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Chemical Studies on Quinoa seeds and Its Applications on Some Foods

By

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ABSTRACT

Quinoa is called a superfood due to its great nutritional value. This investigation was aimed to study the chemical composition, physical and nutritional properties of quinoa powder (QP), and their use at different levels in balady bread, fino bread, beef burger and koshary products. Results showed that, the 1000-seed weight and the bulk density values of quinoa seeds were 2.70g and 0.83 g/m³, respectively. The chemical composition showed QP contained significantly higher contents of crude protein, ether extract, ash and crude fiber (13.49, 4.62, 7.81 and 2.43 %, respectively) compared to wheat flour (WF). It was found that QP was an ideal source of minerals, especially potassium (K) and iron (Fe) (808.7 and 13.2 mg/100g, respectively). Amino acids composition of QP had a well-balanced amino acids composition compared to WF especially lysine (4.80g/100 g protein). The computed biological value of quinoa was found to be higher than that of wheat flour. Also, QP oil was rich in unsaturated fatty acids, with ratio to saturated acids in quinoa was about (80.83/19.17%). Moreover, the protein content of bread substituted with QP increased by increasing QP content. Also, the sensory properties of bread were acceptable. There was no noticeable difference ($P \leq 0.05$) between bread substituted with 10% and control sample. The gluten levels went down by raising the levels of QP from 10 to 40% whilst; the protein content increased from 10 to 40% by rising QP replacement levels. The obtained data suggested that QP could be utilized as supplemented source of protein and nutrients especially, in bakery products. Also, it was found that QP is a good source gluten free alternative replacement to WF products. So, supplemented burger with quinoa till 7.5% could be suggested to be made as burgers with good quality suitable sensory quality characteristics. There were no significant variances at $p \leq 0.05$ for color, odor, taste, texture and overall acceptability between control (Koshary with lentil) and Koshary with quinoa seed. Also, substituting lentils with quinoa seeds in koshary results in a significant increase in the ether extract, ash, and available carbohydrates contents between them. It can be concluded that it is necessary to increase the use of quinoa in some bakery products and other products due to its high nutritional value and characteristics.

Keywords: *quinoa seeds, chemical analysis, nutritional value, sensory acceptability, balady bread, fino bread, beef burger, kushary assfar*

List of Contents

Title	Page
List of Contents	I
List of Tables	IV
List of Figures	V
List of Abbreviations	VI
1. Introduction	1
Aim of investigation	3
2. Review of Literature	4
2.1. General characteristics of quinoa (<i>Chenopodium quinoa</i> Willd)	4
2.1.1. Description of quinoa seeds	4
2.2. Physical properties of quinoa seeds	6
2.3. Nutritional value of quinoa powder and wheat flour	7
2.3.1. Gross chemical composition of quinoa powder and wheat flour	7
2.3.1.1. Quinoa powder	7
2.3.1.2. Wheat flour	11
2.3.2. Minerals content of quinoa powder and wheat flour	12
2.3.2.1. Quinoa powder	12
2.3.2.2. Wheat flour	15
2.3.3. Amino acids composition quinoa powder and wheat flour	15
2.3.3.1. Quinoa powder	15
2.3.3.2. Wheat flour	21
2.3.4. Fatty acids composition of quinoa seed oil	22
2.3.5. The phenolic compounds in quinoa powder	25
2.3.6. Saponins	27
2.4. Technological methods	31
2.4.1. Rheological properties of wheat flour's dough and its blends	31
2.4.1.1. Farinograph	31
2.4.1.2. Extensograph	32
2.4.2. Applications of quinoa powder in food products	33
3. Materials and methods	38
3.1. Materials	38
3.2. Methods	38
3.2.1. Physical properties of quinoa seeds	38
3.2.1.1. Seed index	38

Title	Page
3.2.1.2. Seed dimensions	39
3.2.1.3. Bulk density	39
3.2.1.4. The test weight (Hectoliter)	39
3.2.2. Preparation of quinoa powder	39
3.2.3. Analytical methods	40
3.2.3.1. Determination of saponin content	40
3.2.3.2. Gross chemical composition of samples	41
3.2.3.3. Gluten content of the dough	41
3.2.3.4. Determination of minerals content of samples	41
3.2.3.5. Evaluation of protein from quinoa and wheat flour	41
3.2.3.5.1. Determination of amino acids	41
3.2.3.5.2. Determination of Tryptophan	42
3.2.3.5.3. Chemical score of indispensable amino acids	42
3.2.3.5.4. Computed protein efficiency ratio (C-PER)	42
3.2.3.5.5. Computed Biological value of protein (C-BV)	43
3.2.3.6. Fatty acids composition of quinoa seed oils	43
3.2.3.7. Determination of phenolic compounds of quinoa powder	43
3.2.3.7.1. Extraction of total phenolic compounds (TPC)	43
3.2.3.7.2. Determination of total phenolic compounds (TPC)	44
3.2.3.7.3. Qualitative and quantitative determination of phenolic compounds by High Performance Liquid Chromatograph(HPLC)	44
3.2.4. Technological methods	44
3.2.4.1. Preparation of flour blends	44
3.2.4.2. Rheological properties of different flour blends	45
3.2.4.2.1. Farinograph test	45
3.2.4.2.2. Extensograph test	45
3.2.4.3. Preparation of balady bread	46
3.2.4.4. Sensory evaluation of balady bread	46
3.2.4.5. Preparation of fino bread	46
3.2.4.6. Sensory evaluation of fino bread	47
3.2.4.7. Preparation of beef burgers	47
3.2.4.8. Sensory evaluation of beef burgers	48
3.2.4.9. Preparation of koshary	48
3.2.4.10. Sensory evaluation of koshary	48
3.2.5. Statistical analysis	48

Title	Page
4. Results and Discussions	49
4.1. Physical properties of quinoa seeds	49
4.2. Effect of washing with cold water on saponin content in quinoa seeds	50
4.3. Gross chemical composition of quinoa powder and wheat flour	50
4.4. Minerals content of quinoa powder and wheat flour	52
4.5. Evaluation of protein from quinoa powder and wheat flour	53
4.5.1. Amino acids composition	53
4.5.2. Chemical score of indispensable amino acids	55
4.5.3. The computed protein efficiency ratio and computed biological value of quinoa powder and wheat flour (82% extraction)	56
4.6. Fatty acids composition of quinoa seeds oil	57
4.7. Bioactive compounds in quinoa seeds extracts	59
4.8. Technological methods	61
4.8.1. Rheological properties of wheat flour's dough and its blends	61
4.8.1.1. Farinograph properties	61
4.8.1.2. Extensograph properties	63
4.8.2. Balady bread substituted with different levels of quinoa powder	64
4.8.2.1. Sensory evaluation of balady bread	64
4.8.2.2. Chemical composition of balady bread substituted with different levels of quinoa powder	66
4.8.2.3. Minerals content of balady bread:	67
4.8.3. Fino bread substituted with different levels of quinoa powder	68
4.8.3.1. Sensory evaluation of fino bread	68
4.8.3.2. Chemical composition of fino bread (Eish fino) substituted with different levels of quinoa powder.	70
4.8.4. Beef burgers fortified by different levels of quinoa powder	71
4.8.4.1. Sensory evaluation of beef burgers fortified by different levels of quinoa powder	72
4.8.4.2. Chemical composition of beef burgers	73
4.8.5. Koshary substituted with quinoa seeds.	74
4.8.5.1. Sensory evaluation of koshary	74
4.8.5.2. Chemical composition of koshary	75
5. Summary and Conclusion	76
6. Referrnces	80
الملخص عربى	٤-١

List of Tables

Tables	Page
Table (A): Flour blends used in balady and Fino bread preparation	45
Table (1): Physical properties of quinoa seeds	49
Table (2): Saponin content of quinoa seeds	50
Table (3): Chemical composition of quinoa seeds powder and wheat flour (% on a dry weight)	51
Table (4): Minerals content (mg/100g) of quinoa seeds powder and wheat flour	53
Table (5): Amino acids composition (g amino acid /100g protein) of quinoa seeds powder and wheat flour (82 %extraction)	54
Table (6): Chemical scoring of the indispensable amino acids of quinoa seeds powder and wheat flour (82 % extraction)	56
Table (7): The computed protein efficiency ratio and computed biological value of the indispensable amino acids of quinoa powder and wheat flour 82 % extraction	57
Table (8): Fatty acids composition of quinoa seed oils (%)	58
Table (9): Phenolic compounds of quinoa seeds (mg GAE /100g)	60
Table (10): Effect of adding quinoa powder and arabic gum as partial substitute to wheat flour on farinograph parameters of the balady bread dough	62
Table (11): Effect of adding quinoa powder and arabic gum as partial substitute to wheat flour on the extensograph parameters of balady bread dough.	63
Table (12): Sensory evaluation of balady bread substituted with different levels of quinoa powder.	65
Table (13): Chemical composition of balady beard prepared with different replacement levels of quinoa powder (g/100g on dry weight).	66
Table (14): Minerals content (mg/100g) of balady bread substituted with different levels of quinoa powder.	68
Table (15): Sensory evaluation of fino bread substituted with different levels of quinoa powder.	69
Table (16): Chemical composition of fino bread substituted with different levels of quinoa powder (% on a dry weight basis).	71
Table (17): Sensory evaluation of beef burgers fortified by different levels of quinoa powder.	72
Table (18): Chemical composition of beef burgers fortified with different levels of quinoa powder (% on a dry weight basis).	73
Table (19): Sensory evaluation of koshary.	74
Table (20): Chemical composition of koshary (% on a dry weight basis).	75

List of Figure

Figure	Page
Fig. (A, B): Different colors of quinoa plant and seeds.	5
Fig. (1): Fino bread substituted with different levels of QP.	70
Fig. (2): koshary substituted with quinoa seed.	74