

Composition and nutritional value of traditional rural Iranian foods

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مكونات الأغذية التقليدية في الريف الإيراني وقيمتها الغذائية

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خلاصة : قُلِّمًا أُجريت دراسات على مكونات الأغذية التقليدية وقيمتها الغذائية في أرياف جمهورية إيران الإسلامية . وفي هذه الدراسة محاولة لجمع معلومات من هذه الأغذية من خلال استبيان طبقه العاملون الصحيون في المناطق الريفية بشمال البلاد وجنوبها وشرقها وغربها وأوسطها . وتم تحديد 24 من الأغذية الريفية والأطباق المركبة لهذا الغرض . وتبين أن اشكينه - دانه وأب - بانه يحتويان على مستوى مرتفع من الطاقة والبروتينات على التوالي من بين الأغذية النباتية والمختلطة (النباتية والحيوانية) . وكانت كثافة الطاقة ونسبة البروتين إلى الطاقة فيهما عالية جدا . ووجد أن محتوى الكالسيوم مرتفع نسبيا في أب - بانه ، ولكن محتوى الاثنين من الحديد كان منخفضا . وكانت بذور الشام هي المكون الرئيسي في اشكينه - دانه ، كما كان الجوز المحلي هو المكون الرئيسي في أب - بانه .

ABSTRACT There are a limited number of studies available on the composition and nutritional value of traditional rural foods in the Islamic Republic of Iran. In this study, an attempt was made to collect information on these foods through a questionnaire by health workers in rural areas of northern, southern, eastern, western and central regions of the country. A total of 24 traditional rural foods and composite dishes were identified. *Eshkeneh-daneh* and *ab-baneh* contained high energy and protein contents among plant and mixed (plant and animal) foods, respectively. Their energy density and protein-energy ratio were very high. The calcium content was relatively high in *ab-baneh*, but the iron content rather low in both. Melon seed in *eshkeneh-daneh* and local nuts in *ab-baneh* were the main ingredients in these composite dishes.

Composition et valeur nutritive de l'alimentation iranienne traditionnelle dans les campagnes

RESUME Il existe un nombre limité d'études disponibles relatives à la composition et à la valeur nutritive des aliments traditionnels dans les campagnes en République islamique d'Iran. La présente étude constitue une tentative pour recueillir des informations sur ce type d'aliments à l'aide d'un questionnaire qui a été distribué par les agents de santé dans les régions septentrionale, méridionale, orientale, occidentale et centrale du pays. Au total, 24 aliments et plats composés traditionnels des campagnes ont été recensés. Parmi les aliments végétaux et mixtes (composés de produits d'origine végétale et animale), *eshkeneh-daneh* et *ab-baneh* avaient, respectivement, une valeur énergétique et protéinique élevée. Leur densité énergétique et le taux protéine/énergie étaient très élevés. *Ab-baneh* présentait une teneur en calcium relativement forte, mais l'un et l'autre présentaient une teneur en fer plutôt faible. Les graines de melon dans *eshkeneh-daneh* et les noix locales dans *ab-baneh* constituaient dans ces plats composés les principaux ingrédients.

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Introduction

The varied climate in the Islamic Republic of Iran makes possible production of a range of food items throughout the country, particularly in rural regions. The ability of people in these regions to feed themselves depends to a large extent on the availability of local foods of both plant and animal origins. In the northern regions there is high potential for producing rice and livestock, as well as fish. The climate in the rest of the country is mainly dry, suitable for the production of cereals (mainly wheat and legumes), with limited livestock and fish production, except the southern parts where a main product is seafood.

Food choice and dietary patterns of families, both in urban and rural areas, depend not only on geographic region, but on socioeconomic and cultural factors, as well as on family size and distribution matters, such as transport and storage, throughout the country [1,2]. To make a better choice, the consumer should have a good knowledge of the nutritional value of individual foods, as well as of meals and dishes locally available. As the nutritional knowledge of the population increases, the food purchasing and distribution patterns of families could be improved [3,4].

There is limited information on the types and nutritional value of local foods and traditional meals in the rural areas of the country [5-7]. Therefore, it is very useful to formulate guidelines to help food planners at the district level and community health workers involved in teaching mothers, children and the community at large about the value of their traditional foods. In order to formulate guidelines, it is essential first to identify the traditional foods and composite dishes in each region, and then to classify them according to nutritive value [8,9]. A traditional local food was de-

finied as "a specific food in a region whose raw materials are locally available and which is not used in other regions". The purpose of this study was to determine the composition and nutritional value of traditional rural Iranian foods.

Materials and methods

Data on recipes of composite dishes were collected using a pretested questionnaire. The interviewers were village community health workers (*behvarz*) who interviewed mothers under supervision of a nutritionist. The objectives of the project were explained to the community health workers at the beginning.

Eleven provinces in the south, north, east, west and centre of the country were included in the study. The nutritive composition of individual food items and composite dishes were determined using the national food composition tables [7]. In addition, the energy densities and protein-energy ratios of all the composite dishes were calculated.

Results

Table 1 shows the 24 traditional rural composite dishes collected and their ingredients. Most dishes contain ingredients of both a plant and animal origin. *Kashk* is a dried dairy product popular mainly in rural areas.

The nutritive composition of the traditional food is shown in Tables 2 and 3. The highest protein and fat contents among plant foods were found in *eshkeneh-daneh* (Table 2). Calcium and iron contents were highest in *changal* and *bonash*, the iron content of *eshkeneh-daneh* also being as high as in *changal*. The fat content in the

Table 1 Ingredients of traditional rural composite Iranian dishes in five regions

Composite dish	Region	Ingredient (%)	Origin	
			Plant	Mixed
<i>Ab-baneh</i>	East	Nut (wild pistachio ^a) <i>kashk</i> ^b (25), green vegetable (12)		x
<i>Abgousht-pesteh</i>	Centre	Nut (pistachio) (25), meat (45), garlic (3), onion (5), potatoes (22)		x
<i>Arosheh</i>	Centre	Milk (85), curd cheese (2), flour (13)		x
<i>Ash-ardeh</i>	South	Ardeh ^c (11), rice (35), pulses (9), vegetable oil (1), green vegetable (22)	x	
<i>Ash-tamr-i-hindi</i>	Centre	Pulses (7), meat (29), sugar beet (23), tamarind (41)		x
<i>Bonash</i>	Centre	Green vegetable (75), pulses (14), onion (4), vegetable oil (7)	x	
<i>Bozghormeh</i>	East	Meat (16), <i>kashk</i> (65), pulses (8), potatoes (6) vegetable oil (5)		x
<i>Changal</i>	West	Bread (45), sugar (27), vegetable oil (10), green vegetable (18)	x	
<i>Chekdermeh</i>	North	Meat (28), rice (60), aniseed oil (8), onion (4)		x
<i>Eshkeneh-daneh</i>	East	Melon seed (63), vegetable oil (5), onion (4)	x	
<i>Ghalieh-mahie</i>	South	Fish (54), garlic (1), onion (5), green vegetable (20), flour (4), aniseed oil (8) tamarind (5)		
<i>Gazrak-polo</i>	Centre	Carrot (55), rice (33), vegetable oil (2), onion (10)	x	
<i>Joshireh-gousht</i>	East	Meat (29), <i>kashk</i> (7), pulses (60), flour (2) onion (2)		x
<i>Kachie</i>	West	Rice (42), vegetable oil (17), flour (41)	x	
<i>Kal-joush</i>	West	<i>Kashk</i> (29), walnut (24), aniseed oil (23), onion (12), garlic (12)		x
<i>Kal-kabab</i>	North	Aubergine (5/), walnut (14), tomatoes (1/), garlic (5), nut (pistachio) (4)	x	
<i>Kash-kash</i>	West	Offal (23), pulses (22), garlic (12), vegetable oil (8), onion (5)		x
<i>Kashile</i>	West	Flour (42), aniseed oil (14), honey (41)		x
<i>knatab</i>	west	Eggs (3), rice (14), vegetable oil (1), flour (28), pulses (9), green vegetable (42) onion (3)		x
<i>Mast-joush</i>	Centre	Eggs (8), yoghurt (68), flour (3), green vegetable (5), vegetable oil (3), onion (13)		x

Table 1 (concluded)

Composite dish	Region	Ingredient (%)	Origin	
			Plant	Mixed
<i>Mirzaghaseemi</i>	North	Aubergine (57), eggs (10), tomatoes (23), vegetable oil (5), garlic (5)		x
<i>Trafatee</i>	West	Rice (38), eggs (12), pulses (25), green vegetable (25)		x
<i>Tarkhines</i>	West	Wheat (37), <i>doogh</i> ^d (63)		x

^a Pistacio mutica

^b Dried dairy product

^c Sweet sesame cake

^d Diluted yoghurt

Table 2 Approximate composition of cooked traditional rural composite dishes (of plant origin) per 100 g

Composite dish	Protein (g)	Fat (g)	Carbohydrate (g)	Fibre (g)	Ash (g)	Iron (mg)	Calcium (mg)
<i>Ash-ardeh</i>	7.0	8.3	37.1	1.4	1.6	3.1	45
<i>Bonash</i>	5.5	7.8	11.4	1.2	2.4	3.3	91
<i>Changal</i>	5.1	10.9	59.9	0.9	1.9	5.0	141
<i>Eshkeneh-daneh</i>	14.8	30.9	17.6	1.8	2.7	4.9	58
<i>Gazrak-polo</i>	2.5	2.0	32.5	0.9	0.6	2.1	23
<i>Kachie</i>	6.9	17.5	66.7	0.7	0.5	1.9	25
<i>Kal-kabab</i>	2.7	5.7	8.9	1.5	0.7	0.8	25

plant foods was not high, except for *eshkeneh-daneh* with over 30% fat. The highest protein content in foods of mixed (plant and animal) origin was in *bozghormeh*, which contained high protein sources such as meat, pulses and *kashk* (Table 3). *Kal-joush* had the highest fat content. *Arosheh*, *mirzaghaseemi* and *kashile* had the lowest protein content. The calcium and iron contents of *ghalieh-mahie* were the highest, due to the high fish content of the food. *Ab-baneh* and *abgousht-pesteh* had the highest fibre content (Table 3).

The nutritional value of the foods studied in terms of energy and protein density (as qualitative indicators) are shown in Tables 4 and 5. *Kachie*, *eshkeneh-daneh* and *changal* were more energy-dense than other plant foods, but the protein content (grams per 100 kilocalories of food) and the protein-energy ratio of foods like *bonash* and *eshkeneh-daneh* were higher than those of the others (Table 4). Similar results were shown for animal foods. The most energy-dense foods were *kal-joush*, *bozghormeh*, *chekdermeh* and *ab-baneh*,

Table 3 Approximate composition of cooked traditional rural composite dishes (with ingredients of both plant and animal origin) per 100 g

Composite dish	Protein (g)	Fat (g)	Carbohydrate (g)	Fibre (g)	Ash (g)	Iron (mg)	Calcium (mg)
<i>Ab-baneh</i> ^a	39.3	12.9	23.7	3.2	6.2	6.3	280
<i>Abgousht-pesteh</i>	14.5	14.5	9.8	4.1	1.2	2.3	39
<i>Arosheh</i> ^a	4.6	3.6	15.9	0.1	0.9	0.7	17
<i>Ash-gilagheh</i>	15.6	4.1	22.2	1.0	2.3	5.02	07
<i>Ash-tamr-i-hindi</i>	9.7	2.2	32.2	2.5	1.8	2.9	48
<i>Bozghormeh</i>	51.0	11.0	10.9	0.3	6.0	2.02	90
<i>Chekdermeh</i>	8.6	12.6	49.5	0.5	0.7	3.4	4
<i>Ghalieh-mahie</i>	15.1	9.6	7.7	0.6	16.6	23.9	865
<i>Joshireh-gousht</i>	22.9	6.4	38.4	2.3	2.7	5.41	37
<i>Kash-josh</i> ^a	23.8	35.3	9.5	0.4	14.8	1.21	52
<i>Kal-kash</i>	16.4	9.6	23.1	1.1	1.4	3.1	47
<i>Kashile</i>	4.3	17.0	67.6	0.4	0.4	0.8	12
<i>Khatab</i>	7.6	2.2	40.5	1.2	1.0	3.1	75
<i>Mast-joush</i>	5.3	6.2	11.1	0.4	0.8	1.6	77
<i>Mirzaghasemi</i>	2.7	6.3	5.0	0.7	0.7	0.9	20
<i>Trafatee</i>	10.3	2.9	47.4	1.1	1.4	3.9	0
<i>Tarkhineh</i> ^a	5.4	1.1	27.6	0.6	0.8	3.5	65

^a Dishes include only dairy products, such as milk, kashk and *doogh*

Table 4 Nutritional value of cooked traditional rural composite dishes (of plant origin)

Composite dish	Energy		g/100 kcal	Protein Protein/energy
	kcal/100 g (kJ/100 g)	Density kcal/g (kJ/g)		
<i>Ash-ardeh</i>	250 (1045)	2.5 (10.45)	2.8	11.3
<i>Bonash</i>	137 (573)	1.4 (5.73)	4.0	16.0
<i>Changal</i>	357 (573)	3.6 (14.92)	1.4	5.7
<i>Eshkeneh-daneh</i>	407 (1701)	4.1 (17.01)	3.6	14.5
<i>Gazrak-polo</i>	157 (656)	1.6 (6.56)	1.6	7.0
<i>Kachie</i>	448 (1873)	4.5 (18.73)	1.5	6.2
<i>Kal-kahab</i>	100 (418)	1.0 (4.18)	2.7	11.0

Table 5 Nutritional value of cooked traditional rural composite dishes (with ingredients of both plant and animal origin)

Composite dish	Energy		Protein	
	kcal/100 g (kJ/100 g)	Density kcal/g (kJ/g)	g/100 kcal	Protein/energy
<i>Ab-baneh</i>	352 (1471)	3.5 (14.71)	11.1	44.4
<i>Abgousht-pesteh</i>	173 (723)	1.8 (7.23)	8.1	32.4
<i>Arosheh^a</i>	114 (477)	1.1 (4.77)	4.0	16.0
<i>Ash-gilagheh</i>	187 (782)	1.9 (7.82)	8.3	33.2
<i>Ash-tamr-i-hindi</i>	175 (732)	1.8 (7.32)	5.3	21.2
<i>Bozghormeh</i>	343 (1434)	3.4 (14.34)	14.9	59.6
<i>Chekdermeh</i>	344 (1438)	3.4 (14.38)	2.5	10.0
<i>Ghalieh-mahie</i>	174 (427)	1.7 (7.27)	6.7	34.0
<i>Joshireh-gousht</i>	302 (1262)	3.0 (12.62)	7.6	30.4
<i>Kal-joush^a</i>	446 (1864)	4.5 (18.64)	5.3	21.2
<i>Kash-kash</i>	246 (1028)	2.5 (10.27)	6.7	26.8
<i>Kashile</i>	421 (1760)	4.2 (17.60)	1.0	4.1
<i>Khatab</i>	212 (886)	2.1 (8.86)	3.6	14.4
<i>Mast-joush</i>	120 (502)	1.2 (5.02)	4.4	18.0
<i>Mirzaghasemi</i>	103 (431)	1.0 (4.31)	2.6	10.4
<i>Trafatee</i>	256 (1070)	2.6 (10.70)	4.0	16.0
<i>Tarkineh^a</i>	142 (594)	1.4 (5.94)	3.8	15.2

^a Dishes include only dairy products such as milk, kashk and doogh

while foods with the highest protein-energy ratio were *bozghormeh* and *ghalieh-mahie*, *abgousht-pesteh* and *ab-baneh* (Table 5).

Discussion

The nutritive composition and the nutritional value of traditional animal and plant foods show that their quality and quantity are different and that there are a few foods which can provide most of the nutrients that the body needs. For example, *esh-keneh-daneh*, among all foods of plant origin, had a high energy and protein content,

and its calcium and iron contents were also acceptable, although the bioavailability of these two important minerals is not known and needs further investigation. The main constituent of this dish is melon seeds. Foods like *bozghormeh*, *ab-baneh* and *kal-joush* are the most appropriate foods on the basis of their protein content and energy density. The food items in *bozghormeh* include meat, *kashk*, pulses, potatoes and vegetable oils. The ingredients of *kal-joush* and *ab-baneh* are *kashk*, nuts, vegetables and vegetable oils. Nuts are locally available: walnut for *kal-joush* and wild pistachio for *ab-baneh*. They are a valuable

source of protein and vegetable oil in the diet.

The other traditional foods had different energy and nutrient contents. For example, some foods, such as *bonash*, *arosheh* and *tarkhineh*, had a low energy and protein content, but the ratio of protein to energy in the diet was suitable (Tables 2–5).

Conversely, foods like *changal* and *kachie* had a high energy content, while their protein density and protein–energy ratio were much lower. Therefore, the nutri-

tive value of each food as well as its protein–energy ratio should be determined. In other words, in addition to the quantitative aspects, qualitative aspects should also be taken into consideration [10].

Acknowledgement

The authors would like to thank Dr A. Djazayeri for his valuable comments in the preparation of this article.

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