 1 matches
☑	[23]	www.mdpi.com/1420-3049/18/12/14543/pdf 0.7% 1 matches
☑	[24]	www.scielo.org.mx/pdf/rcsh/v21n3/v21n3a2.pdf 0.7% 1 matches
☑	[25]	www.scielo.org.mx/pdf/agro/v49n6/v49n6a5.pdf 0.7% 1 matches
☑	[26]	documents.mx/documents/a-systematic-appr...ng-discriminant.html 0.6% 1 matches

3 pages, 983 words

PlagLevel: selected / **overall**

13 matches from 27 sources, of which 27 are online sources.

Settings

Data policy: *Compare with web sources*
Sensitivity: *Medium*
Bibliography: *Consider text*
Citation detection: *Reduce PlagLevel*
Whitelist: --

Changes in Amino Acid Profile of African Yam Bean (Sphenostylis sternocarpa): The Effect of Different Processing Methods.

ABSTRACT: The effect of different processing methods namely conventional cooking, microwave cooking and roasting compared with fresh samples on the amino acid profile to determine protein quality of Sphenostylis sternocarpa (African yam bean) flour was investigated. Results indicated that processing had various effects which were in this order: roasting microwave cooking conventional cooking. Total amino acid values were 78.25, 67.57, 72.25 and 80.0 g/100g protein for flour from raw, conventionally cooked, microwave cooked and roasted samples respectively. Essential amino acids namely valine, methionine and phenylalanine in both raw and processed samples were not sufficient to meet human nutritional needs based on FAO/WHO (1991) reference pattern for amino acids. The predicted protein efficiency ratio (P-PER) was 2.26 for flour from the raw sample while PPER of flour from conventionally cooked, microwave cooked and roasted samples were 2.05, 2.19 and 2.31 respectively.

Keywords: African yam bean, Amino acids, processing, predicted protein efficiency ratio

1. INTRODUCTION

Leguminous seeds are good sources of plant proteins [1]. They are nutritious foods and a substitute for an animal protein which arises from the knowledge of the functional properties of the seed flour and other products [2]. Due to malnutrition in Africa as a result of insufficient animal protein, there is an intensive search for alternative sources of protein from minor proteins [3]. Their nutritional and functional properties dramatically affect the overall quality and its technological performance [4].

Foods are processed by various means to get them to a state the body can absorb nutrients maximally. For the legumes, they contain anti-nutritional factors like protease inhibitors, phytates, oxalates, saponins which inhibit or limit maximum absorption of amino acids from them. However, there is a remarkable improvement in the nutritive value and quality of legume seeds which have been achieved through dehulling, heat treatment, germination, fermentation, soaking and partial hydrolysis by proteolytic enzymes [5]. Heat treatments employed in food processing include roasting, grilling, boiling/cooking, microwave cooking, ohmic heating, baking, toasting, frying, etc. These processing methods may have the potentials of reducing antinutritional factors which interfere with protein digestibility and amino acid absorption. The reason stems from the fact that protein quality is defined by its amino acid composition and this influences nutrients derived from them [6].

Sphenostylis sternocarpa (African yam bean) is a legume found in the tropics. It is called ‘odudu', ‘Ukpodudu', ‘Okpodua' [1], ‘Azuma' by some Igbo clans 'Bebe' by the

Yorubas
and in Northern states of Nigeria 'Kashin kaji' [7]. It is a leguminous crop of the family
Leguminosae and sub-family Papilionaceae [1,8]. It is a herbaceous climbing vine which

produces ellipsoid, round or truncated seeds which vary in size and colour ranging from
creamy-white or brownish yellow to dark brown [1]. This work was aimed at studying the
changes effected by various heating methods on amino acid composition of S. sternocarpa
seeds which were used in producing flour respectively.

2. MATERIALS AND METHODS

2.1 Sourcing and Preparation of Materials

Sphenostylis sternocarpa (African yam bean) seeds used for this study was purchased from
Ohafia and Umuahia in Abia State, Nigeria. The seeds used was a mixture of coloured
cultivars of brown, red and white. They were winnowed, and extraneous materials were
removed. The cleaned seeds were divided into four portions of 150g each. Three out of the
four portions were heat processed by conventional cooking for 120 minutes, microwave
cooking (Sonic 5mw-70017, Japan) for 810 minutes and roasting at 1500C for 20 minutes
respectively. The fourth portion was raw, this was used as a control. After heat processing,
the various samples, the conventionally cooked and microwave prepared samples were oven
dried (Ocean Med., Mode DHG- 9053A, England) at 650C for 6h. The individual seed
samples were milled and sieved to obtain flour samples. Powder (i.e flour) samples generated
were microwave cooked, conventionally cooked, roasted and raw African yam bean flour.
Amino acid compositions to determine protein quality of the respective powder samples were
investigated.

2.2 Amino Acid Determination

Amino acid composition of the individual powder samples was determined by the method
described by [9] using Ion Exchange chromatography (Technicon Sequential Multisample
(TSM) amino acid analyser , Technicon Instruments Cooperation, New York, USA). Each
flour sample was hydrolyzed while 10µl of the hydrolyzed sample was loaded into the TSM
amino acid analyser. The analysis lasted for 76minutes. The net height of each peak produced
by the chart record of TSM (each representing an amino acid) was measured and calculated.
Norleucine was used as internal standard. Tryptophan was not determined. Amino acid values
from the chromatogram peaks were calculated whereby the half height of each peak on the
chart was found and width of the peak on the half height was accurately measured and
recorded. Area of each peak was then obtained by multiplying the height by the width at the

half height the Norleucine equivalent (NE) for each amino acid in the mixture.

[7]
NE = Area of Norleucine Peak
Area of each amino acid

A constant 'S' was calculated for each amino acid in the standard mixture as:

[1]
Sstd= NEstd × molecular weight × µAAstd

The amount of each amino acid present in each sample was calculated in g/100g protein =

this method, essential amino acids were scored methionine + cysteine, and phenylalanine +
tyrosine was taken as two distinct units. Amino acid scores (AMSS) were estimated by [11]
formula:
AMSS = mg of amino acid /g of test protein × 100
mg of amino acid /g of reference protein 1
The predicted protein efficiency ratio (P-PER) was calculated from the amino acid composition using the equation developed by [12] stated thus:
P-PER = - 0.468 + 0.454 (Leu) - 0.105 (Tyr)
3. RESULTS AND DISCUSSION
The effect of different processing methods on amino acid composition of African yam bean
flour (Sphenostylis sternocarpa) flour is shown