

Consumer and Resource Management Issues Impacting Food Choices For Orphans in Nukus, Uzbekistan

The focus of the project was to identify 1) poor consumer choices that directly impact the nutritional status and health of orphans in Uzbekistan, and 2) pragmatic solutions which involve little or no increase in cost and which could be implemented immediately. Background on the environmental, economic, and health problems facing Uzbekistan is presented. Improvement of orphan facility meal plans at no additional cost are suggested, and plans for education of caregivers are outlined.

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Introduction

Uzbekistan, formerly the third largest of the Soviet republics by population, is now considered the most populated and most powerful state in Central Asia. In 1994, the population was approximately 23 million people, and about half of them were under the age of nineteen years. Located just north of Afghanistan, and nestled between Turkmenistan and Tajikistan, Uzbekistan currently is facing serious economic, environmental, and health problems (Curtis, 1997). Extreme poverty in rural areas, environmental devastation, contaminated drinking water, poor nutrition, and lack of education about basic nutrition and sanitation procedures have contributed to the prevalence of debilitating illnesses. Health problems initiated during childhood prevail throughout the lives of Uzbek citizens, especially those living in poor rural regions of the country (Curtis). At great risk are the orphans living in such villages.

The focus of this paper is twofold: 1) the identification of poor consumer choices that directly impact nutritional status and health of orphans in Nukus, Karakalpakstan in Uzbekistan, and 2) solutions which involve little or no increase in monetary cost and which could be implemented immediately. The research findings presented here reflect data collected by one of the researchers during a stay in rural Nukus. Solutions take into account the limited resources and educational background of the caregivers, as well as regional resources available.

Focus of the Study

In 1994, Uzbekistan was considered one of the poorest of the developed countries in the world. The average wage for individuals was less than \$50/month (Curtis, 1997). Between 1990 and 1993, the cost of living in Uzbekistan increased more than nine-fold (The Europa World Year Book, 1995), despite the lack of substantial change in wages. Limited resources of the people impact the nutrition and health of the most vulnerable of Uzbekistan's citizens, the orphans, including children of incarcerated parents. In the region in which the researcher made observations, orphans lived with extended family, but attended an orphan facility after school from midday through late afternoon. The facility was located within a five-block area of low-income housing, and provided the midday meal for the children. During the summer and school holidays, the children came to the facility two days a week for lunch and activities.

Improvement of the nutritional content of these lunch menus at no additional monetary cost is the focus of this research. Conversion of food prices from the Uzbek cym to U. S. dollars, and comparison of food prices in Uzbekistan with the price of the same foods in the United States are included in Table 1. This will give the reader some sense of the regional cost of food as well as the percentage of the monthly income each food purchase represents (based on an average monthly wage of \$50).

Table 1

Comparison of Uzbekistan and U. S. Food Prices, and Food Purchases as a Percent of Uzbek Ave. Weekly Income

Food Product	Uzbek cym ^a /kg.	Uzbek cost \$/lb. or unit	U. S. cost \$/lb. or unit	Servings/lb. or unit ^b	% of Uzbek ave. inc./wk. ^c
Apples	55	\$0.19	\$0.70	3-4	1.7%
Beans	155	\$0.54	\$0.76	10	4.7%
Beef	400	\$1.40	\$1.49	8	12.1%
Bell Peppers	13	\$0.05	\$1.09	8-12	0.4%
Bread	43	\$0.15	\$0.67	16	1.3%
Butter	750	\$2.62	\$2.39	48	22.7%
Cabbage	30	\$0.10	\$0.39	3	0.9%
Carrots	15	\$0.05	\$0.49	6-7	0.5%
Cucumbers	25	\$0.09	\$0.69	10-12	0.8%
Eggs (10)	170	\$0.59	\$0.80	10	5.2%
Garlic	60	\$0.021	\$10.18	--	1.8%
Grapes	100	\$0.35	\$1.49	5	3.0%
Macaroni	140	\$0.49	\$0.75	6	4.2%
Melons	23	\$0.08	\$0.42	2	0.07%
Milk	50	\$0.17	\$1.00	2	1.5%
Oil	280	\$0.98	\$0.82	48	8.5%
Onions	23	\$0.08	\$1.69	8-12	0.7%
Peaches	80	\$0.28	\$1.49	4	2.4%
Peanuts	400	\$1.40	\$1.69	7	12.1%
Pears	60	\$0.21	\$1.19	3-4	1.8%
Plums	40	\$0.14	\$1.49	4	1.2%
Potatoes	55	\$0.19	\$0.36	4	1.7%
Raisins	450	\$1.57	\$2.26	12	13.6%
Rice	220	\$0.77	\$0.46	4	6.7%
Sausage	890	\$3.11	\$3.19	8	27.0%
Sugar	250	\$0.87	\$0.30	48	7.6%
Tomatoes	15	\$0.05	\$1.19	8	0.5%
Watermelons	23	\$0.08	\$0.69	2	0.7%

^a 130 Uzbek cym = 1 U. S. dollar.

^b Based on USDA recommendations, (USDA, 1993).

^c Based on Uzbek average monthly income of \$50 (Curtis, 1997).

Background on the Environmental and Economic Devastation of the Region

Uzbekistan, though rich and varied in its environment, is suffering from severe environmental crises. The draining of the water systems that feed the area, as well as the heavy use of chemicals in agriculture have had devastating effects on the ecosystem, resulting in enormous economic challenges for those who live there. Nukus is located in the Autonomous Republic of Karakalpakstan, an independent Uzbekistan republic, in the Aral Sea region. The demise of the Aral Sea, a world famous environmental disaster, is probably the most visible indicator of man's capacity to cause both ecological and economic destruction to an entire region (Curtis, 1997).

Beginning in the 1960s, water was diverted from the Aral Sea by canals constructed to carry its water to cotton fields in the area. The cotton industry thrives, with cotton one of the most important exports of the country. However, the Aral Sea is now considered a "dead sea" since surrounding countries also diverted incoming water feeding the sea from the Amu Darya and Syrdariya rivers. Thus, the Aral Sea lost its inflowing waters at the same time it was being drained by increased outflow to the cotton. At one time the Aral Sea was the fourth largest inland body of water in the world; now, it is the tenth largest (Ataniyazova, 1999).

The cotton mono-culture has led to the pollution of the area through the excessive application of pesticides such as Lindane and DDT. These pesticides are long lasting, cumulative, and have led to pollution of the ground

water, rivers, and soil in the region. There has been a 20-30% decline in agricultural production due to the increase in soil salinity, climatic changes, lack of water, and the poor health of the labor sector which further reduces productivity (Japan International Cooperation Agency, 1996).

Water quality is very poor in the region due to mineralization and pollution from agricultural chemicals and the mining industry. There are 3-5 times the maximum allowable concentrations of agricultural manure, pesticides, phenols, and oil by-products in the water system. Most drinking water does not meet acceptable standards; lead, strontium, nickel, cadmium, manganese, magnesium and zinc in the drinking water also exceed the maximum allowable concentrations. These levels of mineralization and pollution have affected the quantity and quality of fish in the rivers, and destroyed much of the plant life that naturally grew in the region (Kulakov, Kirbasova, & Ponomareva 1993; Reymov & Konstantinova, 1991).

The impact of the decline of the Aral Sea has been widespread. As a consequence of man's interference in the natural balance of the region's ecosystem, 40,000 to 60,000 fishermen have lost their livelihoods, and other fish-related activities such as the fish cannery have declined significantly (Glants, Rubinshtein, & Zonn, 1993). The economic effect on Karakalpakstan, where the Nukus orphan facility is located, is clear-- it is now one of the poorest regions in the entire country of Uzbekistan.

Impact on Health

The environmental crisis in Uzbekistan has impacted not only the economic infrastructure, but also the health condition of the people. The collective impact of environmental problems has far-reaching implications. Child-bearing women and their children in particular suffer from health problems as a result of chemical pollution, lack of health care resources, low family incomes, and poor agricultural productivity. For fifteen years there have been increasing rates of morbidity and mortality in the maternal and child population. Birth defects are five times higher than in Europe (Ataniyazova, 1999).

Some of the health problems can be linked directly to poor nutrition and lack of food sanitation. Such diseases include typhoid and hepatitis from contaminated drinking water, increasing incidence of diarrhea and dysentery, anemia, and "lag in physical development" of children (Curtis, 1997). Clearly, boiling or other techniques for purification of the water used for drinking and food preparation is indicated.

In interviews with physicians, one of the researchers learned that in Nukus there is an increasing incidence of kidney stones reported by young women, including teens. Doctors attribute this condition to the combination of poor diet and substandard water quality. In addition, iodine deficiency results in a high incidence of goiter, and lack of fluoride in rampant dental carries. A very high rate of iron-deficiency anemia has been identified, almost 100% in those areas closest to the Aral Sea (Ataniyazova, 1999). Iron deficiency results in poorer cognitive performance and delayed psychomotor development in children (Walter, DeAndraca, Chadud, & Perales, 1989; Pollitt, Saco-Pollitt, Leibel, & Viteri, 1986). In the case of the orphans of Nukus, anemia is directly linked to the inability of the caregivers (either those at the orphan facility or extended family) to purchase iron-rich foods such as meat, eggs or even legumes. In summer, poor families exist primarily on melons and bread. Aggravating the situation is the custom of drinking black tea at each meal, a practice which inhibits the absorption of any traces of iron that might be present in the diet (Queen & Lang, 1993).

A Pragmatic Approach

For the improvement in overall health in general and the prevention of nutritional deficiencies, nutrition education directly related to food choices in the marketplace is crucial. Specifically, learning how to substitute inexpensive, nutritious foods for the typically offered nutritionally-void fare in the orphan facility presents a solution for a host of nutrition-related health problems. An important consideration, of course, includes the economic and human resources of the orphan facility. For example, if implementation of a more nutritious diet required additional cooking facilities and hiring a cook, this would not be a reasonable solution. The pragmatic approach, then, must include consideration of cultural and economic issues as well as obvious nutritional solutions.

A typical lunch menu at the orphan facility might include 3-5 items, such as bread, a muffin, crackers, hard candy, and black tea-- quite literally, bread and water. Table 2 contains another such menu, and indicates the nutritional weaknesses. A plan for the improvement of such a meal plan with little increase in the cost of food and other limited resources is presented as follows. First, specific cost-effective food substitutions are suggested, followed by suggestions for implementation of the improved menu. One of the researchers intends to return to

Uzbekistan to work with the care providers of Nukus orphans to explore these and other options, and to provide education about the links between nutritional deficiencies and specific health conditions such as anemia. This will be an extension of the work begun in Nukus in the summer of 1999 when the researcher presented a series of seminars using the USDA Food Guide Pyramid. The guide has been translated into the Russian language, reflecting a tangible outcome of the researcher's Uzbekistan project.

Table 2
Original and Improved Menus and Costs for the Orphan Facility

Original Menu Items	Cost/Child	Missing Nutrients	New Menu Items	Cost/Child	Nutrients Added
2-3 Slices Bread	17.5		2-3 Slices Bread	17.5	
Salad: Cucumber, Tomato, Onion	30.0		1 Egg	17.0	
Crackers	18.0		Salad: Cucumber, Tomato, Carrot, (Onion = ½ orig. amt.)	22.0	
			2 Tbs. Yogurt	2.0	
			½ Cup Milk	8.3	
Total Cost	65.5		Total Cost	66.8	
		Protein, Iron, Calcium, Vit. A			Protein, Iron, Calcium, Vit. A

Cost and Nutrition Comparison of Food Substitutions

In Table 2, a cost comparison for the substitution of more nutritious foods at a comparable price is given. One menu has been suggested for considerable improvement of nutrition content, with little change in the food budget of the facility. Implications of important nutritional changes are discussed as they pertain to diet and health in general, as well as to specific menus.

Typically, facility menus include no source of complete protein in the meal. Grain products usually are deficient in the essential amino acid lysine; however, when grains are consumed with lysine-rich legumes such as peanuts or beans, a complete protein source is provided. Unfortunately, grain products in Uzbekistan are not enriched with iron, as are those in the United States. Thus, most menus at the orphan facility are completely devoid of iron. The addition of egg, beans, or peanuts would help correct this deficiency. Raisins would also give the children an excellent source of iron. But the best source of iron would be red meats like beef or mutton, products too expensive for the budget of this facility. The presence of Vitamin C in fruits or vegetables would enhance the iron utilization, whatever its source. A further recommendation would be the elimination of the black tea typically served with each meal, as this beverage is a known inhibitor of the absorption of iron from food. Additionally, an iron supplementation program which UNICEF is beginning to implement (Ataniyazova, 1999) likely will make a huge difference in the incidence of iron-deficiency anemia in the people of Karakalpakstan.

In addition to being deficient in iron, the menus are lacking in other vitamins and minerals as well. Unless a milk product is served, there is no calcium source. If salad is not included, there is no source of vitamin C. Fruit in season would provide an excellent additional source of Vitamin C at a low cost. Yogurt as salad dressing would supplement the diet with some calcium. Typically, Vitamin A is missing from the menu. This could be rectified partially by the addition of even a small amount of orange carrot. (The "white" carrot, also common in Uzbekistan, is a very pale yellow; it would not provide much in the way of carotene to be converted to the active form of Vitamin A.)

For the menu shown, substantial improvements have been made to the diet at little additional cost. For this midday meal, suggestions represent the addition of nutrients equivalent to 1/3 of the U. S. Recommended Daily Allowance (RDA). Although it was possible to make positive changes in the nutrient content of the meals, the fact remains that the meals still do not supply the recommended *quantity* of food required for normal growth and development (Queen & Lang, 1993). Therefore, the new meal plans are much improved given the resources available, but still are not optimal. Additionally, not every possible missing nutrient could be provided by the recommended substitutions.

For the menu (bread, salad, and crackers) originally low in protein, iron, calcium, and Vitamin A, the following substitutions and additions were made. In place of one half of the onion in the salad, carrots were substituted. Two tablespoons of yogurt were added as salad dressing. The crackers were omitted, and replaced with an egg and one half cup of milk. This improved or corrected all of the nutritional weaknesses listed.

Implementing the Plan

The following suggestions are offered for cost-effective implementation of the new food plans. These guidelines take into consideration the realities of the region, and suggest the use of resources that do not introduce new financial costs. Underlying assumptions are that families care about the health and welfare of extended family members, and are willing to make changes for the improvement of overall health in the orphans of Nukus. The researcher has observed that families are concerned about the health of family members, but the need for education about nutrition and sanitation is great. Solutions offered are intended as an *initiation* of the process of maintaining good health over the life span, and not as a simplistic solution for all of the health problems facing the families of Uzbekistan.

1. Low cost food choices: Specific substitutions are listed for the menu shown. Each of the facility's menus will be revised in a similar way to provide variety and to incorporate seasonal foods that are both plentiful and cost effective. Both warm- and cold-weather menus will be provided when the researcher returns. Note in the meal plan (Table 2), food substitutions were possible at an almost identical cost, (actually only 1.3 cym more, which is the equivalent of one U. S. cent). The variation in what is being spent per child per day is \$0.32 to \$0.51. Nutrition education is essential in the ongoing facilitation of improving the health of Nukus orphans. Suggested plans for education are offered in #4 below.

2. Food preparation: Uzbekistan is rich in the type of energy resources needed for food preparation. Natural gas is abundant and inexpensive (Curtis, 1997), and many homes in the region enjoy the use of natural gas to fuel hot water heaters. Therefore, the cooking of food would not considerably add to the cost of providing good nutrition for the orphans of Nukus. The resources lacking are labor and equipment. The orphan facility does have limited kitchen facilities that include a two-burner gas cooking unit and a sink with running water. Some cooking could take place on site with very little effort, such as the boiling of eggs or beans. For food preparation requiring more extensive cooking, other options must be explored.

One solution would be for the extended families involved in the care of the children to volunteer their services to cook an occasional meal on a rotating basis. For a facility housing the children of 20-24 different families, a commitment of one meal cooked per month would not seem unreasonable. In exchange for food preparation services, the family member could be allowed to partake of the meal. The preparation of food within the family home would eliminate the need to provide additional cooking facilities on site.

3. Food preservation: Uzbekistan has the advantages of a warm climate, long growing season, and plentiful irrigation sources (Curtis, 1997). Therefore, the preservation of food is not as critical an issue as it is in more northerly regions of the world. It is important, however, to preserve nutritious foods that are in abundance during the growing season so they are not wasted and can provide important nutrients needed throughout the year. Solar dehydration of fruits and vegetables is a low-cost option suited to the climate, and involves no additional use of energy resources. Storage of dried foods would not present the same space and equipment problems inherent in the storage of home-canned or home-frozen foods. Again, cooperation of extended families would facilitate the accomplishment of this important task.

4. Nutrition education: Funding is being sought for printing of the USDA's Food Guide Pyramid translated into Russian, the predominant language of the region. Information about serving sizes and caloric needs by gender and stage in the life cycle is included with the guide. Distribution of and basic education about the use of the Food Guide Pyramid for orphans and their care givers, including extended family, is expected to take place in summer 2000. The current director of the orphan facility in Nukus was very receptive to suggestions by the researcher on site, and is looking forward to further assistance with improving the nutrition content of the food served to the orphans in her care. Additional education about the sanitation of food and water, food preservation, and nutrition basics will also be implemented.

Important educational opportunities need to be provided for extended families to learn consumer skills that will enhance their lives. It is particularly important to include the children in these educational events and to encourage the school to initiate projects to enhance the food program. For example, a gardening project could reduce the need to purchase fresh foods, thus allowing the purchase of more meat and milk. It might be possible to

initiate a low-cost project for the raising of hens by the children to provide eggs for the school. Since the school is organized by a private voluntary organization (PVO) which has provided tangible and labor resources in the past, PVO funding is possible.

References

- Ataniyazova, O. (1999). The environmental and health situation in the Aral Sea region. Doctors for the Environment, 1, 5-8.
- Curtis, G. E. (Ed.). (1997). Kazakstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan: Country studies (1st ed.). Washington, DC: Federal Research Division, Library of Congress.
- The Europa World Year Book. (1995). London: Europa.
- Glants, M. H., Rubinshtein, A. Z., & Zonn, I. (1993). Tragedy in the Aral Sea basin. Global Environmental Change, 3, 174.
- Japan International Cooperation Agency and the Ministry of Public Utilities, Republic of Uzbekistan. (1996, Dec.). The Study on Water Supply system in Six cities of the Aral Sea Region in Uzbekistan: Final Report, Tokyo: Tokyo Engineering Consultants.
- Kulakov, V. I., Kirbasova, N. P., & Ponomareva, L. P. (1992). Ecological problems of reproductive health. Akusherstvo I Ginekologija (Russia), 1, 12-14.
- Pollitt, E., Saco-Pollitt, C., Leibel R. L., & Viteri, F. E. (1986). Iron deficiency and behavioral development in infants and preschool children. American Journal of Clinical Nutrition, 43, 555-565.
- Queen, P. M. & Lang, C. E. (Eds.). (1993) Handbook of pediatric nutrition, Gaithersburg, MD: Aspen Publishers, Inc.
- Reymov, R. R., & Konstantinova, L. G. (1991). Ecological characteristics of Pryaralie and differentiating it as an ecological disaster zone. Otd. Akademii Nauk Uzbek, Russia, 2, 3-10.
- Shugart, G., & Molt, M. (1998). Food for Fifty (10th ed.). New York: Macmillan.
- United States Department of Agriculture (USDA). (1993). Food Guide Pyramid. Home and Garden Bulletin Number 252, Human Nutrition Information Service: Author.
- Walter, T., DeAndraca, I., Chadud, P., & Perales, C. G. (1989). Iron deficiency anemia: Adverse effects on infant psychomotor development. Pediatrics, 84, 7-17.

Endnotes

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