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## Recipe calculation of six Iranian egg-based dishes (KuKu)

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### Abstract

Nutrient content of six Iranian egg-based dishes (KuKu) was estimated by recipe calculation method. Kuku dishes were prepared by mixing vegetables and herbs such as cauliflower, eggplant, green beans, green herbs and leafy vegetables, potatoes, and zucchini with eggs and seasonings through frying both sides over low heat. Proximate composition of 100 g edible part of dishes was: 45.22 - 75.61 g Water, 1.54 - 2.10 g Ash, 4.84 - 6.98 g protein, 12.28 - 37.78 g total fat, 3.83 - 17.75 g carbohydrate, 1.3 - 3.82 g dietary fiber, 0.62 - 4.64 g total sugar, and 148.18 - 391.54 Kcal energy. The dishes also contain 307.01 - 463.17 mg sodium, 1.79 - 3.67 g saturated fat, 0.22 - 0.81 g trans-fat, and 99.64 - 173.77 mg cholesterol. Cooking yield factors of dishes were between 0.48 and 0.86.

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### 1. Introduction

It is evident that the quality of food composition data is excessively effective on the precision of nutrient intake measurements<sup>1</sup>. Margo N. Woods argues, “Knowledge of the nutrient content of foods is also the basis for nutrient food labeling and standards for food companies”<sup>2</sup>. There are several reliable food composition tables or databases on the nutrient content of raw and cooked common ingredients, which are freely accessible and can be discussed and referred to, in researches such as Canadian Nutrient File (CNF) database<sup>3</sup>, USDA National database<sup>4</sup>, and FAO Food Composition Tables<sup>5-9</sup> but the data on the nutrient content of many locally eaten mixed dishes around the world, such as kuku, is unavailable. Kuku, also known as Kookoo (Persian: کوکو), is a Persian and Azerbaijani genre of cuisine. It is a vegetarian dish, made with whipped eggs, which then are folded in with various ingredients<sup>10</sup>. Furthermore,

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Chemical analysis of mixed dishes is an expensive and time-consuming procedure, so nutrient and energy content of cooked foods are usually estimated by recipe calculation methods<sup>11</sup>. Weight and nutrient content of ingredients may undergo some changes during preparation and cooking process of the food, which could be adjusted by applying yield factors and nutrient retention factors. Nutrient content of recipes may be estimated by summing of raw ingredients method, ingredient method, total recipe method or mixed method (yield at recipe level and nutrient retention at ingredient level)<sup>12</sup>. Moreover, in this research, nutrient content of six Iranian egg-based dishes (known as “Kuku”) have been calculated by mixed method.

## 2. Materials and Methods

Nutrient content of 100 g edible portion of six Iranian egg-based dishes (*KuKu*) have been calculated based on the composition of edible part of ingredients. Raw ingredients were mostly purchased from local stores, but vegetables, especially green herbs, were bought fresh from Persian stores. Weight of cooking oil, additives such as salt and spices, and wheat flour were measured by measuring spoons, which 1 Tbsp. canola oil was considered equal to 14.2 g, 1 tsp salt 6.1 g, 1 tsp black pepper 2.1 g, 1 tsp saffron 0.7 g; 1 tsp baking soda 4.7 g, 1 tsp turmeric 2.2 g, and 1 cup wheat flour 132.1 g<sup>3</sup>. Recipes of Kukus, especially the proportion of the main ingredients have been adopted from the *Honare Ashpazi* cookbook<sup>13</sup>. Kukus were prepared by mixing vegetables and herbs such as cauliflower, eggplant, green beans, green herbs and leafy vegetables, potatoes, and zucchini with eggs and seasonings. Then mixtures of ingredients were added to a non-stick pan containing hot oil and were fried over low heat, until kukus were cooked under (about 10 minutes each side). Pan was covered by lid during the cooking process. Cooking yield factors (YFs) have been measured by dividing the total weight of edible part of cooked food to the total weight of edible part of raw ingredients (except for cauliflower, green beans and potato) and have been applied in recipe level. Cooked weights of cauliflower, green beans and potato were used as edible part in cooking yield factor calculation of Kukus. Excess oil in frying steps in preparation of dishes were removed and discarded, so the edible portion of cooking oil represents the amount of oil in gram, which was absorbed by ingredients during the cooking process. Data for nutrient content of all ingredients except for cooked green beans and (Tareh) *Allium ampeloprasum ssp persicum*<sup>†14</sup> has been extracted from the online Canadian Nutrient File (CNF). Nutrient content for cooked, green beans without salt has been extracted from USDA nutrient database. Since the information about the nutrient content of *Allium ampeloprasum ssp. Persicum*, was not available, nutrient content of Leek, leaves, raw (*Allium porum L (A. ampeloprasum L.)*) has been extracted from Food Composition Tables for the Near East, FAO<sup>7</sup>, and has been used in green herbs Kuku nutrient content calculation. Retention factors (RFs) have been extracted from the USDA Table of Nutrient Retention Factors, which have been applied at ingredient level<sup>15</sup>. Based on the Preparation method of each dish, nutrient retention factors have been applied for each step of cooking process. For example If onion has been fried twice, first time as an ingredient, and second time in final mixture, nutrient retention factors were applied two times for frying of this ingredient. The whole procedure including preparation, cooking, calculating YFs and analyzing nutrient contents of each dish was carried out in duplicate, and results have been reported as mean values.

### 2.1. Recipes

#### Cauliflower Kuku Recipe:

Ingredients	AP <sup>‡</sup> (g)	EP <sup>§</sup> (g)	Ingredients	AP (g)	EP (g)
1 medium Cauliflower	893	614 <sup>**</sup>	1/2 tsp black pepper	1.05	1.05
6 Large Eggs	354	304	1/8 tsp saffron	0.0875	0.0875

<sup>†</sup> (Tareh) *Allium ampeloprasum ssp persicum*<sup>†</sup> (14)

<sup>‡</sup> As purchased

<sup>§</sup> Edible portion

<sup>\*\*</sup> Boiled, drained, with salt

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