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TRIP REPORT:

Assessment on Nutrition Related to Anemia in Ferghana Oblast

Author:

Dr Gaukhar Abuova

**February 21 – March 7, 2001
Ferghana Oblast, Uzbekistan**



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I. Abstract

Anemia caused by inadequate nutrition is a particular problem in the Ferghana Valley region of Uzbekistan, and is especially prevalent among young females of adolescent and fertile age. There appear to be a number of reasons for nutritional inadequacies including low incomes, problems with geographical access to different types of food, and traditional roles played by men and women. This report assesses the nutritional intake of the female rural population and makes a number of recommendations for improving nutrition among this population group. In addition the report gives a detailed account of the typical diet of the female rural populace in the Ferghana Valley. It also includes a lengthy appendix with tips and recommendations for a healthy and nutritious diet, which has been adapted by the author to take account of the nutritional defects present in the valley, with specific reference to the problems of anemia.

II. Executive Summary

Anemia caused by inadequate nutrition is a particular problem in the Ferghana Valley region of Uzbekistan, and is especially prevalent among young females of adolescent and fertile age. There appear to be a number of reasons for this lack of nutrition including low incomes, geographical access to different types of food, and traditional roles played by men and women. This report assesses the nutritional intake of the female rural population and makes a number of recommendations for improving nutrition among this population group.

The assessment is based on conversations with residents, plus information from nutrition journals compiled by Peace Corps volunteers, focus group discussions and healthcare providers. From these sources the author ascertained a number of facts about female nutrition. Firstly that women tend to eat two main meals a day, plus breakfast and a light snack. The basic staple foods appear to be rice, pasta, French beans, mung beans, sorghum and bread, with bread making up the bulk of the diet. Secondly, although most families have access to dairy products, their intake of such foods is insufficient because dairy products represent an important source of income in this low-income area. Thirdly, women tend to eat very little meat – an average of 15 to 25 grams a day. This appears to be both because meat is expensive, and because distribution of meat in families starts with elder men, then younger men, then children, then elder women and finally younger women. When meat is eaten it tends to be fatty meat, and when it is prepared it is usually by stewing and frying with added oils. Fourthly, fruits tend to be eaten only when in season, although they are supplemented out of season by dried fruits. The author also found that the local population drinks a large amount of tea with every meal, which is problematic. They also tend to use too much salt, and this is generally non-iodized.

The author also ascertained that nutrition amongst young children appears to be a cause for concern. Specifically, there is not enough understanding or practice of the importance of exclusive breastfeeding for the first six months of a child's life. Subsequently, many mothers give their children tea before two years of age and others do not introduce meat, which is rich in iron, at an early enough age.

The report gives a detailed account of the typical diet of the female rural populace in the Ferghana Valley. As a result of the assessment and information collected, the author recommends that a number of measures be taken to improve nutritional intake. Firstly, the author recommends holding a WHO training seminar for oblast healthcare specialists and NGO representatives on "Healthy Nutrition in the Family (Nutrition for Pregnant and Lactating Women, Young Children and One-Year Olds)" in order that they can further promote important nutritional recommendations to help prevent such things as anemia. Secondly he recommends widespread dissemination of a list of tips for healthy nutrition as basic literature for promotion of healthy nutrition. These tips are substantial and have been adapted specifically for the Ferghana Valley by the author. They are attached in an annex to the report.

III. Introduction

Dr. Gaukhar Abuova, a nutrition consultant from Almaty, Kazakhstan, assessed the typical diet of the female rural population in the Ferghana Oblast between February 21 and March 7, 2001 in order to make nutrition related recommendations.

A. Specifics of the Diet of Rural Women in the Ferghana Oblast

These observations were collected through personal conversations with residents of 13 villages, two towns (Ferghana and Kokand) and through information from nutrition journals compiled by Peace Corps volunteers in 25 different rural families, focus group discussions, and healthcare providers.

It is typical for rural women of this region to eat two main meals (lunch and dinner) a day, along with breakfast and 1-2 snacks*. In summer and fall the snack is eaten instead of lunch. Basic staple foods in rural residents' diet are rice, pasta, French beans, mung beans, sorghum, and bread. Peas and buckwheat are used less frequently. Bread makes up the essential part of the diet and is usually the main product used in snacks (about 250 grams per intake).

Dairy products are accessible for most rural families because they have cows. The population prefers sour milk products. Traditionally *katyk* (sour milk) is added to soups (1-2 tablespoonfuls) and *suzma* (curd-like mass) is added to second courses (3-4 tablespoonfuls). In hot seasons people drink *ayran* (beverage made out of *suzma*), during other seasons they drink *katyk*. These products are made out of both skimmed and whole milk. Whole milk is sometimes used for breakfast with bread or when cooking milk soups. However, intake of milk and dairy products is insufficient to satisfy minimal nutritional requirements since most of these products, along with fruits and vegetables, are sources of income.

Meat, in this region, is categorized as a product that directly depends on the financial abilities of families because they do not produce meat themselves and hence need to buy it. In accordance with existing nutrition habits the rural population consider flour, vegetable oil, rice, tea, sugar, vegetables, and only then meat to be priority foods. In addition, distribution of meat in families begins with men, elderly parents, elder sons, and finally women and younger children. Moreover, as a rule, men eat additional meat dishes at *chaihbanas* (traditional gathering places for men - "a tea-house"). On average, women eat 15-25 grams of meat, or none at all.

The population favors fatty meat and tail-fat. Nearly all national recipes require the use of fatty meat. The meat is then fried and stewed with added oils (usually vegetable oil or animal fats: oleo oil, mutton fat, tail-fat or *kaymak* (cream rich in fat (usually 60 percent)) + vegetable oil in a 1:1 ratio). Even soups are cooked with fried meat (*kaurma*). People think that heavy farming is an indication for eating fatty foods. Another source of excess fat in the diet of the rural population is *kaymak*. In rural areas of the Ferghana Oblast, women tend not to eat fish either (while it is available in urban areas).

All recipes for both soups and second courses always include onions, carrots, tomatoes (or tomato paste), fresh (or preserved) sweet peppers, and greens when in season. However, in late winter and in spring, when vegetable supplies are exhausted and people have to purchase them, very few vegetables are included in their diet. Second courses are usually eaten with salads*. The most widespread salad is *shakarop* (onion, tomato and cucumber salad), greens (in summer and fall); radish +\- carrots (in winter and spring), sauerkraut, tomatoes, cucumbers, vinaigrette (in winter). The spring diet of women in Ferghana is enriched with onion and garlic sprouts, red radish and greens (shepherd's purse, mint, dandelion, shamrock, spinach, sorrel, coriander) used in cooking *manty* (steamed large dumplings) and *samsa* (meat patty).

Fruit is eaten between meals. When in season, (in summer and in fall) the population tend to eat enough fruit (apples, pears, pomegranates, quinces) with an average of 500-1000 grams daily. During spring and

winter, consumption of fresh fruit is limited to 100 grams, and then only occasionally. During this period dried fruits (raisins, dried apricots, dried cherry-plums, and dried apples) are readily available.

Every meal is accompanied by tea (green or black), which is taken just before, during, or immediately after the meal. The average is 200-300ml (1-2 cups) per intake.

The population use unlimited amounts of salt (generally non-iodized salt). They are also used to consuming purified sugar (in jams). If low-income families attempt to limit sugar intake, then it is the adults who do not eat it and who give the sugar to their children since they consider this product to be one of the main elements of child nutrition.

Nutrition in the urban population is similar to that of rural people, differing only by consumption of more meat, dairy products, and sweets. Their diet is enriched by the following dishes: meatballs, cutlets, *manpar* (soup with pieces of boiled dough), *naryn* (thinly sliced flattened boiled and oiled dough mixed with thinly sliced boiled beef or horsemeat), boiled chickpeas, patties, *cheburek* (small flat fried meat pie), doughnuts, pancakes, and milk porridge made out of different kinds of groats: semolina, oatmeal, peeled barley, and millet. In addition, the diet is even richer due to intake of fish cheese, *brynza* (cheese-like sour milk product usually made out of sheep milk), cottage cheese, sour cream, mayonnaise, condensed milk, sausages, bakery products and confectionary: *halvah* (sweet dish made out of nuts, sugar and oil), cookies, cakes, pastries, sweet pies, and sweets.

One of the main problems related to child nutrition during the first year of life is absence of exclusive breastfeeding until the baby is six months old, although this occurs more frequently in rural areas than in cities. Another problem is inopportune introduction of complementary nutrition (if breastmilk is abundant then mothers tend not to introduce other foods until the baby is one year old); tardy introduction of meat (by the time the baby is one year old) and use of tea. In rural areas, regular food cooked for a family is used for complementary nutrition; nothing special is cooked for children at this age. Nutrition of young children (> 5 years old) differs from the nutrition of rural women only by increased amounts of sugar.

The nutrition of pregnant and lactating women tends to be the same as the nutrition of non-pregnant and non-lactating women.

B. Typical Diet of the Rural Populace in the Ferghana Oblast (Women)

Breakfast:

- Green/black tea (sometimes with milk) + sugar/jam + *non/patyr* + *kaymak*/butter
- Milk + bread

Lunch\dinner: soups or second courses with *non/patyr* + green/black tea

Soups:

- Fried soups (potato)
- *Lagman* (rich noodle soup)
- *Lovia osbi* (cooked French beans)
- *Mashburda* (rice+French beans and/or mung beans)
- *Mash ugura* (mung beans+noodles)
- *Mash kovak* (mung beans+pumpkin)

- *Ugura* (noodles)
- Soup with pasta/macaroni
- *Chuchvara shurva* (soup with ravioli)
- *Kucha* (soup made from *jubora* (sorghum))
- *Mastava* (rice soup)
- *Sut ash* (milk soup with pumpkin)
- *Borsch* (cabbage soup without beets and with tomato paste)

Second course:

- *Karam dulma* (stuffed cabbage) *kovatok dulma* (stuffed grape leaves)
- *Jarkop*: fried potatoes with meat, vegetables, and +\ - quince
- *Dymlama* (potatoes stewed with vegetables, meat and vegetable oil +\ - quince)
- *Shavlya* (rice porridge (pilaf) with vegetable oil, meat, and vegetables +\ - dried fruits)
- *Loviya shavlya* (rice porridge + French beans)
- *Shovlya* (rice + offal + onions + vegetables)
- *Moshkichary* (rice porridge + mung beans)
- Pasta with meat and vegetables, stewed with vegetable oil
- *Manty* or *samsa* with vegetable oil and/or fat-tail/butter/melted butter/*kaymak* added to stuffing that consists of pumpkin + onions; meat + onions; potatoes, cabbage; greens (herbs: *momakaymok* (dandelion), shamrock, *shura* (goose-foot, orach), *at kulak* (shepherd's purse), *yalpiʒ* (mint), coriander, etc.) potatoes + onions
- Fried potatoes
- *Katlama* (fried pie stuffed with meat and vegetables or greens)
- *Osh* (pilaf) - 1 kg of rice + 1 kg of carrots + 0.3 kg of onions + meat + 0.3 ml of vegetable oil +\ - quince
- Buckwheat/pasta pilaf
- *Piona*: fried beets + radish + onions + dried fruits

Snacks:

- *Non* + grapes/raisins + tea
- *Non* + greens/cucumbers/tomatoes + tea
- *Non* + milk

- *Non* + *kaymak* + \- greens + tea
- *Non* + greens
- *Non* + sugar + tea
- Fresh fruits: grapes, plums, peaches, apricots, wild apricots, quinces, figs, apples, pears, pomegranates, persimmons, lemons (used more frequently by people suffering from hypertension), strawberries, sweet cherry, sour cherry, cherry-plums, melons, water melons
- Dried fruits: apples, wild apricots, peaches, figs, apricots, mulberries + tea

Salads:

- *Shakarop*: tomatoes + cucumbers + onions + sweet pepper + greens + salt
- Radish + red carrots + onions + salt, black pepper, chili pepper
- Radish + carrots + onions + greens + salt
- Carrot salad (vegetable oil, garlic, vinegar, chili pepper)
- *Bakbrom* salads: red radish + coriander + dill + garlic sprouts + onion sprouts + chili pepper + *katyk* (sour milk)
- Onions and garlic sprouts
- Dill, coriander, basil, parsley
- Green radish
- Red radish + onions
- Greens (coriander, dill) + *suzma*
- Vinaigrette (French beans + sauerkraut + boiled beets + onions + cucumbers + potatoes + boiled carrots + vegetable oil)
- Sauerkraut + onions

Beverages:

- Green or black tea + \- sugar \ jam, raisins
- Canned fruits with sugar (stewed fruits \ fruits compotes)
- Dried fruits boiled with sugar
- Extract of dried fruitss
- Extract of dried hips

Based on the above-mentioned diet, the nutritional risk factors for developing chronic illnesses in the region (anemia, ischemic heart disease, strokes, hypertension, obesity, billiferous tract disorders etc.) are:

- Excessive intake of:

- both vegetable and animal oil
- sugar
- salt
- Insufficient consumption of:
 - fresh fruits and vegetables in winter and spring
 - dairy and meat products

Assessment of the eating habits of the rural population allows the following causes for decrease in bioavailability of iron contained in food to be ascertained:

- significant limitations of meat and fish intake
- drinking tea with every meal
- insufficient amount of vegetables, fruits, greens, and sour milk products consumed with basic meals.

C. Recommendations

1. All activities related to education of the population should be implemented according to a unified sample (WHO standard). It is therefore important to conduct a WHO training seminar “Healthy Nutrition in the Family (Nutrition of Pregnant and Lactating Women, Young Children, and One-Year Olds)”. Training should, first of all, educate the leading specialist of the oblast’s healthcare system as well as representatives of NGOs involved in health promotion activities.
2. Use the recommendations “Tips on Healthy Nutrition” adapted by this consultant for the Ferghana Oblast as basic literature for promotion of healthy nutrition (see Annex 3). The "Recipes of National Dishes for People Suffering from Iron Deficiency Anemia" is an inaccurate report. This manual does not clearly state that the population should increase the bioavailability of iron contained in foods (See the ‘Recommendations on Nutrition Adapted for the Ferghana Oblast Populace "Tips on Healthy Nutrition"’ section "How to Prevent Development of Anemia").

In addition, the listed national dishes are outdated in accordance with healthy nutrition requirements, and are, in any case, similar to the population's current dietary habits. (See “Typical Diet of Rural People of the Ferghana Oblast”). As a result, the recommended meal plans pose the same risks to the population (excess fat, sugar) as those meals currently being consumed. It would, therefore, be erroneous to regard such a presentation as recommendations. The suggested daily iron requirement for women is presented in accordance with outdated former USSR standards and is incorrect (see page two). It is necessary to come up with recipes for making the following recommendations and to indicate portions necessary to improve iron absorption.

Salads:

- *Shakarop*: tomatoes + cucumbers + onions + sweet pepper + greens + salt
- Green radish + red carrots + onions + salt, black pepper, chili pepper
- Radish + carrots + onions + greens
- Carrot salad (vegetable oil, garlic, vinegar, chili pepper)
- *Bakbrom* salad: radish + coriander + dill + garlic sprouts + onion sprouts + chili pepper + sour milk

- Greens, radish, potatoes, onions, carrots, garlic, onions sprouts
- Onion and garlic sprouts
- Dill, coriander, basil, parsley
- Green radish
- Red radish + onions
- Greens (coriander, dill) + *suzma*
- Vinaigrette (boiled French beans + sauerkraut + boiled beets + onions + cucumbers + potatoes + boiled carrots + vegetable oil)
- Sauerkraut + onions
- Salad made out of dandelion leaves: 50 grams of finely cut young dandelion leaves + 5 grams (1 teaspoonful) of vegetable oil + 10 grams of fresh lemon juice.
- Salad: 30 grams of nettle leaves + 20 grams of primrose leaves + 20 grams of young dandelion leaves + 10 grams of onion + 30 grams carrots + 20 grams of horse-radish
- Grate or mince onions, carrots, and horseradish, add 50 grams *katyk* (*suzma*), mix everything with herbs and lay the salad out on a plate.

It is also necessary to develop recipes for the following beverages to be used instead of tea by the population:

- Wild apricot\peach\fig + boiled water
- Stewed dried fruits
- Beverage made out of hips: pour boiling water over dried hips and infuse.

Annex 1: Work Schedule

Wed, February 21	Fly Almaty to Tashkent.
Thurs, February 22	Fly Tashkent to Ferghana and meet with Ferghana office staff to find out what is already known about nutrition habits in Ferghana. Fieldwork around Ferghana Oblast - mostly rural areas but a few urban areas.
Fri, February 23	Visit Kuva Rayon, kishlaks: Tarken (5 households), Kalyn posty (13 households), Terak Tagi (3 households).
Sat, February 24	Visit Bagdat Rayon, kishlaks: Churendi (3 households), Shurkishlak (5 households) Kirkiboldy (10 households). Meeting with head of the NGO Unsinay's Center for Social Support of Women in Bagdat Rayon (Manzira Kadirova)
Sun, February 25	Akhun-Babaev: bazar Kunteliy and Margulan, Kuntipa (8 households), Hotin Arik (7 households), Toch - Alibabay.
Mon, February 26	Besharik Rayon: kishlaks: Ittifok (10 households), Aingi (5 households), Kazak Korgan (4 households).
Tues, February 27	Meeting with Experts from Medecins Sans Frontieres (MSF) - Manfred Oostveen (Nurse\ Health Educator); meeting with NGO's: chief hematologist in the Ferghana Oblast (Mahmud Hasan), Head of Center for Reproductive Health (Chadisha Nazarova), Head of Association of Rural Health Care Centers (Okyl Sadykov), Head of Center for Healthy Lifestyles (Gulnar Sadykova). Write preliminary report.
Wed, February 28	City of Kokand: Meeting with women in the city polyclinic (15 respondents). Visit bazaars, food stores.
Thurs, March 1	City of Ferghana: Meeting with 2 women in the city. Visit bazaars, food stores.
Fri, March 2	Meeting with Peace Corps Volunteers. Write recommendations for nutrition (of general population).
Sat, March 3	Work with focus groups (adult men and health workers) conducted by ZdravPlus in Sochsky Rayon, kishlak "Shachimordon". Compile a short list of foods and beverages rich in absorbable iron and appropriate for the general population.
Sun, March 4	Departure to Tashkent.
Mon, March 5	Debrief at Abt office in Tashkent; meeting with Prof. Bakhrarov and Prof. Fazilov.
Tues, March 6	Write special recommendations for nutrition of pregnant and lactating women, young children, particularly infants of weaning age.
Wed, March 7	Fly Tashkent to Almaty.

Annex 2: Scope of Work:

1. Review existing data/information about nutrition in Uzbekistan and Ferghana, particularly:
 - Nutrition journals compiled by Peace Corps volunteers in Ferghana;
 - Results of focus groups conducted by *ZdravPlus*;
 - 1991 Uzbekistan cookbook with iron-rich recipes;
 - *ZdravReform* booklet on anemia prepared for healthcare providers.
2. Identify foods and beverages that can provide a balanced, nutritious diet, with a special emphasis on iron-rich foods. These foods must be readily available in rural areas of Ferghana and acceptable and affordable to the population. It is anticipated that this will entail visits to bazaars in different parts of Ferghana and discussions with individuals to ascertain the availability and acceptability of foods.
3. Advise project staff on the appropriateness of the 1991 cookbook in light of current international standards and the availability of foods in Ferghana. If the cookbook is appropriate, suggest any changes that may be needed to bring it into line with international standards.
4. Develop the following lists of foods and beverages:
 - A short list of foods and beverages (or food combinations) that are rich in absorbable iron and appropriate for the general population;
 - Special recommendations for iron-rich foods/beverages for pregnant and lactating women and young children, particularly infants of weaning age;
 - A short list of foods, in food groups, that can form the basis of a nutritious diet for the general population.

All foods on these lists must be readily available in rural areas of Ferghana and acceptable and affordable to the population.
3. Provide periodic advice via e-mail, phone and fax as the campaign is developed, and review materials and messages to ensure that they are technically correct.
4. Provide a brief report in English or Russian on activities undertaken while in Uzbekistan, key people met and the food/beverage lists developed. This report must be presented in draft form prior to departure from Uzbekistan and submitted in final form not later than 10 days after departure from Uzbekistan.

Annex 3: Tips on Healthy Nutrition

«Food is one of the greatest joys of life!»

Everything you eat should be useful and nutritious!

Everything that is useful and nutritious should be tasty!

Nutrition is only adequate when a person receives the sufficient proteins, fats, carbohydrates, vitamins, and minerals necessary for development and functioning of the body and for maintaining good health. Both shortage and excess of nutrients can lead to various diseases.

How can one ensure an adequate balance of nutrients in one's food? First of all, by eating a diverse range of products since no products can, on their own, provide the body with all necessary nutritious elements. For instance, a lemon is rich in vitamin C, but it does not provide iron, whereas French beans are rich in iron but they do not supply vitamin C. Healthy foods should include various products in the correct ratio and amounts.

Learn to correctly organize your daily diet using the adapted model offered by the World Health Organization:

Your daily ration should include the five main groups of staple foods in the portions indicated below:

Group I: Bread, Cereal, and Potatoes (6-11 portions)

Eat bread, groats, rice, pasta or potatoes several times daily.

This group will provide you with more than half your daily energy because these products contain little fat and significantly contribute to intake of proteins, starch, dietary fiber, some minerals (calcium, iron), and vitamins (vitamin B1, niacin, B6). The high content of dietary fiber helps to avoid constipation.

Try to consume all the products that are available in this range of grain and starchy products daily.

There is an erroneous belief that people gain weight from eating potatoes, pasta, and bread. In reality these starchy foods do not lead to obesity *if they are cooked without oil*. If you are overweight, you should have 6 portions of foods in this group, and conversely, if you are underweight or if you engage in intensive physical activities it is imperative that you increase the number of portions to up to 11 a day.

Size of One Portion:

- 1 piece of bread, *non, patyr* (30-40 grams)
- 1\2 a small roll
- 1 small bagel
- 3 ring-shaped cracknels (*soosbikas*) or small crackers
- 1\2 cup (100 grams) of boiled porridge (rice, sorghum, buckwheat)
- 1\2 cup (100 grams) of boiled pasta
- 1 medium-sized potato (about 100 grams)
- 3\4 (about 30 grams) of ready-made dry breakfast

Group II: Fruits and Vegetables (5-9 portions)

Eat different fruits and vegetables several times daily, preferably fresh, locally produced ones (not less than 400 grams, except for potatoes).

Consume adequate amounts of fruits and vegetables all year round and you will provide your body with the necessary vitamins (vitamin C, group B vitamins, and carotinoids) and minerals (potassium, magnesium, calcium, and iron). Fruits and vegetables are the main sources of folic acid; adequate consumption of these helps to prevent damage of the nervous tube of the fetus and megaloblastic anemia. Therefore, women who are planning to become pregnant or those who are pregnant should consume products rich in folic acid: red beans, green French beans in pods, soy beans, lentil, peas, peanuts, spinach, cabbage, cauliflower, and broccoli. Red carrot and pumpkin should be preferred to yellow kinds because they contain more carotinoids (which give vitamin A.)

Fruits and vegetables in combination with rye flour, oatmeal, and legumes, provide the body with soluble dietary fibers that affect cholesterol and sugar metabolism in the blood. Moreover, they absorb and remove heavy metal salts and pesticides thus preventing cancer, especially intestinal and breast cancers. Along with insoluble dietary fibers (wheat flour, bread) they regulate bowel movement.

Fruits and vegetables provide the body with antioxidants: vitamin C, carotinoids, vegetative sterines and flavonoids that prevent many chronic illnesses. One of the factors causing high prevalence of cardiovascular and some types of cancer in the region (of GIT and reproductive organs) is inadequate consumption of fruit and vegetables.

It is therefore recommended to eat as much fruit and as many vegetables as possible in order to provide for a sufficient amount of different substances with protective functions. Eat up to 3-5 portions of vegetables and 2-4 portions of fruit, preferably fresh, a day. Consumption of frozen, dried and preserved fruits and vegetables is, however, also useful.

Preserve vegetable (tomato) and fruits (apple, grape...) juices, dry berries and fruits. When you use preserved or processed fruits and vegetables, choose those that contain less fats, vegetable oils, sugar and salt.

Size of One Portion:

- 160 ml fruit and vegetable juice
- 1\2 cup of (about 100 grams) boiled and fresh vegetables
- 1 cup of leafy vegetables (spinach, lettuce, cabbage, onion sprouts, dill, parsley)
- 1 medium-sized tomato, cucumber, sweet pepper (100 grams)
- 1 medium-sized fruit (100 grams)
- 1\2 cup (about 100 grams) of fresh berries, dried, fresh frozen, preserved or boiled fruit

Group III: Meat, Fish, Eggs, and Legumes (1-3 portions)

Substitute fatty meat and meat products for low fat beef, mutton, poultry, fish, or French beans, lentil, peas, and mung beans.

Meat, fish, eggs, and legumes (French beans, peas, mung beans) are the main sources of proteins and IRON.

Every day we receive sufficient protein from a number of different products. However, iron deficiency anemia is one of the main health problems facing people in our republic. These products – rich and valuable sources of iron – must therefore be consumed daily. You should remember that iron in legumes

is absorbed well only when they are consumed in combination with lean meat or fish, vitamin C fortified foods (fruits and vegetables), fermented milk or sauerkraut (see details in the section on how to prevent anemia).

Small portions of meat, fish, eggs, and legumes should be eaten on a daily basis. Pregnant and lactating women, and adolescents should eat 3 portions. For others, especially for the elderly, 1 portion a day is sufficient.

Taking into consideration the high prevalence of iron deficiency anemia in the region, it is imperative that the population has at least 1 portion of meat (70-80 grams) or fish (100 grams) a day!

The population tends to consume excess fat (saturated fats) from fatty meat and meat products which leads to infarctions, strokes, obesity, and diabetes. Such fats are also present in dairy products (*kaymak*, butter), bakery products (cookies, cakes, etc.), and cooking fats (oleo oil and mutton fat). In order to increase the iron content in the diet it is better to use lean meat, skinned poultry, fish and liver. Lard and tail-fat are *pure saturated fats*. They are not necessary parts of the diet!

Size of One Portion:

- 70-80 grams of cooked meat or 100 grams of fish
- 2 eggs
- 1-1.5 cups (150- 200 grams) of boiled beans (French beans, peas, mung beans)
- 2/3 –1 cups (100-150 grams) of nuts

Group IV: Milk and Dairy Products (2-3 portions)

Use milk and dairy products low in fat and salt (ayran, katyk, suzma, kurt (small dry white sour balls made out of suzma and salt)).

These foods contain many nutrients, especially protein, calcium, and vitamins A, D, and B (B₂, B₁₂). However, these products also contain a great deal of saturated fats and are therefore valuable for adults only when skimmed or half-skimmed (*katyk, ayran, suzma*).

Accordingly, it is essential to replace *kaymak* or cream with milk and sour dairy products (*katyk, ayran, suzma*). Using lightly salted cheese (*pyshlak*) and *kurt* instead of salting *suzma* and *ayran* should be encouraged. The recommended daily amount is 2 portions of dairy products daily. Pregnant women and adolescents should eat 3 portions in order to provide an adequate intake of calcium necessary for development of good bones and teeth.

Sizes of One Portion:

- 1 glass (220 ml) of whole or skimmed milk, *ayran* or *katyk*
- 45 grams of hard cheese (size of a matchbox)
- 1.5 cups (250 grams) of cottage cheese, *suzma* or home-made cheese

Group V: Fats, Oils, and Sugar (the less the better)

Eat foods that are low in oil, sugar, and fats. Eat less purified sugar and jam, and limit the number of sweet beverages and sweets.

Fat of any origin (animal or vegetable) should be consumed as infrequently as possible because excess consumption of fat leads to atherosclerosis, obesity, and a number of cancerous illnesses. Excess fat in

our bodies results from consumption of fatty meat, fried or stewed with fat, or oily dishes (plov, fried meat and vegetables, etc.), *kaymak*, butter, mayonnaise and confectionery.

Try to minimize intake of fats. You can achieve this through boiling, steaming, grilling, and baking food. Always prefer lean meat, and low fat dairy products. Do not cook soups where the meat is fried prior to being boiled (*kaurma* soups). Thinly spread butter/*kaymak* over a slice of bread, and limit the consumption of mayonnaise, ice cream, cakes, cookies, sweet corn sticks, halva, wafers, etc.

Try to reduce intake of sugar (jam, honey, candy, etc.) since they only contain “empty calories” and very few nutrients. The complete exclusion of these foods from your diet will not pose any health risk. Moreover, the benefits will be obvious. Consumption of sugar in any form leads to obesity, dental caries, and contributes to the development of atherosclerosis of the blood vessels. Cut down on making jams and fruits compotes.

Size of One Portion:

- 1 teaspoonful of *kaymak*, butter, or margarine
- 1 teaspoonful of cotton or vegetable oil
- 1 tablespoonful of mayonnaise
- 3 teaspoonfuls of sugar
- 1 teaspoonful of honey or jam
- 1 chocolate bar (about 60 grams)
- 1/2 piece of cake

Choose food with low salt content. The total amount of salt consumed daily should not exceed one teaspoonful (6 grams) per person, including salt contained in bread, preserved, pickled, dry-cured, and smoked products. Use only iodized salt.

The amount of salt used in cooking should be reduced, and herbs and spices should be used to add flavor to dishes instead. You should not salt food without tasting it first.

Do not drink tea or coffee during meals (do not drink tea for at least two hours after food intake)! Tannins in tea and coffee inhibit iron absorption from the foods that you eat.

Food Groups

Group I: Bread, Cereal and Potatoes (6-11 portions are recommended)

Groats: rice (5 kinds), buckwheat, sorghum (*jubara*)

Bread: Non, *patyr*, *piyaz non* (flat round cake made out of yeast dough and onions), *jizxon non* (yeast dough + fried pieces of fat-tail + dried tomatoes + onions), *kok shelpok*, corn flat cakes (*jubara non*)

Sumalak (wheat germ)

Pasta, *rojki* (horn-shaped pasta), vermicelli, noodles

Potatoes

Group II: Fruits and Vegetables (5-9 portions are recommended)

Vegetables:

Fresh – cabbage, yellow and red carrots, tomatoes, cucumbers, red radish, radish, turnip, sweet pepper, eggplants, red and orange pumpkin, garlic, corn, greens (parsley, dill, coriander, onion sprouts, garlic sprouts, oregano (*tog raykbon*), shepherd's purse (*jak-jak*), young dandelion leaves (*momakaymok*), shamrock (*sebarga*), quinoa (*shura*), radish leaves, beet-tops, horse sorrel (*at kulat*), mint (*su yalpi*), spinach (*sumlak*), dioecious nettle (*kechitki ut*, *chayan ut*, *gazanda*).

Preserved foods: sauerkraut, pickled tomatoes, cucumbers, eggplants, vegetable salads, tomato juice, tomatoes + sweet pepper + garlic + greens, tomato paste.

Fruits:

Fresh – grapes, plums, peaches, apricots, wild apricots, quince, figs, apples, pears, pomegranates, persimmon, lemon, strawberries, sweet cherry, sour cherry, cherry plum, mulberry, melon, and watermelon.

Dried – apples, wild apricots, peaches, figs, apricots, cherries, cherry plums, plums, and mulberries.

Preserved fruit (compotes)

Spices: black pepper, chili pepper, caraway (*kora zira*), coriander (*kashnich*), *djambu*, barberry, dried coriander, dill, dried sweet pepper, tomatoes, sesame.

Group III: Milk and Dairy Products (2-3 portions are recommended)

Milk, *katyk*, *ayran*, *suzma*, *pishlak* (homemade cheese), *kurt*

Group IV: Meat, Fish, Eggs, Legumes, and Nuts (1-3 portions are recommended)

Beef, mutton, chicken, duck meat, liver, kidneys, tongue, offal, *kbayp* (type of sausage where cleaned animal intestines are filled with ground kidney, spleen, liver, etc. and rice).

Chicken and duck eggs.

French beans (white and red), mung beans, and peas.

Nuts: walnuts, peanuts, almond, pistachios.

Group V: Fats and Sweets: (2-3 portions are recommended)

Fats: butter, melted butter, *kaymak*, and vegetable oil: cotton, soy, sunflower, mutton and oleo oils, tail-fat.

Sweets: sugar, sugar candy, jam, *paravarda*, *pechak* (types of national candy), candy, chocolate, shinny (thick grape syrup), cookies, wafers, *bolhaetar* (flour fried with vegetable oil + sugar)

Table for Evaluation of Diet

Analyze your typical daily diet (24 hours).

Count each « Yes» as 1 point, and each «No» as 0.

DID YOU EAT ...

1. At least 5 portions from the bread and cereal group? (350 grams) «_____»
2. At least 5 portions from the fruit and vegetable group? (400 grams) «_____»
3. 2-3 portions from the milk and dairy products group? «_____»
4. 2 portions from the meat, fish, eggs, legumes, and nuts group? «_____»
5. Not more than 2-3 portions from the fats and sweets group? «_____»
6. Various staple foods from each food group? «_____»
7. At least 2 portions of fresh vegetables? «_____»
8. At least 1 portion of fresh vegetables? «_____»
9. Did you have a nutritious snack? «_____»
10. Did you eat low-fat food? «_____»

Total Score:

Excellent - 10 points:

Congratulations! The excellent result shows that you have a well-proportioned diet.

Good - 8-9 points:

You have the right idea about healthy nutrition. Some changes need to be made to your diet to move you to the “excellent” category.

Satisfactory - 4-7 points:

There are certain areas where your food choices may need to be altered. Once again - look carefully at which diet categories should be altered.

Risky - 3 and less:

You are running risks with such a diet. Try to change your eating habits. Do not try to change everything at once. Make the changes step by step. Refer to ‘Tips on Healthy Nutrition’ and decide what changes you should start with.

How to Prevent Anemia!

Iron deficiency anemia results from inadequate intake of iron from foods. Why does this happen and how can one ensure a balanced diet to prevent the development of such pathology?

Iron is contained in almost all the staple foods that we consume. However not all iron found in food can be absorbed by the small intestine. What does this depend on?

Iron bio-availability varies to a great extent in different foods. Good sources of iron are meat and fish. A considerable amount of iron, called heme iron, is contained in the above-mentioned products and is easily absorbed by the body. Nevertheless, one should remember that excessive cooking (both time and temperature) decreases the iron content in these products by 5-25 percent; long storage decreases the iron content by 17-51 percent, and deep-freezing by 15-20 percent.

The other type of iron is non-heme iron, which is found in cereal (bread, groats, pasta), fruit and vegetables, dairy products, and eggs. However, iron extraction is limited because these products contain iron binding components or inhibitors. The latter include phytates contained in cereal, groats, and nuts; calcium and phosphates in whole milk and cheese; phosphoproteins and ovoalbumens in eggs; and oxalin acid in spinach and green beet tops.

Eating fruits and vegetables containing vitamin C and organic acids; meat and fish; sour dairy products; and sauerkraut weakens the effect of these inhibitors.

In addition, the content of phytates in groats and cereal can be reduced by soaking, frying, greensprouting or fermenting (by adding yeast) these foods.

Meals should include a number of different staple foods which when used in combination improve iron absorption. To achieve this it is necessary to follow the following combinations in cooking: I + II + III or I + II, or I+II +III, or II + III where I – meat/fish; II – French beans/peas/mung beans/rice/sorghum/pasta/potatoes; III – fruits/vegetables.

Combination I+II+III will allow for the best results to be achieved.

The population of the Ferghana Oblast should be encouraged to do the following when preparing main meals (lunch/dinner):

- Make a main course (soups/second courses) with a sufficient amount of vegetable salads * and *suzma* (with second courses) or *katyk* (with first courses).
- Increase amount of meat (70-80 grams) or fish (100 grams) consumed daily for women of the region, especially pregnant and lactating women, adolescents, and young children.
- Eat French beans, peas, mung beans, and sorghum rather than rice and pasta
- Eat fruit and berries as desserts after the main course in addition to consuming them at intervals between meals.
- Eat more greens (dill, parsley, coriander) with meals.

It should be noted that tea and coffee considerably inhibit iron absorption because the tannins in them bind the iron to form insoluble complexes. Consequently, tea should be drunk between meals, but not for two hours after eating the main course. During meals, the following beverages should be drunk: preserved fruits with low sugar content (compotes), compotes made out of dried fruits (without sugar), extracts made out of dried fruits (wild apricot, peach), extracts made out of dried hips, homemade fruit and vegetable juices (tomato, apple, grape juices), and boiled water.

Iron Content in Staple Foods

(milligrams per 100 grams of edible parts)

Staple Foods	Iron Content (mg)	Influence of dietary factors on iron absorption
Cow liver	7.0	do not influence
Sheep liver	7.5	do not influence
Chicken liver	9.5	do not influence
Pig liver	13.8	do not influence
Cow kidneys	7.2	do not influence
Sheep kidneys	3.5	do not influence
Cow heart	4.9	do not influence
Sheep heart	3.6	do not influence
Cow tongue	4.9	do not influence
Sheep tongue	1.8	do not influence
Beef	2.1	do not influence
Mutton	1.6	do not influence
Horse meat	3.3	do not influence
Rabbit meat	1.0	do not influence
Chicken meat	0.7	do not influence
Turkey meat	0.6	do not influence
Fisha–sazan (carp)	0.9	do not influence
Mackerel	0.8	do not influence
Sardine	1.4	do not influence
Egg (1)	1.9	* influence
Red French beans	6.4	* influence
White French beans	7.6	* influence
Peas (chick peas)	5.5	* influence
Mung beans	2.8	* influence
Sorghum	4.0	* influence
Corn	2.8	* influence
Buckwheat	3.0	* influence
Rice	0.8	* influence
Wheat flour	1.2	* influence
Apples	0.1	* influence
Quince	0.3	* influence
Apricot	0.5	* influence
Apricot (dried)	4.1	*influence
Fig	0.3	*influence
Fig (dried)	4.2	*influence
Peach	0.4	*influence
Peach (dried)	6.8	*influence
Grapes	0.3	*influence
Raisins	3.8	*influence
Prunes	2.9	*influence
Spinach	2.1	*influence
Parsley	7.7	*influence
Dill	9.5	*influence
Mint	9.5	*influence
Peanuts	2.1	*influence
Walnuts	2.9	*influence
Almonds	3.0	*influence
Sunflower seeds	6.4	*influence
		*influence

* dietary factors influence absorption: They stimulate absorption when consumed in combination with:

Meat, fish, liver
Vegetables and fruits, juices (vitamin C and organic acids: citric, tartaric, and malic acids)
Meat/fish/liver + vegetables and fruits, juices
With sour milk products: <i>ayran, kатыk, suzma</i>
Sauerkraut
Inhibit iron absorption when used with:
Tea or coffee
Whole milk

Vitamin C Content in Staple Foods

(per 100 grams of edible parts of products)

Staple Foods	Content of vitamin C (mg)
Liver	13
Apples	6
Quince	15
Pomegranate	13
Peach	31
Pear	6
Grapes	3
Plums	4
Raspberry	32
Strawberry	77
Melon	17
Watermelon	8
Carrots	6
Cucumbers	2
Tomatoes	17
Young potatoes	16
Old potatoes	11
Cabbage	49
Radish	17
Red radish	17
Onion sprouts	77
Garlic	17
Pumpkin	14
Beets	5
Spinach	26
Parsley	190
Mint	31
Sweet pepper	120

Products Rich in Organic Acids

Carrots, potatoes, beets, pumpkin, broccoli, tomatoes, sauerkraut and fresh cabbage are rich in citric, malic, and tartaric acids.

Sour dairy products are rich in lactic acids.

Nutrition of Pregnant and Lactating Women

Nutrition of pregnant and lactating women should be based on the principle mentioned in the main text. There is an erroneous belief that pregnant and lactating women should eat for two people.

The demand for iron in pregnant women is not much greater than for a non-pregnant woman. In the last three months of pregnancy, pregnant women should eat an additional 200-300 kilocalories daily. That is roughly 3 slices of bread or 1.5 glasses of milk. A lactating woman needs a little more – 400-500 kilocalories daily - which can partially be covered by fat reserves accumulated during pregnancy.

No specific additions are therefore required to the diet. The daily diet should include the five food groups:

Group I: Bread, cereal, and potatoes, 6-11 portions recommended. Number of portions depends on the initial weight of the woman before pregnancy. If she was overweight, then she should have 6 portions and if she was underweight, then 11 portions.

Group II: It is recommended that pregnant women eat 5-9 portions of fruits and vegetables daily. They should eat at least 3 portions of vegetables and 2 portions of fruits on a daily basis and prefer fresh fruits and vegetables. Remember that adequate development of the fetus requires a sufficient amount of vitamins and minerals that are ingested from this group of foods. Dark green, bright yellow, and orange vegetables are the best source for vitamin A, most fruits are rich in vitamin C (citrus, currant, strawberry, hips (dog-rose berries)) and they also provide folic acid – red French beans, green French beans in pods, soy beans, lentils, peas, nuts (peanuts), spinach, cabbage, cauliflower, and broccoli.

Group III: Milk and dairy products provide the body with calcium, and vitamins A and B2. Accordingly, pregnant and lactating women, whose need for these micronutrients is increased, should try to have up to three portions of dairy products daily.

Group IV: Three portions of meat, fish, eggs, legumes, and nuts should be eaten daily. In order to prevent anemia, at least one portion of meat or fish is useful (70 –80 grams) as a source of well-absorbed iron.

Group V: Fats and sweets: it is recommended that the intake of products from this group is limited to two portions daily.

Control salt intake: it should not exceed 1 teaspoonful a day considering that it is contained in other products (bread, canned products, cheese).

Avoid drinking tea during meals. The best time for drinking tea is two hours after a meal.

Child Nutrition During the First Year of Life

Breastmilk is the ideal nutrition for a child because it provides all the necessary nutrients and protective substances that ensure a child's normal growth and prevent infections and allergies.

Before a child is six-months old milk *fully satisfies* all the child's physiological needs. Attempts to introduce complementary foods and beverages may decrease the amount of breastmilk produced.

During the child's second six-months, the child *needs* complementary nutrition with breastmilk. Timely introduction of complementary foods strengthens health, physical development, and prevents growth delay in children. This time is a time when serious nutrition disorders that could produce lifelong complications occur. Complementary nutrition should not replace breastmilk, which remains an important and main source of food for an infant.

The best time for introducing complementary nutrition is when the baby is *6 months* old. In some cases complementary foods are introduced at 4 months, however this is only in special cases when the baby is not putting on weight, is interested in other foods, and still looks hungry after breastfeeding. However, introduction of complementary foods should NEVER happen earlier than 4 months!

Ill-timed introduction of complementary nutrition has dangerous shortcomings:

When introduced too early:

- Complementary foods may replace breastmilk and this will decrease production of milk in the mother.
- The risk for intestinal disorders and allergies may increase due to immaturity of the intestinal tract.
- Infants become open to pathogens that might be present in food or water and this increases risk of illness.
- Traditional foods for complementary nutrition include thin soups and watery porridges that are lower in energy and nutrients than breastmilk.

When introduced too late (well after six months)

- Delay or absence of physical development as a result of inadequate supply of energy and nutrients from breastmilk.
- Increased risk of intestinal and respiratory illnesses as a result of the imbalanced nutrition status caused by inadequate supply of nutrients.
- Worsened iron deficiency anemia and iodine deficiency conditions resulting from an inadequate supply of vitamins and minerals in breastmilk needed for a growing organism.

Main Rules for Successful Introduction of Complementary Nutrition:

The time for feeds should be chosen during the day, when the baby is usually inclined to eat or hungry and when the mother is able to devote more time to her child. Before noon is preferable.

Any complementary nutrition should be fed slowly from a teaspoon; the amount should be gradually increased to the full volume. The mother should start feeding her baby with mashed semi-solids made from products available locally, for example, rice porridge or mashed potatoes. To make it easy for the child to get accustomed to eating new foods it is recommended that expressed breastmilk is added to the complementary foods. To prevent decreased production of breastmilk, complementary nutrition should be introduced after the baby is breastfed.

A second complementary feeding should be introduced *roughly 5-6 days after the first one* and the third feeding should be introduced roughly 5-6 days after the second introduction. During this period it is important to diversify staple foods used in your child's diet by introducing multi-component foods such as: meat + vegetables; meat + vegetables*+ groats; vegetables*+ cereal; vegetables* + fruits + cereal etc.

* including legumes: French beans, peas, lentils

Each feed should contain sufficient *energy and nutrients*. Energy is achieved through intake of adequate volumes and thickness of foods, the second is attained by use of variety of staple foods.

Complementary nutrition should be sufficiently thick so that the baby can be spoon-fed. Thick porridge can be softened with vegetable oil or butter/*kaymak* (increases calorie content); fruits and vegetables (to improve vitamin and mineral content); eggs, meat, fish, and legumes (French beans, peas, mung beans), or nuts (sources of valuable protein). It is useful to use the water in which vegetables, fruits or meat have been boiled.

It is important to remember that 100 kilocalories of animal foods usually contain nutrients such as vitamins A, D and E, riboflavin (B2), vitamin B12, calcium and zinc. Fruits and vegetables are rich in thiamin (B1), vitamin B6, folic acid and vitamin C. Because of all these nutritious elements in various foods, complementary nutrition should be diverse.

When choosing cereals, preference should be given to cereals *not containing gluten*. These are rice, buckwheat, sorghum, and corn. Wheat, semolina, barley, pearl barley, and oatmeal contain gluten.

Meat is a necessary nutritious dietary item for the first year of a child's life. Being a valuable source of iron, it prevents anemia. Meat should be introduced into a child's diet beginning at six-months of age in mashed form, then ground, and later it can be finely cut.

Low fat types of meat should be used for child nutrition, for instance beef, mutton, horse and chicken meat. Poultry needs to be skinned, other kinds of meat should be cleaned of fibers and fascia.

Whole undiluted cow's milk should not be used as a beverage until nine-months of age, although it may be used in porridges (diluted). If *sour dairy products* are introduced into a child's diet between six and nine months, they should be diluted on a 1:1 ratio. After nine months whole milk and dairy products should be used, not skimmed or undiluted.

Locally produced *fruits and vegetables* should be used; in addition, homemade juice and mashed fruits should be used where possible instead of manufactured ones. When fresh fruits are not in season then preserved, frozen, or dried fruits should be used if they are low in sugar and salt and if all safety rules have been observed in cooking them.

In cooking for children under three years of age there is no need to add *salt, sugar, or spices*. If family foods are used for the child's complementary nutrition then part of the food should be separated before sugar, salt, and spices are added.

The recommended *cooking techniques* are: boiling, stewing, roasting, grilling, microwaving, and baking.

A series of organoleptic factors may influence a child's consumption of complementary foods such as taste, flavor, appearance, and thickness of food. The process of introducing complementary nutrition depends on how the child is learning to enjoy new foods. Staple foods should be offered repeatedly since foods that are initially declined tend to be accepted later.

Age (months)	Thickness of Food and Rules for Introduction	Breastmilk and Supplements (from a cup or a spoon)	Dairy Products (from a cup or a spoon)	Other Liquids (from a cup or a spoon)
6	Start with 1-2 teaspoonfuls of liquid puree, gradually increasing the amount up to 5-12 teaspoonfuls per feeding	Breastfeeding on demand not less than 8 times per 24 hours Or adapted baby foods (formula)	Sour dairy products: <i>ayran, katyk</i> (diluted with water on a 1:1 ratio)	Clean boiled water
7-9	Grated and well-mixed food. Pieces of fruit to practice chewing	Breastfeeding upon request not less than 6 times per 24 hours or about 600 ml of adapted formula.	Cottage cheese, <i>suzma, ayran, katyk</i> (diluted with water according to 1:1 ratio), hard types of cheese	Clean boiled water, Well diluted juices Compotes without sugar
9-12	Ground food Slices of bread, dried crusts, pieces of fruit or vegetable	Breastfeeding on demand not less than 6 times per 24 hours or about 600 ml of formula.	1-2 types of dairy products daily: cottage cheese, <i>suzma</i> , whole milk; sour dairy products: <i>ayran, katyk</i>	Clean boiled water, different juices, compotes without sugar - about 6 times a day
SUGGESTIONS ON CHILD NUTRITION DURING THE FIRST YEAR OF LIFE				
Age (months)	Cereal, bread, pasta Potatoes	Fruit and vegetables	Meat, fish, eggs, and legumes	Food that should be avoided!
6	Cereal not containing gluten: rice, buckwheat, sorghum, corn Mashed potatoes	Mashed soft fruits: peach, wild apricots, apricots, apples, pears... Puree from cooked vegetables: turnip, carrots, cabbage (combination of different vegetables preferable)	Puree made out of low-fat beef, mutton, horse meat, chicken, turkey, peeled legumes	<i>Whole cow, goat and sheep milk; Eggs, nuts, seeds; Fruits juices and citruses; Fish and seafood; Semolina, peeled barley, wheat, oatmeal, rolled oats, rye cereal, barley flour, all kinds of tea (black, green, herbal). Foods recommended to be consumed from 7-9 and 9-12 months</i>
7-9	All kinds of cereal, pasta, dough, bread, dried crusts	Whole soft fruits: pieces of melon, apricots, peaches Slightly cooked and mashed vegetables: turnip, carrots, tomatoes, sweet pepper, onion sprouts, green peas	Ground boiled low-fat beef, mutton, horse-meat, liver, fish, chicken Peeled legumes; hard-boiled egg Nuts in the form of paste	<i>Whole cow, goat, or sheep milk as a beverage (only for porridges –half-diluted); adding sugar, honey; salt, spices; using soft cheese (only hard ones), whole nuts (only in form of paste), all kinds of teas (black, green, herbal). Foods recommended to be consumed from 9-12 months.</i>
9-12	All kinds of cereal, pasta, dough, bread (including bread made out of meal), dried crusts	Pieces of fresh fruit Slightly cooked vegetables	Boiled and finely cut low-fat beef, mutton, horsemeat, liver, fish, chicken, Peeled legumes, hard boiled eggs. Nuts in the form of paste.	<i>Diluted cow, goat, sheep's milk Sweet manufactured aerated and non-aerated drinks, sugar, sweets, candy, cookies; Salt, spices; all kinds of tea (black, green, herbal).</i>

* In case of food allergy and risk of allergy, the child's diet should be worked out individually under a pediatrician's control.

Annex 4: Key Nutrition Messages

The General Population

A healthy diet is based on a daily intake of as many phytogetic staple foods as possible, rather than on those of animal origin.

On a daily basis humans requires a certain amount of nutrients found in various foods to satisfy their nutritious needs. Only daily dietary intake of a variety of foods can provide all the necessary nutrients, namely proteins, fats, carbohydrates, vitamins, and minerals, since different foods are abundant in certain types of nutrients which the body lacks, and they can successfully replace this shortage. It should be noted that both a lack and excess of certain nutrients could be equally harmful for the body, so a healthy diet should be adequately proportioned.

All foods that one consumes can be classified into five basic groups 1) bread, groats, rice, pasta or potatoes; 2) fruits and vegetables; 3) meat, fish, eggs, and legumes (French (kidney) beans, peas, and mung beans); 4) milk and dairy products; 5) fats and sweets. Nutrition is considered to be diverse if all food groups are represented in one's daily diet. The recommended amount of each food product is different for each group; they are written in terms of portions for convenience. Thus, the daily diet should include:

- 6-11 portions of foods from the bread, groats, pasta or potatoes group:

Size of One Portion:

- 1 piece of bread, *non*, *patyr* (types of flat round cake) (30-40 grams)
- 1\2 a small roll
- 1 thin bagel
- 3 ring-shaped cracknels or two small crackers
- 1\2 cup (100gr.) of boiled porridge (rice, sorghum, buckwheat)
- 1\2 cup (100gr.) of boiled pasta
- 1 medium-sized potato (about 100 gr.)
- 3\4 (about 30 gr.) of ready-made dry breakfast

- 5-9 portions from the fruit and vegetables group:

Size of One Portion:

- 160 ml of fruit or vegetable juice
- 1\2 cup (about 100 gr.) of boiled or fresh vegetables
- 1 cup of green leafy vegetables (spinach, lettuce, cabbage onion sprouts, parsley)
- 1 medium-sized tomato, cucumber, sweet pepper (100 gr.)
- 1 medium-sized fruit (100 gr.)
- 1\2 cup (about 100 gr.) of fresh berries, dried, fresh-frozen, preserved or boiled fruits

- 1-3 portions from the meat, fish, eggs, and legumes (French beans, peas, mung beans) group:

Size of One Portion:

- 70-80 gr. of cooked meat or 100gr. of fish
 - 2 eggs
 - 1-1.5 cups (150- 200 gr.) of boiled beans (French beans, peas and mung beans)
 - 2/3 –1cups (100-150 gr.) of nuts
- 2-3 portions from the milk and dairy products group:

Size of One Portion:

- 1 glass (220 ml) of whole or skimmed milk, *ayran* (sour dairy drink) or *katyk* (fermented milk)
 - 45 gr. hard cheese (matchbox-sized piece)
 - 1.5 cups (250 gr.) of (cottage cheese, *suzma* or homemade cheese)
- 2-3 portions from the fats and sweets group:

Size of One Portion:

- 1 teaspoonful of *kaymak* (fatty cream cheese), butter, or margarine
- 1 teaspoonful of cotton or other vegetable oil
- 1 tablespoonful of mayonnaise
- 3 teaspoonfuls of sugar
- 1 teaspoonful of honey or jam
- 1 chocolate bar (about 60 gr.)
- 1/2 piece of cake

Watch your weight, the ideal body weight index (kg/square meter) should range from 18,5 to 24,9.

As mentioned in section one, you should eat as much as your body demands. Your weight is an indicator of whether or not you observe this rule. If the value of your weight with regard to your height is within permissible limits this indicate that you are neither undernourished nor that you overeat. If you eat 200 kilocalories less or more on a daily basis, you will either lose or gain approximately 5 kilos in a year.

People think that undernourishment threatens both health and life. In reality, obesity also poses a high risk for developing a number of chronic diseases. Modern nutritional science has proved that obese people develop cardio-vascular diseases, diabetes, musculoskeletal locomotor system disorders, biliferous tract disorders, gall-bladder, breast, uterine (especially during post-menopause period) and prostate cancers more frequently than non-obese people.

One should therefore watch his/her weight and adjust one's diet accordingly. Here, the weight-height indicator should be calculated according to the adequacy of weight to height or by Body Weight Index (BWI):

$BWI = \text{weight in kilograms} / (\text{height in meters})^2$

If your BWI is less than 18.5, then you are underweight, if it ranges from 18.5 to 24.9, then it is normal, if it varies from 25 to 30 then you are overweight, and if it is above 30, then you are obese.

For instance, if you weigh 64 kg and your height is 1.70 m., then your body weight indicator will equal to 22. Conclusion: your weight is normal.

Control Amount of Consumed Salt.

An adult's daily diet should include a maximum of 1 teaspoonful of salt (6 gr.), including salt in bread and preserved products. If you use salt you should give preference to iodized salt. Most people use twice as much salt as they need, thus increasing the risk of hypertension. Therefore, the amount of salt added to foods should be reduced; herbs and spices should be used instead to make food pleasant to taste. Do not add salt to dishes mechanically without tasting them. If you stop salting food and eating pickles then you will start tasting salt in preserved and cooked foods.

Pregnant and Lactating Women

1. Nutrition of pregnant and lactating women should be wholesome to satisfy the needs of the growing fetus and child. They need to consume healthy foods and their diets should be planned according to the general principle above.
2. Popular opinion stating that a pregnant woman should eat for two people is erroneous. The pregnant woman's demands are not so great, amounting only to an additional 200-300 kilocalories a day during the last three months, which is equal to 3 small pieces of bread and 1.5 glasses of milk daily. A lactating woman needs a little more, 400-500 kilocalories a day, which can be partially satisfied by fat that the woman accumulated during pregnancy.

So, in general, the daily diet of a pregnant woman does not require specific foods and should consist of the same five food groups as the general population:

Group I: Bread, grains, and potatoes, 6-11 portions are recommended. Number of portions depends on the initial weight of a woman before pregnancy. If she was overweight, then she should have 6 portions, and if she was underweight then she should have 11 portions.

Group II: It is recommended that these women have 5-9 portions of fruits and vegetables. They should eat at least 3 portions of vegetables and 2 portions of fruits on a daily basis and should eat fresh fruits and vegetables if possible. Remember that adequate development of the fetus requires a sufficient amount of vitamins and minerals that are ingested from this group of foods. Dark green, bright yellow, and orange vegetables are the best source for vitamin A, most fruits are rich in vitamin C (citrus, currant, strawberry, hips (dog-rose berries)) and they also provide folic acid – red French beans, green French beans in pods, soy beans, lentil, peas, nuts (peanuts), spinach, cabbage, cauliflower, and broccoli.

Group III: Milk and dairy products provide the body with calcium, vitamin A and vitamin B2. Accordingly, pregnant and lactating women, whose need for these micronutrients is increased, should try to increase their daily intake to up to three portions of dairy products.

Group IV: Three portions of meat, fish, eggs, legumes, and nuts should be eaten daily. In order to prevent anemia, at least one portion of meat or fish is useful (70 –80 grams) as a source of well-absorbed iron.

Group V: Fats and sweets: it is recommended that intake of these products is limited in this group to two portions daily.

Control salt intake; it should not exceed 1 teaspoonful a day considering that it is contained in other products (bread, canned products, cheese...).

Pregnancy is not a time for weight control. A developing fetus is very sensitive to inadequate ingestion of nutrients.

Do not try to lose excess weight immediately after childbirth. In the course of pregnancy women build up fat to be used during lactation. Breastfeeding is the best way to correct weight put on during pregnancy.

During pregnancy a woman should gain 10- 12 kg. Below is the classification of average weight gain during the second and third trimesters for women with:

- Normal weight-height indicator (kg/m^2) before pregnancy - 0.4 kg/week
- Low weight-height indicator (kg/m^2) before pregnancy - 0.5 kg/week
- Excessive weight-height indicator (kg/m^2) before pregnancy - 0.3 kg/week

Drink tea and coffee between food intakes (not earlier than two hours after meal).

Tea and coffee considerably inhibit iron absorption from foods on account of the formation of insoluble tannin complexes. Therefore, tea or coffee should only be drunk in the intervals between meals, not earlier than 2 hours after meal. During meals, it is best to drink the following drinks instead of tea: preserved fruit juice with low sugar content (stewed fruit), stewed dried fruit (without sugar), extracts from dried fruits (apricots and peaches), extract from hips, homemade fruit and vegetable juices (tomato, apple, and grape juices), and boiled water.

Infants

1. All children should be exclusively breastfed until they are six months old. Exclusive breastfeeding is nutrition consisting solely of breastmilk without adding other liquids (boiled water, tea, juices etc). Before 6 months, breastmilk completely satisfies the needs of the infant for all nutrients and the child does not require any additional foods, including boiled water.
2. It is recommended to breastfeed infants for up to two years, since breastmilk provides nutrients as well as protection from diseases due to anti-bodies that the baby receives from breastmilk.
3. Starting at six months old, the child *needs* complimentary nutrition as well as breastmilk. Both early and late introduction of complimentary nutrition increases the risk of infectious and respiratory illnesses as well as decelerates physical and psychomotor development of the child.

Ill-timed introduction of complimentary nutrition has dangerous shortcomings:

When introduced too early:

- Complementary foods may replace breastmilk and this will decrease production of milk in the mother.
- The risk for intestinal disorders and allergies may increase due to immaturity of the intestinal tract.
- Infants become open to pathogens that might be present in food or water and this increases risk of illness.
- Traditional foods for complementary nutrition include thin soups and watery porridges that are lower in energy and nutrients than breastmilk.

When introduced too late (well after six months)

- Delay or absence of physical development as a result of inadequate supply of energy and nutrients from breastmilk.
- Increased risk of intestinal and respiratory illnesses as a result of the imbalanced nutrition status caused by inadequate supply of nutrients.
- Worsened iron deficiency anemia and iodine deficiency conditions resulting from an inadequate supply of vitamins and minerals in breastmilk needed for a growing organism.

4. Every complementary feeding should be high in calories and nutrients. The first goal is achieved through adequate volume and thickness of the food and the second goal is accomplished through the variety of products used.

Remember that an infant's stomach has a small capacity that is about 30 ml per kilo of weight. Demands for nutrients in a young child are great owing to rapid growth. Hence, the small amount of food that the baby can eat at this age should be high in calories and nutrients. Complementary nutrition should be sufficiently thick so that the baby can be spoon-fed (so that a spoon would sink slowly in it). In order to achieve the desired thickness some water may be replaced by breastmilk. It is useful to enrich thick porridge with vegetable oils or butter/*kaymak* (to increase calorie content), with fruits and vegetables (to improve vitamin and mineral content), and with eggs, meat, fish, legumes (French beans, peas, mung beans), or nuts (sources of protein). At the same time meat and fish are necessary foods during the first year of life, because they help prevent anemia by being a valuable source of iron. Meat is introduced into the baby's diet at six months, first it should be boiled and mashed, then it should be boiled and minced, and later beginning at nine months it can be thinly sliced.

When cooking for children there is no need to add salt, sugar, or spices.

5. Children younger than nine months should not be given non-modified cow's milk; however, it may be used in preparing complementary foods from six to nine months. From nine to twelve months cow's milk may be introduced into a child's diet as a drink.

One of the main causes of iron deficiency anemia in young children is extensive use of cow's milk in their diet. This is because of the low iron content in, and mal-absorption of iron from, cow's milk. Moreover, most surveys prove that early introduction of non-modified (undiluted) cow's milk and other dairy products could cause intestinal bleeding and thus affect the iron status.

Because of the high content of protein and sodium in cow's milk (3-4 times as high as in breastmilk), it increases the osmotic load on the young child's immature excretory and kidney system. Therefore, it is not recommended to give undiluted cow's milk to children younger than nine months and it is only recommended for use in cooking porridges (diluted). When introducing sour milk products into a child's diet from six to nine months, they should be diluted according to a 1:1 ratio. After nine months whole milk and dairy products may be introduced undiluted and without being degreased.

6. During their first two years of life children should not be given tea (black or green). Tea contains polyphenols (tannins) that form insoluble complexes with iron and considerably decrease iron absorption in the small intestine.

Annex 5: Methodical Recommendations on Introducing Iron Medications in Anemia Prevalent Regions

This report gives methodical recommendations on introducing iron medications among people living in regions with a high prevalence of iron deficiency anemia (aimed at preventing anemia and treating mild and moderate forms).

Sources: R. Stoltzfus, M. Dreyfuss (International Nutritional Anemia Consultative Group WHO/ UNICEF), 1998

Methodical Recommendations on Introducing Iron Medications for Pregnant Women

Prevalence of Anemia among Pregnant Women	Dosage	Duration
>40%	60 mg of iron and 400 mcg of folic acid <i>daily</i>	6 months during pregnancy *
≥ 40%	60 mg of iron and 400 mcg of folic acid <i>daily</i>	6 months during pregnancy and 3 months postpartum

Note: * If it is impossible for a patient to take iron medication for 6 months during pregnancy, then it is necessary for him/her to continue taking the medication for 6 months postpartum or increase the dose to 120 mg during pregnancy.

If iron medications containing 400 mcg of folic acid are unavailable, then medications with lower content of folic acid may be used instead. Iron preparations with lower content of folic acid are to be introduced only in the absence of preparations containing 400 mcg of folic acid.

Methodic Recommendations on Introducing Iron Medication for Children aged 6-24 Months

Prevalence of anemia among children aged 6-24 months	Dosage	Birth Weight	Duration
>40%	12.5 mg of iron and 50 mcg of folic acid <i>daily</i>	Normal	From 6 to 12 months old
		Low	From 2 to 24 months old
≥ 40%	12.5 mg of iron and 50 mcg of folic acid daily <i>daily</i>	Normal	From 6 to 24 months old
		Low	From 2 to 24 months old

Note: If prevalence of anemia among children aged 6-24months is unknown, it should be assumed that it is the same as that among pregnant women in the same strata of society.

Iron doses should base on 2 mg iron per kilo of body weight a day.

Methodical Recommendations Regarding Introduction of Iron Medications among other Population Groups

Age Groups	Dosage
Children aged 2-5 years	20-30 mg of iron <i>daily for 3 months</i>
Children aged 6-11 years	30-60 mg of iron <i>daily for 3 months</i>
Adolescents and Adults	60 mg of iron <i>daily for 3 months</i>

Note: Doses of iron for children aged 2-5 years should be based on 2 mg of iron per kilo of body weight.

To prevent development of defects in the nervous system of the fetus, adolescent girls or women of reproductive age should add 400 mcg of folic acid to iron preparations.

Preventive Doses in Introducing Iron Medications

(in the form of Fe SO₄) once weekly for 7 months:

Source: report of the UNICEF / WHO "Prevention and Control of Iron Deficiency Anaemia in Women and Children", 1999 and

"Guidelines for the control of iron deficiency in countries of the Eastern Mediterranean, Middle East and North Africa", 1995

- Children aged 6-12 months - 30 mg of iron in form of syrup or 3 mg/kg of body weight beginning when the baby is 6 months old
 - Children aged 12 -18 months - 60 mg of iron 400 mcg of folic acid
 - Women at reproductive age - 60 mg of iron and 400 mcg of folic acid
 - Pregnant women - 120 –180 mg of iron and 400 mcg of folic acid
- Lactating women - 60 mg and 400 mcg of folic acid

Methodical Recommendations Regarding Introduction of Iron Medications among the Population Living in A Region with High Prevalence of Iron Deficiency Anemia

Age Group	Dosage	Duration
< 2 years	25 mg of iron and 100-400 mcg of folic acid <i>daily</i>	3 months
2-12 years	60 mg of iron and 400 mcg of folic acid <i>daily</i>	3 months
Adolescents and women of reproductive age	120 mg of iron and 400 mcg of folic acid <i>daily</i>	3 months
Pregnant women	120 mg of iron and 400 mcg of folic acid <i>daily</i>	3 months

Note: Upon completion of the three-month treatment course, pregnant women and children in the first year of life should continue taking iron medications according to prevention specifications.

Indications for obligatory hospitalization in the case of severe anemia detection: pregnant women (36 + weeks, or last month of pregnancy), signs of respiratory or cardiac disorders.

If the patient is treated according to the above-mentioned schedule of outpatient treatment s/he should be examined in a week and then again in four weeks. Indications for hospitalization: if the condition does not improve in one week, or if treatment does not have a positive effect after four weeks.