

Nutritional Problems in Turkey During the Weaning Period and Some Solutions

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From the points of view of geographical and agricultural structure and the socio-cultural status, Turkey can be divided into several regions. The nutritional status of people varies according to these regions in Turkey. For this reason, food production, food preservation and processing methods, cooking and feeding habits are different, to some extent, from one region to another. There are even more differences between rural and urban areas within the same region. It is therefore necessary to investigate the nutritional status of Turkey by different regions and by rural and urban areas (Figure 1).

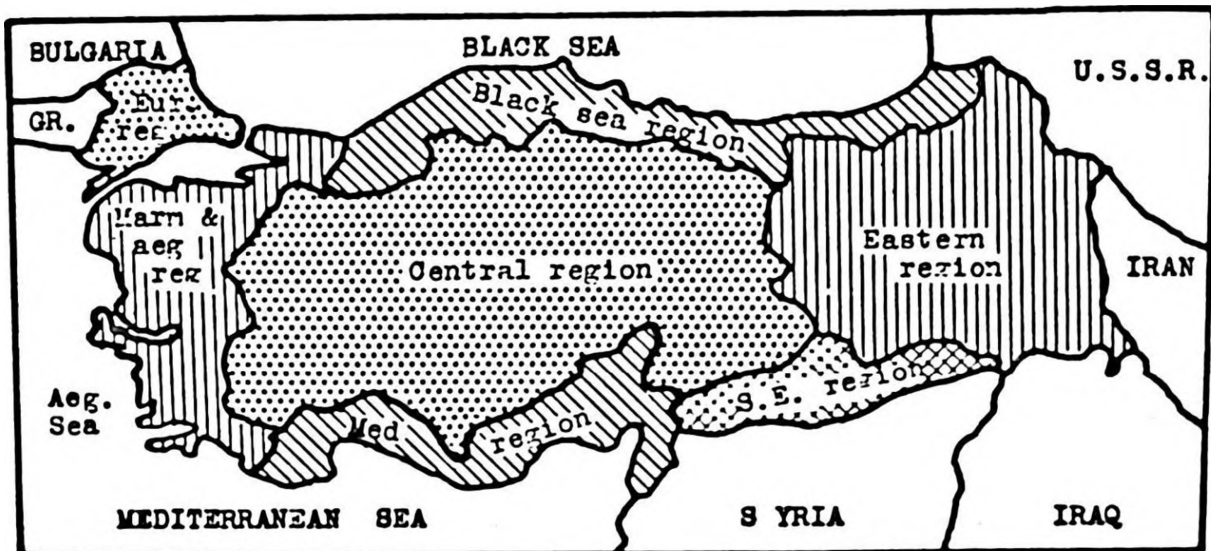


Figure 1
Geographic Regions of Turkey

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Findings Related to the Nutritional Status of Infants in Turkey

1. The Study of Vital Statistics

According to the vital statistics records compiled by the Turkish Demographic Survey,¹ the infant and toddler mortality rates in Turkey are very high. Average infant and toddler mortality rates for Turkey are 154 per thousand and 40 per thousand live births, respectively. These rates vary from region to region and are shown in Table I.

TABLE I
INFANT AND TODDLER MORTALITY RATES IN TURKEY

Region and Area	Mortality Rate per 1000 Live Births	
	Infants	Toddlers (1-4 years)
Turkey in general	154	40
Central Anatolia Region		
Urban	140	36
Rural	204	71
Black Sea Region		
Urban	98	28
Rural	162	35
Western Anatolia and Trace		
Urban	149	33
Rural	141	44
Southern Anatolia Region		
Urban	83	37
Rural	172	57
Southeastern Region		
Diyarbakır (urban x rural)	135	98 (1-3 years)
Mardin (urban x rural)	167	63 (1-3 years)
Large Cities		
Ankara	101	18
İstanbul	109	9
İzmir	105	13

The main causes of infant and child mortality are shown in Table II.^{2,3} It can be seen that infant diarrhea and respiratory system diseases are prevalent. In general, children with malnutrition are not taken to doctors and, therefore, in many cases, infections supervene as secondary diseases and cause death.

TABLE II
MAIN CAUSES OF INFANT AND CHILD MORTALITY IN TURKEY

Causes of Death	0 to 1 year	1 to 4 year
Dystrophy and growth retardation	26.7	2.1
Gastroenteritis-diarrhea	21.0	25.8
Pneumonia	26.1	34.5

CAUSES OF INFANT AND CHILD MORTALITY IN VILLAGES OF CENTRAL ANATOLIA

Causes of Death	Percent of Deaths	
	0 to 1 year	1 to 2 year
Acute loss of fluid and electrolytes	44.8	13.3
Pneumonia, bronchopneumonia	29.0	40.0
Pneumoccal meningitis	4.3	—
Tuberculous meningitis	3.2	20.0
Severe malnutrition	3.2	3.7

Comparison of figures with those of well-nourished countries will give an idea of the nutritional status of children in Turkey.

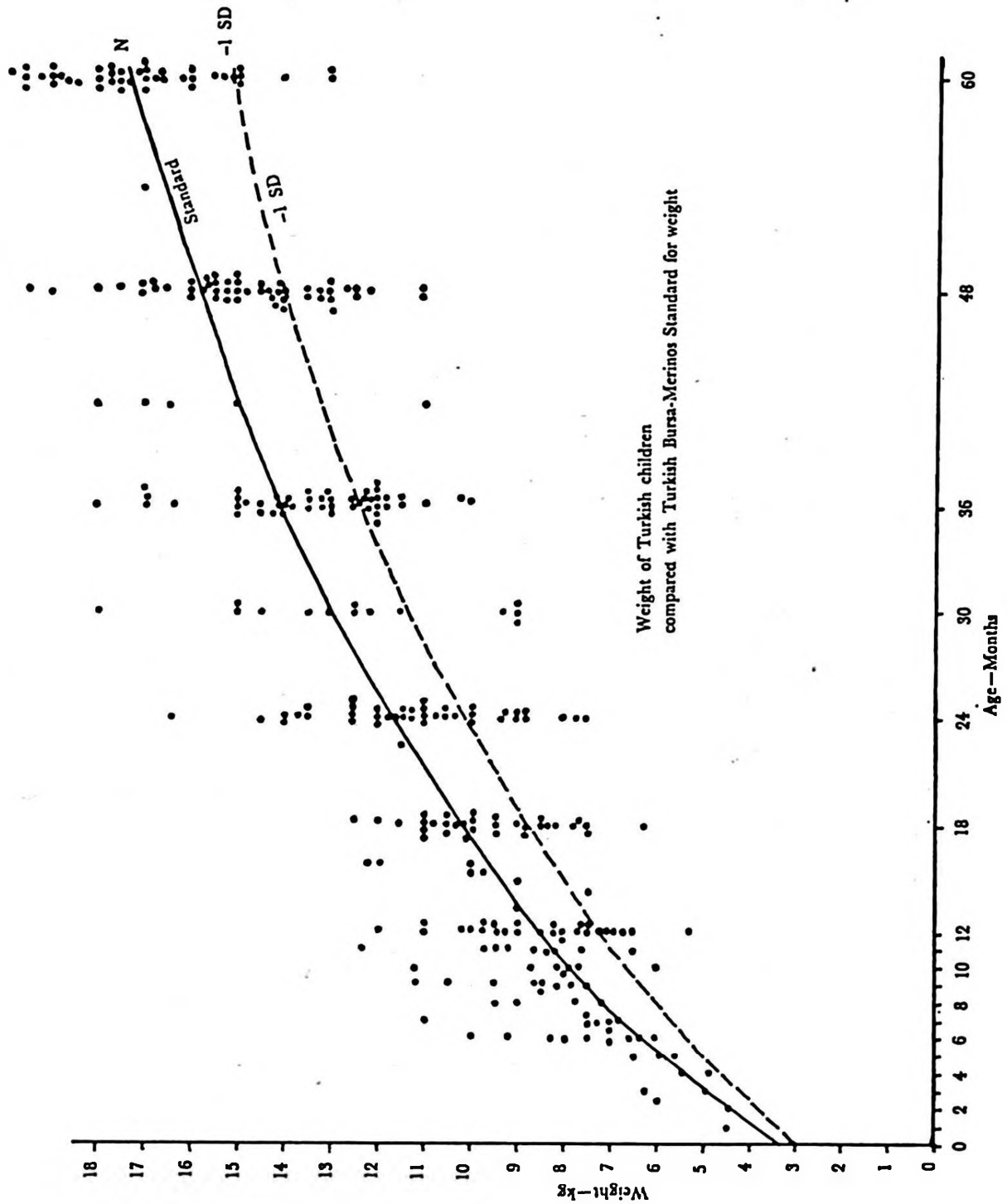
2. The Study of Anthropometric Data

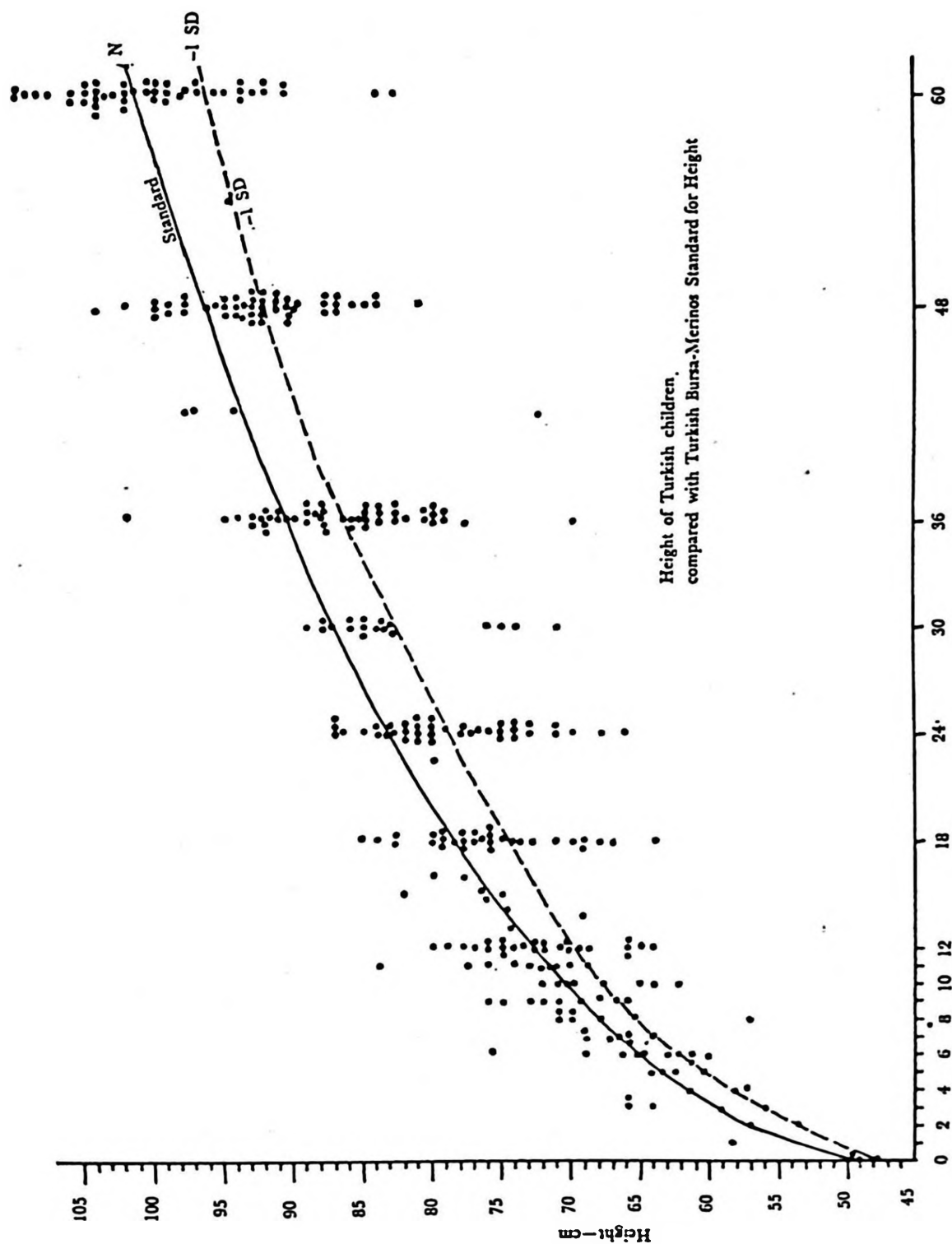
The percentage of physically retarded children is high in Turkey and is determined by the different regions and socio-economic classes. Using a height and weight standart obtained in Bursa, Turkey,⁴ the percentage of growth retardation in a rural area near Ankara is shown in Table III and Figures 2 and 3.

TABLE III
ANTHROPOMETRIC MEASUREMENT RESULTS IN RURAL AREAS NEAR ANKARA⁵ (PROPORTION OF INFANTS AND CHILDREN SHOWING RETARDATION)

Age Group	No. of Children	Weight	Height
		% of Children	% of Children
0-6 Months	130	13	17
7-12 Months	144	18	24
13-18 Months	139	36	30
19-24 Months	141	44	32
25-36 Months	128	35	36

(Figures below minus 1 standart deviation of Turkish standard was accepted as growth retardation)





Age - Months
Figure 3

However, the growth rate of children from high socio-economic groups of Istanbul city is comparable with the American standard.⁶

3. Clinical Examinations and Biochemical Test Findings

Protein-calorie deficiency disease of mainly marasmic type is a major nutritional problem and kwashiorkor is rarely seen among children in Turkey.

The incidence of marasmic type malnutrition is found to be 16 percent for 6 to 30 months of age in Etimesgut (Ankara) rural area.⁵

Twenty-five percent of the children of 0 to 3 years of age in the low socio-economic area of Ankara had signs of anemia. Nineteen percent of this was due to inadequate iron intake.² In a study in a rural area near Ankara, the percentage of anemia among children of 0-12 months and 13-24 months were found to be 22.4 and 41.3, respectively.

Rickets is also a common nutritional disease in Turkey. X-ray and clinical examinations showed the prevalence and incidence rate of rickets between 0-2 years of age to be 16.0 and 8.6 percent respectively, in the rural area of Ankara.⁸ In many parts of Turkey, the prevalence rate of rickets is between 8 and 20 percent.⁹

Although riboflavin and vitamin A deficiency signs are quite prevalent among grown-up children and adults, they are not common among infants and small children in Turkey.^{5,9}

4. Feeding Habits During Weaning Period in Turkey

a) Length of breast feeding:

Most of the mothers in Turkey breast feed their babies. However, the breast feeding period is too long in most cases. As shown in Table IV a long period of breast feeding (24 months and over) is common in many regions and especially in rural areas in Turkey.¹⁰

If the baby sucks sufficient milk, it can be said that the prolonged breast feeding prevents protein deficiency. But it has been estimated, by using test weighing, that the average mother milk yield is 800, 650, 550 and 450 cc. at 3, 6, 9, and 12 months of the birth of babies, respectively, in Turkey.¹¹ Comparison of nutrient and energy requirements with the supply of breast milk shows that babies fed with breast milk only do not get enough energy and nutrients after the age of six months.

TABLE IV
LENGTH OF BREAST FEEDING IN TURKEY

Regions	Percent of Infants Breast Fed				
	None	6 months	12 months	18 months	24 months
Aegean	0	10	15	39	36
Marmara	17	13	27	34	11
Central Anatolia	0	16	21	22	41
Black Sea	10	33	19	30	8
East	4	11	20	26	39
Southeast	9	7	12	16	56
Ankara					
Urban	11	48	22	13	6
Rural	4	14	29	18	31

b) Time for starting to give supplementary food:

Mothers, in urban areas and in western regions in Turkey, start to give supplementary foods earlier than those of rural and the eastern part of the country. This difference may be due to the fact that mothers in urban and western regions have more education. Table V shows the time for starting to give supplementary foods in various regions of Turkey.¹⁰

TABLE V
TIME FOR STARTING THE SUPPLEMENTARY FOODS

Regions	Percent of Infants (Months Beginning)				
	Early	3-4	5-7	8-10	12+
Aegean	37	28	14	3	18
Marmara	18	25	25	5	26
Central Anatolia	25	30	20	5	20
Black Sea	29	34	14	3	17
Eastern Region	16	10	21	3	50
Southeast Region	8	8	17	8	63
Ankara					
Urban	11	25	26	14	22
Rural	10	4	41	23	22

c) The kind and amount of supplementary foods:

The kind and approximate average amount of supplementary foods given to babies are shown in Table VI and VII.

TABLE VI
KINDS OF SUPPLEMENTARY FOODS CONSUMED

Regions	Milk Yoğurt	Percent of Infants (Cumulative)				
		Meat Eggs	Cereal Products	Sugar Starch	Fruits Vegetables	Meal Juices
Aegean	45	2	23	60	14	3
Marmara	55	21	16	66	23	2
Central Anatolia	62	2	9	60	4	12
Black Sea Region	73	17	17	78	15	0
Eastern Region	49	2	28	28	13	6
Southeast Region	33	2	26	26	9	4
Ankara						
Urban	42	5	69	40	49	0
Rural	62	3	50	46	17	0

TABLE VII
APPROXIMATE AVERAGE AMOUNT OF SUPPLEMENTARY FOOD
CONSUMED (PER INFANT PER DAY)

Regions	Milk Yoğurt	Foods (gr.)		
		Meat Eggs	Cereal Products	Sugar Starch
Aegean	76	Little	13	30
Marmara	136	7	9	26
Central Anatolia	93	Little	9	22
Black Sea Region	167	4	10	21
Eastern Region	78	Little	12	14
Southeast Region	40	Little	17	12

It can be seen from the tables that starch, sugar and cereals are the main supplementary foods given to babies in Turkey. Nearly 50 per cent of the children in many areas do not get milk and dairy products. Meat and eggs are seldom given to babies. Although most children get supplementary foods, the amount of food given usually is not enough to meet protein, calorie and some other nutritional needs.

The good quality proprietary infant foods are expensive and are not popular among the majority of families. These foods are prescribed mainly by doctors for malnourished children and are used temporarily as medicine.

The Causes of Nutritional Problems During the Weaning Period in Turkey

1. Shortage of Good Quality Foods

Meat and dairy products, eggs and sea foods are not produced in sufficient amounts to meet the needs of the country. Therefore, these foods are sold in relatively high prices and the poor people cannot afford to buy them to feed their children.

The figures related to food production in Turkey¹² and food consumption⁹ level in some regions are shown in Tables VIII and IX. It can be seen from these tables that the suitable foods for the babies of weaning period are short in Turkey.

TABLE VIII

FOOD PRODUCTION (CAPITA/YEAR) IN TURKEY (ACCORDING TO AGRICULTURAL STATISTICS)

Year	Wheat	Cereals Kg. Rice	Corn	Meat Prod. Kg.	Milk Prod. Kg.	Eggs Kg.	Total Pulses Kg.	Sugar Kg.	Sea- food Kg.
1963	330.0	4.3	33.0	15.7	112.0	2.4	12.8	15.6	4.3
1968	255.0	5.8	33.0	16.7	100.0	2.6	13.5	17.7	4.7
1972 (estimated)	246.0	5.5	47.0	18.9	107.0	3.3	14.4	23.0	6.4

TABLE IX

FOOD CONSUMPTION (CAPITA/YEAR) IN SOME REGIONS IN TURKEY (ACCORDING TO THE FAMILY FOOD CONSUMPTION SURVEY)

Region and Year	Wheat	Cereals Kg. Rice	Corn	Meat Prod. Kg.	Milk Prod. Kg.	Eggs Kg.	Sea Food Kg.	Total Pulses Kg.	Sugar Kg.
Ankara									
1965-66	191.0	6.1	—	20.3	50.2	2.6	2.2	13.0	9.2
Southeast Anatolia									
1969	176.0	4.4	—	10.8	30.7	0.6	0.2	8.0	2.3
East Black Sea Region									
1970	121.0	10.5	3.5	20.0	72.1	1.9	4.5	15.5	6.2

2. The population growth:

Since the birth rate in Turkey is very high, the total population growth is 27 per thousand in spite of high infant and child mortality rates.

The total fertility rates range from 4.9 to 7.4 per mother in rural areas and 3.1 to 6.1 per mother in urban areas.¹ The value of a child for the parents depends on whether it is a boy or a girl, first or last child and wanted or unwanted when born. This, in families with little income, and too many children becomes a burden. Parents accept disease and death as natural as they accept health and birth.

3. Ignorance:

The percentage of illiterate people, particularly illiterate women, is quite high especially in rural areas. Moreover, ignorance on the nutritional value of foods and the physiologic needs of children is widespread among many families in Turkey. This is responsible for many cases of nutritional diseases. For example, sunshine is free and plenty in Turkey, but some mothers do not expose their children to sunshine. Hence, children suffer from vitamin D deficiency and develop rickets.

4. Infectious diseases and parasites:

There is a mutual relationship between malnutrition and infectious diseases. These diseases spread more rapidly and cause more deaths among malnourished children. On the other hand, infections and parasites cause malnutrition. In Turkey, some gastrointestinal and respiratory system infections and parasites are quite prevalent among small children. Summer diarrhea, caused by various kinds of micro-organisms and ascariasis is common in rural areas and in slums.

Some Practical Solutions:

A considerable number of studies related to supplements in baby foods have been made elsewhere during the last decades. The preparation of a food mixture supplemented with protein-rich foods, minerals, and vitamins, and sold at reasonable prices, is one of the practical solutions to combat malnutrition during the weaning period.

1. Studies in protein supplements in Turkey:

According to the analyses made, sulfur-containing amino-acids and lysine are the limiting amino-acids in many Turkish diets and baby foods.

Generally, the amount of animal protein in daily diets is rather low. It will take a long time and will be a rather difficult task to increase the production of animal protein sources.

Therefore the necessity to supplement Turkish diets with protein-rich foods from plant sources emerges. Among the plant sources, pulses and oil seeds are available under existing conditions in Turkey. Therefore, on the subject of protein supplement, our efforts have been concentrated on using cotton seed flour, sunflower seed flour, soya bean flour, and chick pea flour.

The first experiments were carried out using cotton seed flour. When 5 to 15 % cotton seed flour, obtained from UNICEF, was added to wheat flour and to some other cereal meals, the result was still not quite acceptable. On the other hand, the production of gossypol-free cotton seed flour is not feasible in Turkey because there are no proper processing facilities at present.

Since the removal of the colored husk of sunflower seeds is impossible, it is difficult to use it as a protein supplement.

Five to seven percent soya grits were added to bread and some main dishes consumed in orphanages, kindergartens and in some families living in rural areas. At the end of a feeding period of approximately one year, the results of acceptability tests, clinical examinations, and anthropometric measurements were found to be quite satisfactory.

In the meantime, a less expensive mixture to feed infants and one having high protein value was developed. The composition and the nutritive value of this mixture are shown in Table X.

Using this mixture, acceptability and tolerance tests were carried out in M.C.H. clinics and in families. The results obtained were satisfactory. The children that were fed this mixture were 0 to 30 months of age. The average acceptability level was 72 percent. The mixture did not cause any intolerance symptoms and/or diarrhea. The children that were given this mixture gained, as an average, 300 grams more weight a month than those in the control group.

Consequently, it has been decided to set up a plan to process this formula in Turkey by the technical and financial assistance of the FAO, WHO and UNICEF. This plan is now under construction and we hope that production will be realized by the middle of 1971. On this occasion I would like to express my personal thanks to WHO, the FAO and UNICEF for their interest in and their aid to Turkish children.

TABLE X
THE COMPOSITION AND NUTRITIVE VALUE OF THE TURKISH
PROTEIN-RICH BABY FOOD MIXTURE
(SEKMAMA)

Formula	
Wheat Flour	37.4 %
Chick Pea Flour	18.8 %
Soya Flour	18.8 %
Dry Skin Milk	12.0 %
Sugar	12.0 %
Vitamin, Minerals, etc.	1.0 %
(Processing method: enzymatic conversion process)	
Nutritive Value	
Crude Protein (N x 6.25) %	25.4
Available Lysine g/100 g	1.22
Methionine g/100 g	0.44
Cystine g/100 g	0.44
N.P.U.	61.0
P.E.R. (Standardized)	2.27
ND-p Cals % (calculated)	11.5

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