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Rediscovery of Couscous in the World

Ayse Nur Yüksel[1], Mehmet Durdu Oner[2] and Mustafa Bayram[3]

[1] Gaziantep University

Received: 8 December 2017 Accepted: 31 December 2017 Published: 15 January 2018

Abstract

World food industry is changing by re-discovering traditional food tastes and techniques. Due to increase in curiosity on gastronomy, new tastes and ?Geographical Signing-food origination?, local foods are started to re-designing by food industry. Couscous is one of them, which is the world-wide known traditional cereal product, today. Its popularity has been increasing, recently. Especially, in the Western market, it is prepared due to its taste, rapid preparation and usage in salads (tabulleh). There are three couscous types such as Turkish, African and pasta-like depending on the formulation, processing technique and usage. Pasta-like couscous is widely produced by pasta companies by using same pasta production line by changing the die of press. Couscous commonly produced by using semolina and sorghum in Africa and Asia, however in Turkey, traditional Turkish couscous is generally prepared by coating of bulgur granules with semolina, wheat flour; egg and water or milk. In the literature, studies have recently been made for enrichment of couscous by either substitution of semolina with legume flours and other grain flours or adding nutritious ingredients to the composition. Worldwide, total exportation and importation quantity of couscous are 124,481 and 126,799 tons, respectively. Nowadays, the need for easy prepared meals increased due to the fast lifestyles and people are more aware about the importance of nutritionally valued products and its benefits to health. Therefore, further studies should be made to produce nutritionally enriched products with fast cooked property to improve the quality properties without the forgetting old tastes.

Index terms— couscous, pasta-like, african, enriched.

traditional food tastes and techniques. Due to increase in curiosity on gastronomy, new tastes and "Geographical Indication-food origination", local foods are started to redesigning by food industry. Couscous is one of them, which is the world-wide known traditional cereal product, today. Its popularity has been increasing, recently. Especially, in the Western market, it is prepared due to its taste, rapid preparation and usage in salads (tabbouleh). There are three couscous types such as Turkish, African and pasta-like depending on the formulation, processing technique and usage. Pasta-like couscous is widely produced by pasta companies by using same pasta production line by changing the die of press. Couscous commonly produced by using semolina and sorghum in Africa and Asia, however in Turkey, traditional Turkish couscous is generally prepared by coating of bulgur granules with semolina, wheat flour; egg and water or milk. In the literature, studies have recently been made for enrichment of couscous by either substitution of semolina with legume flours and other grain flours or adding nutritious ingredients to the composition. Worldwide, total exportation and importation quantity of couscous are 124, 481 and 126, 799 tons in 2016, respectively. Nowadays, the need for easy prepared meals increased due to the fast lifestyles and people are more aware about the importance of nutritionally valued products and its benefits to health. Therefore, further studies should be made to produce nutritionally enriched products with fast cooked property to improve the quality properties without the forgetting old tastes.

1 Keywords: couscous, pasta-like, african, enriched.

NESCO started a new indication to preserve the tradition and taste comes from ancient. Therefore, "UNESCO-Creative City Network" based on gastronomy is a new issue to protect the traditional foods. Additionally, there is a big trend for "Geographical Indicated" of foods and other products overall the World. Each culture starts to re-discover their products. Bordeaux wine, Antep bulgur, bread, baklava and some other most popular products are some of "Geographically Signed" food products, and day by day the number of products dramatically increases.

Couscous is a world-wide known traditional cereal product, which is a staple food of North Africa (Aboubacar and Hamaker, 2000;Rahmani and Muller, 1996) and Middle East cuisines. It can be consumed as salad (tabbouleh) and side dish with chicken U Pasta-like couscous is generally produced mechanically by using pressing technology **??**Çelik et al., 2004). Also, pasta-like couscous is widely produced by pasta/macaroni companies in same pasta production line by changing the die of press. The basic industrial and traditional African couscous processing steps are: a) mixing and agglomeration of Triticum durum semolina with water, b) steaming to precook, c) drying to preserve (Aboubacar et al., 2006;Debbouz and Donnelly, 1996) **??** d) cooling, e) grading to separate by size and f) storage or packaging (Dick and Matsuo, 1988). Wheat flour, semolina, sorghum, millet, maize (Galiba et al., 1988), bulgur flour (Yuksel et al., 2017;Yüksel et al., 2017;Yüksel et al., 2018) and barley (Kaup and Walker, 1986) can be used in the couscous production.

African and pasta-like couscouses were studied by Debbouz and Donnelly (1996) whom compared home-made, commercial and extruded couscous samples. Rahmani and Muller (1996) investigated thiamin and riboflavin contents of nine couscous samples (five traditional and four commercial) during preparation. In another study, the effects of different textures and types of endosperm on the production of couscous were observed by Galiba et al. (1988). Industrial quality (manufactured in Algeria) three durum wheat semolina were used as raw materials for the agglomeration of couscous experiments by Lefkir (2017).

Different flour additions to African and pastalike couscous were also studied. Yuksel et al. (2017) and Yuksel et al. (2017) investigated the effects of bulgur flour (undersize bulgur) addition on the quality, sensory and texture properties of couscous. The effect of different decortications levels of sorghum kernel on couscous quality was also studied by Aboubacar et al. (2006). Sidibe (1981) presented a paper in a conference about comparison of couscous yields of different varieties of sorghum grains. Couscous produced with sweet potato was studied by **??**pomasse (2014). In the study of Opata (2007), fifteen varieties of water yam were used to produce fries, couscous and flour. Besides, technological feasibility to obtain glutenfree couscous based on rice -leguminous supplementation was studied by Benatallah et al. (2008).

2 II. Economic Value of Couscous

In terms of worldwide import quantity of couscous, Turkey ranks one hundred nineteenth between the years of 2012 to 2016. However, Turkey ranks forty-second in the list of exporters. Quantity of exported couscous decreased from 268 to 231 tons in 2016. Exportation of pasta and couscous is made from Turkey to Iraq, Japan, and United Arab Emirates etc. In Figures. **??** and 2, the importer and exporter of first fifteenth countries in the world are given and the data was obtained from Trade Map . Worldwide, total exportation and importation quantity of couscous are 124,481 and 126,799 tons, respectively. Italy, France and Morocco exported couscous in 2016, in terms of quantity 37281, 34809 and 22113 tons, respectively. France ranks first in importers list with 31,436 tons and followed by United Kingdom, Belgium and United States of America with 16763, 8597 and 6870 tons in 2016, respectively. In the first quarter of 2017, Turkey ranks third for exported quantity of couscous after France and United States of America . According to Union of Organizations of Manufactures of Pasta Products of E.U., about 14.3 million tones pasta (including couscous) is produced worldwide in 2015 (Anonymous, 2015). In Turkey, the production of pasta quantity has been increased to 1315 thousand tons in 2015 (Anonymous, 2014) and in terms of worldwide production quantity, Turkey ranks third after Italy and United States (Anonymous, 2015). On the contrary, the consumption quantity of pasta in Turkey is lower than other countries (7.5 kg per person per year). Wheat semolina is generally used as raw material in traditional couscous production. Durum wheat (Triticum durum) is the second -most widely cultivated wheat species after hard wheat (Triticum aestivum L.). Due to its extra-hard, translucent, light-color properties, it is mainly ground to make semolina for pasta and couscous (Gazza et al., 2011).

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Ash content of durum semolina indicates the bran content. The ash in commercial durum semolina is normally ranges from 0.55 to 0.75 %. The protein content In modern life, need of easy and fast prepared, precooked and ready-to-eat, or ready-to-eat with the addition of small amount of hot water foods is increased. Besides the faster preparation, people are more aware that the nutritional value of a food product should be high. Therefore, higher protein and ash contents of bulgur are highlighting the economic and possible health benefit of milk, egg and bulgur containing enriched couscous.

Further studies especially on enriched couscous are required to evaluate and improve its nutritional and sensory properties. Studies should be concentrated on the production of functional and/or gluten-free couscous, which can be a different and nutritious option for pasta or noodle.

About couscous industry and market, the production technology should also be developed. Increase in consumption of traditional couscous will force the industry to produce couscous having traditional properties. Because, pasta-like couscous do not have big interest in contrast to traditionally produced couscous. Therefore, as a recommendation; couscous in industry should be produced at high capacity by using modern technology to obtain same specification with traditional ones.

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[1] [2]

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	Nutrient	Unit	Value per 100 g	1 Cu = 173
	Proximates			
	Water	g	8.56	14.8
	Energy	kcal	376	650
	Protein	g	12.76	22.0
	Total Lipid (Fat)	g	0.64	1.1
	Carbohydrate, by Difference	g	77.43	133
	Fiber, Total Dietary	g	5	8.7
Year 2018	Minerals Calcium, Ca	mg mg	24	42
	Iron, Fe		1.08	1.8
	Magnesium, Mg	mg	44	76
Volume XVIII	Phosphorus, P Potas-	mg mg mg mg mg mg mg mg mg	170	294
Issue I Version	sium, K Sodium, Na		166	287
I	Zinc, Zn Vitamins Vi-		10	17
	tamin C, Total Ascor-		0.83	1.4
	bic Acid Thiamin Ri-		0	0
	boflavin Niacin Vitamin		0.163	0.2
	B-6		0.078	0.1
			3.49	6.0
			0.11	0.1
(D D D D) L	Folate, DFE Vitamin	µg	20 0	35
	B-12	µg		
	Vitamin A, RAE	µg	0	0
	Vitamin A, IU	IU	0	0
	Vitamin D (D2 + D3)	µg	0	0
	Vitamin D	IU	0	0
	Lipids			
	Fatty Acids, Total Saturated	g	0.117	0.2
	Fatty Acids, Total Monounsaturated	g	0.089	0.1
	Fatty Acids, Total Polyunsaturated	g	0.252	0.4
	Cholesterol	mg	0	0

As mentioned previously, bulgur, egg and milk mixture are traditionally used as ingredients in Turkish couscous production. Bulgur is a whole grain product, which is generally produced from Triticum durum wheat by cleaning, cooking, drying, tempering, debraning, milling, polishing (optional) and size classification (

100 g. Its dietary fiber content is 3.5, 6.8, and 4.3 times greater than rice, wheat flou whole wheat bread, soybean and pasta, re (Bayram and Öner, 2007; Y?ld?r?m et al. The protein contents of egg and milk are g 100 g-1 (Çelik et al., 2004), respectively they are rich in Na (sodium), K (potassiu (calcium). Turkish couscous produced wit eggs have 11.04 and 11.27 % of protein, 0 % of ash, 3.13 and 4.16 % of dietary fiber (Çelik et al., 2004). In another study, Yül

Figure 1: Table 1 :

.1 Acknowledgement

This study was supported by 1002 -Short Term R&D Funding Program of The Scientific and Technological Research Council of Turkey (TUBITAK) (Project No: 115O117).

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