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PLANNING FOR THE FOOD AND NUTRITION NEEDS OF CHILDREN IN LATIN AMERICA

by

Food and Agriculture Organization of the United Nations

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I BRIEF REVIEW OF THE DEMOGRAPHIC AND NUTRITIONAL SITUATION

1. The area commonly described as Latin America covers the whole territory of the Western Hemisphere south of the United States, including Mexico, Central America, the Caribbean and all of South America. It is a region of great contrasts. In spite of a wealth of natural resources, per caput income is low,

2. More than two hectares of agricultural land are available per person in the Americas, whereas the corresponding figure for Europe is 1.3 hectares and for Asia only .4 hectare and, in addition, there are in Latin America large areas of unused but potentially productive land, but the low productivity of land and of agricultural labour counteract these conditions.

3. Agricultural production per hectare in Latin America in terms of economic wheat equivalent is only 350 Kg. compared to a figure of 880 Kg./ha. for North America. The gap between the two regions in agricultural production per person is similarly wide. Expressed again in terms of wheat equivalent only 830 kg./person are produced in Latin America against 2,220 kg./person in North America. The disparities in per unit food production which contributes over 80 percent to the total agricultural production in both regions are similarly large.

4. As a result of this low productivity, food supplies for the region as a whole are only marginally adequate in quantity and quality, regardless of the ample natural resources. In fact, as Table 1 shows, the average supply of calories, which measures the quantitative aspects, exceeds by 5% the average calorie requirement set for the region, also the percentage of total calories derived from cereals, roots, starch and sugar, as well as the animal protein consumption (the two most widely accepted indicators of the nutritional quality of the diet) appear to be not too unsatisfactory.

5. The figures in Table I, indicating the general level of the Latin American diet, do not reveal the whole picture. There are wide variations among countries in the region. While the population of the River Plate countries, on an average, enjoys an adequate daily diet of about 2,800 Calories, 80 grams of total protein and 50 grams of animal protein, the population of Colombia, Ecuador, El Salvador and Guatemala, for example, have to live on a daily per caput supply of about 2.000 Calories, 50 grams of total protein and 20 grams of animal protein. The situation in this respect within the countries is often even worse because available supplies - both geographically and seasonally - are distributed very unequally. A satisfactory transportation system, particularly in the mountainous areas, is often lacking. Market organizations and marketing facilities are, in general, primitive and storage facilities are very limited. Consequently food losses are very high. For all these reasons it is not surprising to find a wide range of food consumption and nutrition problems all over Latin America. Inadequate food consumption interms of supplies of food energy,

i.e. undernutrition, may be found among population groups such as the low-income urban population and poor peasants in the mountainous areas. Mal-nutrition resulting from many factors, among them a heavy reliance on carbohydrate foods and insufficient consumption of food rich in protein, vitamins and minerals, is common in many countries of the region. Such shortages lead to a variety of deficiency diseases like "sindrome pluricarencial infantil", anaemia, endemic geitre, avitaminosis, etc. Among the countries which are particularly affected are, for example, Brazil, Colombia, Ecuador, Mexico, Peru and the Central American countries.

6. The situation is further aggravated by very fast growth of the population in Latin America, which is the highest among the major regions of the world. As Table II shows, the rate of growth of population has increased to 2.6 percent compound per annum during the last 15 years. This was mainly due to the recent rapid decline in death rates while birth-rates remained generally high. The rate of growth is still increasing and will soon be around 3 percent per annum and this means that the population will double in 23 years. Another striking feature is the fact that people do not migrate into the unsettled areas of the region but mostly into the densely populated towns and cities.

7. In spite of the unfavourable conditions mentioned above, food production in Latin America has increased by 41 percent over the period 1950-1962. However, over the same period population increased by 40 percent so that per caput food production has been the same, or even slightly lower, than during prewar years (Table III).

8. With regard to the quantitative aspect, trends in food supplies have been generally more favourable owing to the decrease of experts and increase of imports of food stuffs. The same is not true, however, for the nutritional quality of the available food. While the total calories supply is now nearly 20 percent higher than at the pre-war level, the supply of animal protein has decreased by nearly 20 percent.

9. The food problem facing the region in the future is primarily to raise the nutritional quality of the diet and, at the same time, to provide food for the expanding population. Nutritional targets aiming at the elimination of undernutrition and malnutrition, particularly by meeting the needs of children and other vulnerable groups of the community at about the turn of the century, have been formulated in FAO's Third World Food Survey, and are set out in Table IV. It can be seen that, in order to provide the minimum food essential for a healthy, active life, the overall food supplies per caput available today will have to be increased by 11 percent and the supplies of animal products by 22 percent by the year 2000.

These increases are not very high and their realization does not seem to pose too big a problem. However, the dimension of the increase needed in total food production can be judged only against the background of the population growth. Table V presents the most recent U.N. population projections which show that, to meet the increase in population alone, without any improvement in either the quantity or the quality of the diet, food supplies will have to be raised by 53 percent by 1975, and almost trebled by the turn of the century. In order to fulfil the nutritional target for the growing population by the year 2000, total food supplies need to be increased by about 230 percent and animal foods by almost 260 percent. These increases require dramatic efforts towards reorganizing agricultural production, shifting from traditional subsistence to more effective agriculture, planning better land use as well as relating nutritional policies and development efforts. Food supplies may be considerably expanded by bringing new lands into cultivation by improvement of weeds and breeds and of farming practices suitable to the new land, by development of transportation and marketing facilities and organization, and also by prevision of long-term credit. Most, if not all, of these require sizeable planned investments in the upgrading of knowledge and skills of a large number of technicians and of farmers, as well as large investments in agricultural requisites.

10. If the context of the present paper which deals with the nutrition of children, the figures set out in Table VI, which shows the population of Latin America in 1960, 1975 and 2000 by age-classes, are particularly relevant. It may be seen that, instead of 88 million children in 1960, by the year 2000 more than 230 million children will have to be supplied with adequate food. This would hardly be possible within the framework of the normal channels of food supply. It is, therefore, of the utmost importance that the required supplies are distributed according to the needs, particularly of children and also to other vulnerable groups of the population, both through schools, clinics, hospitals, etc., and by means of associated measures of nutritional education. The distribution measures to be taken require detailed planning and the present paper will indicate the procedures for improving the nutrition of children within the framework of an overall development plan.

TABLE I Trends in the Level of Diet in Latin America
(Per caput per day)

	Prewar	Postwar	Recent
Total Calories	2160	2315	2520
Calorie Requirement */	2400	2400	2400
Calorie Supplies as Percentage of Calorie Requirements	89	96	105
Calories Derived from Cereals, Starchy Roots and Sugar (Per cent)	63	66	64
Total Protein (Grams)	64	62	65
Animal Protein (Grams)	28	22	23
Price Weighted Indices of Total Food Supplies (Prewar = 100)		91	96

* Rounded to the nearest 50.

TABLE II Population and Population Growth in Latin America

Year	Populations (Thousands)	Annual Percentage Rate of Growth (Compound)
1938	125,100	2.2
1950	162,100	2.6
1963	228,000	

TABLE III Trends in Population and Food Production, Total and Per Caput, in Latin America (Prewar = 100)

	Postwar (1948/49 - 1952/53)	Recent (1961/62 - 1963/64)
Population	130	182
Food Production	126	178
Per Caput Food Production	94	98

TABLE IV Nutritional Target for Latin America

	Available (At Present) Per Caput Per Day	Required (Year 2000) Per Caput Per Day
Calories	2,520	2,600
Calories Derived from Cereals, Starchy Roots and Sugar (Percentage)	64	62
Total Protein (Grams)	65	72
Animal Protein (Grams)	23	28
Overall Index of Per Caput Food Supplies	100	111
Overall Index of Per Caput Animal Food Supplies	100	122

TABLE V Projected Growth of Population and Index Numbers of Population in Latin America (1960 = 100)

Year	Population (millions)	Index Numbers
1975	324.5	153
2000	624.0	294

TABLE VI Composition of the Population in Latin America - 1960 and Projected for 1975 and 2000

Age (Year)	1960	1975	2000
	millions		
0 - 4	35.2	52.2	86.1
5 - 14	53.2	83.7	149.8
15 - 24	39.2	61.3	121.0
25 - 44	51.5	75.3	161.0
45 - 64	25.9	39.3	78.6
65 and over	7.0	12.7	27.5

II THE SITUATION OF CHILDREN AND YOUTH WITH RESPECT TO FOOD AND NUTRITION

11. Latin America has serious food and nutritional problems, especially as regards the so-called "nutritionally vulverable groups" formed by infants, children and mothers because of their special nutritional needs. A large and important segment of the population of Latin American countries is made up of children and youn people whose nutritional requirements should be given the highest priority.

12. Since a healthy, well-fed infant more than doubles its birth weight in the first six months of life, and triples it in one year, special care should be taken during the period of weaning to ensure that all nutritional needs, particularly the intake of proteins, might be adequately satisfied during this period of rapid growth. The acceleration of growth during adolescence also demands greater nutritional care. During these periods children and youth require relatively more calories, proteins and other nutrients than adults.

A. Food Consumption and Nutritional Requirements

13. Latin American countries have little specific information on the food consumption of children, adolescents and mothers. The main sources of information are the national food balance sheets, and dietary surveys of population groups in various countries. They provide information mainly at national and family levels, but are useful for judging the adequancy of the diets of mothers and children.

14. These food balance sheets are based on information provided regularly by the specialized agricultural and economic egencies of each country on food production figures; imports and exports; number of inhabitants; amount of food used for industrial purpose, for animal nutrition, and other complementary information. These sheets give data on the per capita food supply and, in the case of basic foodstuffs, it is possible to calculate the total caloric value of a diet and its protein content and that of other nutrients.

15. In order to ensure that the data shown on food balance sheets are real, it is necessary to ensure that they are based on exact statistical information regarding agriculture and trade foodstuffs. The validity of these data are therefore subject to this important requirement. In any case, food balance sheets serve the purpose of providing a uniform procedure in order to achieve a greater degree of comparison between the data of different countries.

16. If the data shown in food balance sheets are of a general nature and calculated on an average, they cannot show the supply of foodstuffs to the different socio-economic groups which make up a country, and there in lies the nutritional problem of Latin America. We need, then dietary surveys to complement the data.

17. FAO has published a Handbook for the Preparation of Food Balance Sheets in which a detailed explanation is given of their usefulness, methods for calculating and verifying data, and which includes an example of food balance sheet together with a general classification of products.

18. Food consumption surveys provide a greater knowledge of the food and nutritional realities of an area, a country or a region and its different social and economic strata. That is to say, they study the distribution of available foodstuffs amongst inhabitants. It is recommended that such surveys be repeated periodically in order to determine consumption trends over a year and their seasonal variations.

19. Food consumption surveys should be based on samples which are statistically representative of the population, taking the family as a unit. A thorough study may thus be carried out of the consumption of foodstuffs in different regions and social strata, as well as the reasons of the population's nutritional problems and the economic and cultural aspects which aggravate them. It is, moreover, indispensable to carry out food consumption surveys in both urban as well as rural areas since each has its own problems, the solution of which can be more efficiently determined by using the information gathered during these surveys.

20. FAO's "Program of Food Consumption Surveys" is an useful guide.

21. Table VII shows food supplies levels per caput by caloric and protein content per person for selected countries in the region in the postwar period. It may be observed that although, in such countries as Argentina, Brazil, Mexico and Peru, certain quantitative improvements have been achieved, as regards the caloric value of diets, the quality of the average diet in relation to the total consumption of proteins and animal proteins has remained stationary or even shown a downward trend.

22. Table VIII shows results of some surveys on food consumption carried out in several countries of the region. They are of far greater significance that the national averages since they indicate differences in supply which can be observed between the different economic and social groups of one country and between cities and rural districts. This table indicates to what extent food supplies and, therefore, their consumption, are unevenly distributed amongst the different socio-economic and geographic strata of the population.

TABLE VII

CALORIES AND PROTEIN CONTENT OF ESTIMATED NATIONAL AVERAGE FOOD SUPPLIES PER CAPUT IN SELECTED LATIN AMERICAN COUNTRIES

	Calories	Protein	
		Total	Animal
	(Number/day)	(grams/day)	
Argentina			
1948 - 1950 (Average)	3.240	110	66
1954 - 1956 "	2.990	97	57
1957 - 1959 "	3.090	98	57
1961 (T)	2.860	84	54
Brazil			
1948 - 1950 (Average)	2.360	63	24
1954 - 1956 "	2.520	62	18
1957 - 1959 "	2.580	61	19
1961 (T)	2.790	65	18
Chile			
1948 - 1950 (Average)	2.370	71	23
1954 - 1956 "	2.550	79	28
1957 - 1959 "	2.440	80	29
1961	2.420	77	28
Colombia			
1957 - 1959 (Average)	2.010	46	22
1961 (T)	2.070	46	20
Dominican Republic			
1959	2.080	49	20
Ecuador			
1957 - 1959 (Average)	1.780	45	15
1961 (T)	1.970	50	16

TABLE VII(cont'd)

	Calories (Number/day)	Protein Total (grams/day)	Protein Animal (grams/day)
Honduras			
1954 - 1955 (Average)	2.260	57	12
1962 (T)	2.340	58	15
Mexico			
1957 - 1959 (Average)	2.410	67	20
1961 (T)	2.680	75	24
Paraguay			
1957 - 1959 (Average)	2.400	64	24
1961 (T)	2.440	60	24
Peru			
1957 - 1959 (Average)	1.960	49	12
1961 (T)	2.170	54	12
Uruguay			
1948 - 1950 (Average)	2.900	95	61
1954 - 1956 "	2.960	96	62
1957 - 1959 "	3.020	95	62
1961 (T)	2.980	95	62
Venezuela			
1957 - 1959 (Average)	2.170	61	24
1961 (T)	2.340	60	22

(T) Tentative

Source: FAO Food Balance Sheets.

TABLE VIII

ACTUAL CALORIE AND PROTEIN INTAKE IN SELECTED LATIN AMERICAN COUNTRIES
(Food Consumption Surveys)

Brazil 1/ 1961	Socio-economic Class		
	Very Poor	Poor	Middle Class
Calories p/caput/day	1.522	2.067	2.177
Total protein (g) p/cap/day	41	60	68
Animal " " " "	20	29	31

Chile 2/ 1962	Rural Areas				
	Coquimbo	Santiago	Ñuble	Chiloé	All Groups
Calories p/caput/day	2.500	2.670	2.060	2.736	2.571
Total protein (g) "	76	84	69	96	82
Animal " " "	23	28	17	44	28

Colombia 3/ 1956 to 1962 (15 surveys)	Urban				Rural			
	Very Poor	Poor	Middle Class	Well-to-do	Very Poor	Poor	Middle Class	Well-to-do
Calories p/caput/day	1.538	1.909	2.183	2.321	1.535	1.851	2.138	2.403
Total protein (g) "	34	47	60	67	30	42	52	63
Animal " " "	15	23	33	38	9	16	22	29

Costa Rica 4/ 1950	Urban	Suburban	Rural Town	Rural Farm
Calories p/caput/day	1.987	2.186	1.843	1.889
Total protein (g) "	59	56	47	48
Animal " " "	18	10	10	7

Ecuador 5/ 1953/54	Sierra			Litoral	
	Otavalo	Cotocollao	Cuenca	Quinindé	Manta
Calories p/caput/day	1.697	1.705	1.843	2.035	1.543
Total protein (g) "	55	51	53	56	54
Animal " " "	2	19	20	29	35

TABLE VIII (cont'd)

Mexico 6/ 1958/59	Rural			Suburban	Urban
	Very Poor	Poor	Middle Class	Poor	Middle Class
Calories p/caput/day	1.788	2.091	2.275	1.803	2.331
Total protein (g) "	45	63	57	51	64

Peru 7/ 1951 to 1958 (30 surveys)	La Costa	La Sierra	La Selva	All Groups
Calories p/caput/day	2.205	1.754	2.108	2.068
Total protein (g) "	64	47	62	59

Venezuela 8/ 1945	Caracas		1954	Caracas
	Clase Obrera	Clase Media		Familias de Barrios
Calories p/caput/day	2.070	2.182		2.136
Total protein (g) "	70	76		61
Animal " " "	27	35		Not given

1/ Mr. Zouain, et al: Inquérito sobre hábitos e recursos alimentares. Estudo da alimentacao e condicoes economico-sociais realizado no povlado de Currais, municipio de Nísia Floresta.- Rio Grande do Norte, (Ministério da Saúde, Comissao Nacional de Alimentacao, agosto de 1961)

2/ E.Rosales, et al : Encuesta Piloto de Alimentación Campesina. (Nutr. Brom. Tex., Vol. II, No.2, pp. 89-97, 1963)

3/ Instituto Nacionalede Nutrición : Informe de Colombia a la Reunión Técnica Latino-Americana sobre encuestas alimentarias (22 a 30 de abril de 1963)

4/ INCAP-FAO Co-operative Study: Living conditions in Four Population Groups in Central Costa Rica. (Span. version publ'd Boletin of the Panamerican Sanitary Bureau, Nov. 1954)

5/ M.J. Thomason, et al: Dietary Studies in Ecuador. (Am.J.Clin.Nutr., Vol.5, pp. 295-304, 1957)

6/ National Nutrition Institute, Mexico

7/ C.Collazos Chiriboga, et al: La alimentación y el estado de nutrición en el Peru (Anales de la Facultad de Médicina, Vol. XLIII, No.1, Marzo 1960)

8/ J.M. Bengos : La alimentación de las clases obrera y media de Caracas, Appendix IV, Tables 53 and 54.

H.González S.: Una encuestra alimentaria en 201 familias de Barrios de áreas Metropolitana de Caracas, 1954, pp.72,73, Cuadro 22,23.

23. The following paragraphs summarize the results of food consumption surveys in some Latin American countries. The region can be divided in five sub-regions, each including countries with some analogies in their levels and patterns of food consumption :

(a) Mexico, Central America
(b) North and Western South America - including Venezuela, Colombia, Ecuador, Peru, Bolivia.
(c) Southern Countries - Argentina, Chile, Paraguay, Uruguay
(d) Brazil
(e) Caribbean Region

(a) Mexico and Central America

24. Average calorie levels range from around 2.200 calories in the Central American countries to about 2.500 in Mexico. These figures are close to nutritional requirements, but if allowance is made for irregularities in the distribution of supplies among the different economic groups, it appears that some sections of the population have very low levels of consumption. Those findings are substantiated by a few food consumption surveys showing consumption levels as low as 1.500 or 1700 calories. In spite of this fact, however, the main general problem in most of Central America seems to be the lack of adequate supplies of protein and iodine. The protein shortage is reflected in the relatively high incidence of the "Sindrome pluricarencial infantil", a form of protein malnutrition, and the low level of iodine in the prevalence of endemic goitre. Infant death rates, particularly in the age group 1 to 4 years also confirm the existence of serious nutritional deficiencies among children.

25. Food consumption surveys carried out by INCAP in Guatemala and Costa Rica indicate low levels of animal protein, a high proportion of calories derived from carbohydrates, while the proportion from proteins and fats is low. The levels of intakes of calcium, vitamin A, riboflavin, and Vitamin C are low.

26. In Honduras a food consumption surveycarried out in 1962 revealed very low levels of consumption both in urban and rural areas of the Central Zone: the groups defined as poor in the urban area have levels of consumption which appear to be below 1.500 calories, with 15 g. of animal protein. In the rural area the average calorie consumption was 1.800 calories, but 75% were derived from carbohydrates against 65% in the urban areas.

27. In Mexico the calorie levels are more in line with average per caput requirements, that is 2.500 calories, of which about 50% come from cereals(mainly maize) and the quality of the diet, measured in terms of the protein intakes, is in general good : 45 g. of protein per caput per

day, of which 20 g. are of animal origin. There are prospects to increase fish consumption through campaigns of consumer's education which have proved to be successful in this country. Also milk consumption could be expanded, since in the last few years there has been a steady increase in livestock production and numbers. In fact, Mexico is together with Venezuela the country where most supplies have increased sharply during the last few years, and the trend of consumption of vegetable foods during the last decade also reflects the general increase of agricultural production.

28. Food consumption surveys carried out recently in the country by the National Nutrition Institute show levels of consumption in general lower, but still comparable with the overall average. A series of about 20 surveys shows levels of caloric intake ranging from 1.620 for very poor rural populations to above 2.300 for groups such as suburban-poor and urban-medium.

(b) North and Western South America

29. Under this heading are grouped countries with rather wide differences in the patterns of consumption. They are alike regarding the level of calorie intakes, which range from about 2.000 in countries like Bolivia and 2.200 in Ecuador, Colombia and Peru. The staple food in most countries including Venezuela, Colombia and Peru, is maize.

30. (i) Venezuela.- Since the years immediately after the Second World War, caloric intakes have been increasing slowly but steadily from some 2.000 calories in the early 1950's to around 2.300 calories recently. In the same period the level of protein intake has increased from around 55 to 65 g. and animal proteins have risen by some 7 or 8 g. to reach a level of about 22 g. at the present time. Most of this increase is due to a rise in the consumption of meat of the order of 6 Kg. per caput in the last ten years to reach a level of about 25 Kg. in 1959/60.

31. (ii) Colombia.- The levels of production and consumption in Colombia seem to be stationary. Agricultural production appears to be increasing at a lower rate than the population. The average per caput caloric intake is of the order of 2.280 with 46 g. of total proteins and about 20 g. of animal protein. Maize is the staple food, but raw sugar (panela) makes a substantial contribution (over 800 calories) to the energy value of the diet. Since a large proportion of the population lives in rural areas and is primarily dependent on production of maize, starchy roots, beans and panela, with limited access to money income, it is apparent that the diet of rural populations has been deteriorating, while that of urban areas has been more or less stationary. A series of food consumption surveys carried out in 1956/57 gives some idea of the levels of consumption in relation to the economic level. As was to be expected, the consumption of staple foods bore little relation to the

socio-economic level, while consumption of protective foods varied considerably with the economic status. It is significant that milk shows the closest relation. The calorie intake shows also a very close relationship with the economic level, both in urban and rural areas. In both areas levels of intake as low as 1.500 appear in the lowest economic groups, whereas, the overall average of the six surveys - around 2.000 calories - is in line with the information derived from other material, for instance, food balance sheets.

32. The uneven distribution of supplies is mainly responsible for deficiencies of calcium, riboflavin, Vitamin A, thiamine, and niacin.

33. Ecuador.- The average energy value of the diet is around 2.200 calories, with 50 g. of total proteins and 16 g. of animal protein per caput per day. The pattern of consumption is different in the highlands (Sierra) and the coastal areas. In the highlands, the main sources of energy are maize, roots, and pulses, while on the coast more wheat, rice and bananas are eaten. Goitre exists as a consequence of low levels of iodine in the diet. The dietary surveys carried out mostly in the highland areas show inadequate calorie levels and low protein intake, the major part of the latter being of vegetable origin. Consumption of calcium, riboflavin, and Vitamin A is deficient.

34. Peru.- According to the diet of the population, Peru can be divided into three areas: the Northern region, where the main sources of energy are rice, cassava, bananas and plantains, appears to be the area with the highest calorie and protein intake. In the Sierra, between the coast and the jungle, the average per caput intake of calories appears to be less than 2.000 and is heavily weighted by maize and starchy roots. In this area nutrition deficiencies arise both from low levels of consumption and inadequacy of diets. In the third area (tropical forest) diets are slighly better because hunting and fishing make a substantial contribution. An important source of calories is plantain. On the average, the calorie level of the country appears to be of the order of 2.000 which seems rather low, when unequal distribution of supplies is taken into account. Protein intake is also inadequate, averaging around 40 g., of which only about 12 g. are of animal origin. A few surveys carried out indicate also marked deficiencies of calcium, roboflavin and Vitamin A.

35. Remedial measures are, of course, of a different nature for the three different areas of the country, but in general should include an increase of more than 20% in the calorie intake and substantial additional amounts of foods of animal origin.. In this respect fish, which is plentiful and readily available in the coastal zone, could make a substantial contribution. Measures to educate the population on the nutritive value of this food could increase significantly its consumption. Consumer's education could also contribute to increase

significantly its consumption. Consume's education could also contribute to increase consumption of eggs and milk, which are produced by many rural families and sold as a source of cash income.

36. Bolivia.- Very little is known of the food situation in Bolivia. National estimates put the calorie level at less than 2.000 with extremely low levels of animal protein. Since agricultural statistics are not well developed in this country, the basis for such estimates is not very sound, and any conclusion derived from them is subject to large margins of error. At any rate it is believed that Bolivia has one of the lowest food and nutrition levels in this sub-region, and that applies especially to the rural areas and the poor sections of the urban population.

37. The indigenous population is a basic problem in Peru, Ecuador and Bolivia, where approximately 50% of the population consists of indian people who have kept their living habits intact since the precolombian period. In the mountain areas inhabited by "indios", arable land is very scarce, and the unemployment prevailing is a result of illiteracy, poor living conditions, as well as of defective dietary habits and taboos, which are all factors based on or associated with their special social and cultural background.

38. Indians live on the food they can produce, because due to primitive methods of work, and poor salaries their money resources are insufficient to buy other foodstuffs and any milk or eggs available from domestic production are sold to acquire essential articles. On the other hand, both the economic and the health conditions are hampered by a high consumption of coca, as well as of toxic, fermented and alcoholic drinks. Endemic goitre and parasitic intestinal diseases are also widespread in those areas. In addition to this, the indigenous population does not know the importance of nutrition and prefers to spend on alcohol and feasts. (A common characteristic of underprivileged minority groups, even in economically developed countries)

39. An extensive educational campaign is now under way to improve both consumption and food production by the indigenous population in order to incorporate tem in the active development of the country. This educational program is actually being carried out by the Andean Mission and FAO in Ecuador, Peru and Bolivia, through expanded nutritional programs and community development at school and family levels.

(c) Southern Countries

40. This group really includes countries with two different levels of consumption: The truly River Plate countries - Argentina and Uruguay - with levels of consumption of 3.000 calories and 60 g. of animal protein; and Paraguay and Chile, with around 2.500 calories with over 25 g. of animal protein.

41. Argentina and Uruguay.- Even in Argentina and Uruguay, where consumption of animal products - especially meat and milk - is as high as in the most developed countries of the world, there is much inequality in the distribution of food supplies between regions and socio-economic classes, that problems of malnutrition do exist. Both Argentina and Uruguay on the average consume around 100 Kg. per caput per year of wheat, over 100 Kg. of meat and more than adequate supplies of milk (125 kg. in Argentina and 180 in Uruguay).

42. Paraguay.- The level of food consumption seems to be quantitatively adequate: energy consumption is in excess of 2.500 calories with a large proportion coming from starchy roots; cereal consumption is of the order of 80 kg. and the combined contribution of cereals and roots to the calorie level is 60%. Around 60 kg. of meat and 60 kg. of milk per caput per day contribute the 24 g. of animal protein. In spite of this relatively high average level, protein deficiencies are found, as well as noticeable deficiencies of calcium, Vitamin A and riboflavin.

43. Chile.- The other southern country with a medium to adequate food supply, is Chile, with an average of 2.440 calories per day, per person, and 29 g. of animal protein (1957/59). Although the levels of protein are comparatively high among the countries of the region, there is still much room for improvement, especially between the lower income groups of the population. Food consumption survey carried out by official agencies and the ICNND groups (U.S.A.) shows that a significant percentage of low income families do not receive adequate caloric and protein intake. Among 277 families of 15 chilean cities interviewed in this survey (1.640 persons and 5,9 per family) it is discovered that 37% of them have that low caloric income. This confirms the food consumption survey of Dragony and Munet (1935) that among 601 families (3.377 persons and 5,6 per family) 39% of them receive less than 2.000 calories per day per person, in spite that the preferred food consumption of chilenn population, generally speaking, are cereals, sugar and potatoes.

44. Fish consumption has been increasing steadily (see appendix IV) and, since this is a food well accepted by the population and the long coastline accounts for large supplies of fish, there are considerable possibilities for fisheries development, both from the technical and the economic points of view.

(d) Brazil

45. The National Food Commission has fixed the necessary caloric intake for the Brazilian population at 2.300 - 2.400 calories per day per person, whilst stipulating that in the case of manual labour, this should be increased to 4.100 calories. This figure is broken down as follows: 15% proteins, 65% glicids and 20% lipids. In turn the protein intake should be made up of 40% of animal origin according to the economic scale and 60% of protein of vegetable origin.

46. From 1954 to 1959 the food availability for the Brazilian population was of 2.600 calories of which proteins claimed 217 calories and lipids 475 calories and which only included a bare 19 grams of proteins of animal origin. These figures were confirmed by food consumption surveys carried out particularly in the North-East. They indicate a caloric deficit of 7%, a deficiency of 42 grams of proteins especially of animal origin, and a 29% deficiency of lipids.

(e) Caribbean Region

47. A summarized account of food consumption is given in the report of the Caribbean Nutrition Seminar, as follows: "The calorie levels ranged from 1930 to 2.700 per caput per day, while those of protein ranged from 44 to 58 grams per caput per day, with approximately two thirds derived from foods of vegetable origin... Rice forms an important part of the diet in British Guiana, Surinam, Trinidad and Puerto Rico... Wheat flour is imported from North America in consierable quantities... Peas and beans are popular but their increased consumption should be encouraged... As sugar is produced in many parts of the region, it is consumed in relatively large quantities... In most of the region the consumption of milk is comparatively low and is rectricted mainly to infant-child feeding... Fish and other sea foods paly an important role in the diet on coastal areas... Due to limited facilities for cold storage and transportation, there is a little opportunity for supplying remote areas with fish, even where there is an abundant supply in coastal areas... Locally produced meat is inadequate in quantity and is often of inferior quality... Substantial quantities of meat and fish are imported... In general the quality of the diets if far from satisfactory... Intake of protein, especially animal protein, and of the necessary vitamins is low".

B. Maternal and Child Nutrition

48. Special consideration should be given to the nutritional requirements of expectant and nursing mothers in order to ensure the healthy development of their children right from the start.

49. During pregnancy the mother's nutritional needs increase and continue at this level during the nursing period. In Latin America, the duration of this latter period varies greatly from one country to another and even within the same country from one area to another; but, as a general rule, it can be said to be a year. During this time no discernible improvement has been observed in the nursing mother's diet; in fact, in some cases to to bad habits and concepts surrounding pregnancy and nursing the intake of cetain protective foodstuffs is reduced. For instance, in some parts of Brazil, mothers may not eat fruit for forty days after childbirth; in other countries of the region it has been observed that pregnant women may not eat eggs in order to avoid a "dry" birth or not eat double fruit so as not to have twins and, what is more damaging to mother's health they eat less during pregnancy in order to have small child for an easy delivery. These and other beliefs make it difficult to carry out nutritional campaigns which aim at improving the mother's nutritional state during this critical period.

50. All these restrictions in the mother's diets result in a low calorie intake, iron, protein and vitamin deficiencies. Evidence of these deficiencies, particularly as regards calories and proteins, is the scant increase in weight of some women during pregnancy, especially in some rural areas of monoculture.

51. Anaemia is a problem which is often observed among pregnant women due to a lack of iron which becomes more and more pronounced with each succesive pregnancy. Anaemia due to iron deficiencies is also common among children due principally to parasitosis.

52. Children under one year of age who are breast-fed for all this time are not so likely to sufer from malnutrition; but where mothers for one reason or another nurse their children for less time, providing them afterwards with a nutritionally deficient diet, these children enter upon a road which leads ultimately to malnutrition and marasmus, particularly among economically vulnerable segments of the population.

53. Children suffering from severe protein deficiency or marasmus die during this period due to complications such as bronchopneumonia, diarrhea or infectious diseases which are the cause of countless deaths as is registered on medical certificates. It is for this reason that mistakes have often been made when setting-up programs for infant welfare based solely and exclusively upon death certificates.

54. In Latin America, the most common form which under-nutrition takes amongst infants of less than a year of age is marasmus and, in the age group from 1 to 4 years, severe protein malnutrition (Kwashorkor) together with various intermediate states between the two illnesses It has been confirmed that in some areas of Latin America especially in rural districts, 4% to 6% of the children are afflicted by severe forms of malnutrition and 50% by intermediate forms of caloric and protein deficiencies. In fact, in many countries of the region, over 50% of the patients entering hospitals are children of under 5 years of age with serious nutritional ailments.

55. The child who manages to survive continues his deficient growth and bad health due primarily to dietary deficiencies. If the comes from a poor family he will have to find work in order to help support the family. From the nutritional point of view it is a recognized fact that regular physical labour is a drain on the organism and, in the case of a child or an adolescent, this would mean over taxing a growing organism. Consequently, the results of a diet which is already unbalanced and has insufficient calories and proteins causing organic disturbances and a deficient nutritional state, are further magnified.

56. Preliminary studies have been made of certain low income groups whose diets are nutritionally deficient, which indicate that mental development decreases after birth and remains at sub-normal levels though childhood and adolescence seriously hampering the children's ability to learn and develop intellectually. As adults they lack initiative and interest in taking part in any kind of activity which demands effort and slide into a state of social and economic inertia.

57. Another of the region's serious problems is the widespread prevalence of endemic goiter. In most Latin American countries there are areas, generally in mountanous districts, where over 10% of the population is afflicted with this desease thus constituing an extremely serious public health problem. In some provinces of Argentina the prevalence of endemic goiter is of 70 to 80%; in Bolivia it varies between 40 and 60%; in Brazil, in the State of Minas Gerais, it is to be found in 44% of the population; in Colombia it reaches an average of 50%; in Perú in the Sierra districts 64%; and in Venezuela between 10% to 80%. Porcentages in the remaining countries of the region are comparable. This lack of iodine has disastrous mental and physical effects on children and young people in these areas.

58. The most frecuent forms of vitaminosis, specially among the nutritionally vulnerable groups (mothers and children), are those of vitamin A and Vitamin B complex. The acute deficiency of vitamin A and proteins produces eye organic diseases which lead to blindness, a situation well known in some areas of Central America. Although the

Vitamin B complex is not generally serious enough to produce specific symptoms, they nevertheless affect the general state of health of the population.

59. There can be no doubt as to what must be done is to improve the diets and nutritional state of infants, children, youth and mothers of Latin America. It is also necessary to initiate measures designed to improve the population's income levels thus enabling them to purchase and consume a more balanced diet which should, in turn, be ensured by improved food supplies and nutrition education. That is to say, great attention should be paid to many socio-economic aspects which have a definite influence upon the satisfactory nutritional state of the population. However, special attention must be given to the development of good dietary habits whose influence will be felt throughout the family. Hence, the importance of educational programs which will teach mothers to provide an adequate and balanced diet for themselves and the members of their families and, in turn, will effect the pattern of home production and protective foods in the subsistence sector of the rural economy. That is to say, when trying to improve the dietary and nutritional conditions of the Latin American population, the focal point should be the family and through it the improved nutritional health of children and youth people.

III. EDUCATION IN NUTRITION AND NUTRITION PROGRAMS FOR CHILDREN

60. Educational programs in the field of human nutrition are carried out in Latin America in order to improve the nutritional state of the population, paying particular attention to children and other "nutritionally vulnerable" groups, by getting them to adopt correct nutritional habits.

61. In order to achieve this aim, three types of programs are employed, either simultaneously or successively: i.e. programs of food and nutrition education, complementary feeding programs and the so-called 'applied nutrition' programs.

62. The programs of food and nutrition education have the advantage of promoting production and/or consumption of certain nutritionally valuable foods and of improving the attitude and conduct of beneficiaries towards feeding. Complementary feeding programs are generally integrated with those mentioned previously so that their results may be continued beyond the program itself, for complementary feeding programs are " per se " only useful for as long as the supply of food exists. It is a generally accepted policy, at present, that complementary feeding programs undertaken with free distribution of supplies or with low-cost protector foods, should only be used in special emergencies. But if their use can be ensured for a longer period, they should be used to promote nutrition education within a community. Finally, the so-called 'applied nutrition' programs have a methodology based on active education to promote both the production of protector or complementary foods of a diet, as well as to improve their consumption by every sector of the population and to enable these to have a better balanced diet of a greater nutritional value, taking the maximum advantage of the family budget.

63. Another important objective of these applied nutrition programs is that of promoting close and adequate coordination of activities between the various agricultural, educational, health and other services whose responsibilities fall within the field of human nutrition.

64. The three types of programs mentioned are being carried out in almost all Latin American countries: Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Honduras, Nicaragua, Panama, Paraguay, Peru, Saint Kitts, Saint Lucia, Trinidad and Tobago, thanks to the government's interest and the proficiency of the national personnel participating in these programs. In most cases the technical and financial assistance of United Nations Specialized Agencies (FAO, WHO, UNICEF, UNESCO, ILO) is provided.

65. That is to say, the programs of food and nutrition education are using every means of communication at their disposal in every country in order to reach each member of the family. Those most used are agricultural extension services, primary schools, health centres, parents' centres, country youth centres and every other type of social centre, especially those in rural districts.

(a) Methods and techniques employed

66. The methods and techniques used in food and nutrition education are selected according to the country, region or area in which the program is to be implemented. In some mass media are used (newspapers, radio, television), in others group or individual methods are employed (lectures, films, slide shows, pamphlets, signs, etc.) Methods used in every case are informal talks, classes, lectures and demonstrations.

67. The education of the pre-school age child is generally accomplished through the knowledge imparted to the mother, although some experiments have been carried out on the effectiveness of approaching groups of pre-school age children directly.

68. The education of school age children is always undertaken by the school itself: the theoretical aspect is incorporated into the school curriculum, and the practical aspect is implemented through the school's complementary feeding program, either breakfast (a glass of milk) or lunch, or through the produce of the school gardens.

69. This education is transmitted to the families through the school clubs and other clubs for mothers and youths.

70. For education in the schools to be efficient, it is necessary that the techniques be presented to the teachers by training in the methodology for teaching these subjects either in the normal schools or through in-service training, as is already being done in Ecuador and Brazil.

(b) Types, scope and organization of the programs

71. We will take as example some of the countries mentioned before in which nutrition and food education programs are being carried out and where substantial results have been achieved.

Costa Rica

72. In Costa Rica ten years ago the formation of organized centers to provide assistance to mothers, infants and pre-school age children was promoted by previously creating an awareness in the respective communities, the so-called "nutrition centers" were formed, of which

more than 80 are in operation at present. They are spread all over the country and the participation of national, local and community institutions is excellent. The National Institutions provide the necessary amounts of powdered milk and the others food; the local institutions provide the buildings in which those centers operate plus a monthly contribution for administrative expenses; the community participates through a committee which supervises the proper operation of the center and collaborates in the preparation and distribution of the food. In addition to donating food, educational programs are carried out based, particularly, on practical demonstrations on the preparation of food lacking in the daily diet and which can easily be obtained locally. These programs are carried out through the Nutrition Department of the Ministry of Public Health.

73. Through the complementary feeding programs carried out by the above cited institutions, school children are served a glass of milk daily, prepared with powdered skimmed milk. Over 120,000 children receive this food complement, i.e. over 80% of the registered school population. Cheese and margarine are also periodically supplied together with the milk, and the schools themselves occasionally obtain other foods which are essential to the program.

74. All these activities include food and nutrition education to the school children and their parents through meetings which are mainly held for the purpose of carrying out demonstrations on the domestic preparation and preservation of foods. Over 450 meetings have been held during the last ten years in which more than 35,000 persons participated.

75. In order to have trained personnel for the development of these school programs, basic nutrition courses are offered to the students of the Pedagogic School of the National University and of the Normal schools. So far, four of these courses have been held at the University with the attendance of 340 students and 20 at the Normal schools in which 1.060 students participated.

76. An applied nutrition program called "Nutrition & School Gardens" has been in operation for the last four years, with the coordinated participation of the ministries of Agriculture, Health and Education. It was started in a pilot area with 45 communities which included as many primary schools and has now been extended to 80 communities with the same number of primary schools and three normal schools.

Ecuador

77. In Ecuador, the food and nutrition education program has been carried out especially in secondary and primary schools. One of the first activities carried out under this program was the training of 107 biology teachers in courses which lasted four weeks, as the subject of nutrition was incorporated with biology in the fourth year of all the secondary schools from the Sierra to the Coast. A manual of human nutrition was prepared to be used as a text for this type of training and also a booklet called "Sugerencias y Ampliaciones para la Enseñanza de la Nutrition en los Colegios de Bachillerato" (Suggestions and Expansion of Training in Nutrition for Secondary Schools), which contains pedagogic guidelines, complementary subjects and practical exercises for use by the teachers. All urban schools have also included the subject of nutrition in their curricula.

78. Food and nutrition education in rural schools was started with a pilot plan in a demonstration school for which two manuals have been prepared, one for teaching in the first and second grades and the other for the third and fourth grades. Both have been integrated with the study plan.

79. An applied nutrition program is being carried out in six provinces in the Ecuadorean sierra which are within the area of the Andean Mission. This program is carried out through a complementary feeding plan supplying powdered skimmed milk to more than 4.000 children in 80 primary schools and lunch to 60 children belonging to the fifth and sixth grades in three nuclear schools.

80. Thus, theoretic training in nutrition and food has been started in the primary schools of the areas where the program is being carried out, integrating it with the different subjects of the curricula. Eightyfour teachers were trained prior to this integration in a course of four weeks duration.

81. Another aspect of education in nutrition and food is carried out at the community level through Housewives' Clubs, by carrying out demonstrations on the preparation and preservation of good quality food of high protein content, minerals and vitamins. This program is carried out through the Health Centers of the Ministry of Health and Social Security and through the Andean Mission in rural areas.

Colombia

82. The nutrition education programs in Colombia have attained their maximum development in the faculties of medicine, nursing and home economics and in normal and assistant nurse schools. More than 900 students have been trained in courses of different lengths since July 1963 to June 1964. In addition, in-service training was provided to more than 1.700 people belonging to the different health, agricultural, educational and community development centers. Mass dissemination of information at the community level has been carried out through more than 400 radio and television programs.

83. An applied nutrition program (PINA) was started in one of the government's departments in 1961 and has since been extended to ten of the fifteen departments. As part of this program complementary feeding of more than 2.700 mothers and pre-school aged children has been carried out with powdered skimmed milk and over 4.300 families have been provided with other foods; in addition, over 80 school restaurants have been organized. The National Nutrition Institute is the principal promotor of these applied nutrition programs in Colombia.

84. Some 900 lectures and demonostrations on food preparation were carried out simultaneously with the complementary feeding program. Approximately 14.000 people attended these demonstrations. School children, approximately 5.000 have also received instruction through this type of lecture of which more than 50 have been delivered.

Paraguay

85. In Paraguay activities related to food and nutrition education programs have been concentrated in the Food and Nutrition Education Program (PAEN). Under this program action is carried out at the school level from where it is projected to the community through the "local committee" composed of elected community representatives. PAEN operates in those communities where there are schools offering complete primary education. At the same time excellent coordination has been established between the agricultural, educational and health sectors at the national level as well as at the provincial and local levels.

86. PAEN has obtained excellent collaboration from the community, which provides the school with a hectare of land for the garden, fruit orchard and forest-tree nursery. At present the program includes 140 rural schools with the active participation of approximately 90.000 children who are benefitted by the school lunch and a glass of milk a day, prepared with powdered milk, as complementary feeding.

87. The supervision of the program is in charge of a professional staff of 50 people composed of agronomists and home improvers (home economists without university degrees) This team is established in the interior of Paraguay where PAEN is being carried out. Its fundamental role is to motivate the community to collaborate in this program and coordinate the action of community leaders, in addition to its supervisory responsabilities and permanent evaluation of the program.

88. The management of PAEN in each community is in charge of a Committee composed by representatives from the three ministries. In turn, these local committees are supervised by zonal committees established at the provincial level and a central comittee which directs activities through an executive secretary.

89. Local commissions formed by the community leaders also function at the local level in close collaboration with the local committees.

90. Through this technical and administrative structure, the program is oriented towards technical and practical teaching of proper feeding by improving local production and consumption of food.

91. Teachers and community leaders participating in PAEN are also trained under this program through courses of one month's duration. Special courses on poultry, horticulture and silviculture have been held.

92. Schools participating in the program have received organic fertilizers, tools for the school garden, sewing machines for non-schools clubs, seeds, insecticides and fungicides. Special pumps were installed in schools where there was no water.

93. The area of influence of PAEN is of approximately 5.000 km2 with some 900.000 inhabitants, excluding the Asunción area. In other words PAEN covers 12% of the Paraguayan territory in which over 50% of the country's population lives.

94. Until November 1964, 140 schools had enough land for gardens, of which 131 had water from wells installed through the program. All of the schools had gardens and 42 had poultry farms. There were 138 active school clubs, 138 non-school clubs and 138 active communal commissions. In addition, to the glass of milk being distributed in the shools, health centers and sanitary posts, vitamin and ferric sulphate capsules and tablets are distributed through the health centers whenever necessary, especially to pregnant mothers and infants.

(c) Evaluation of the current programs for improving the food and nutrition situation of the children

(i) Status of Program Evaluation.

95. The food and nutrition education programs have not been systematically evaluated. Some efforts have been made to evaluate the applied nutrition programs being carried out in several countries and, in spite of difficulties encountered, it has been possible to arrive at some general conclusions regarding planning, basic information, supervision and the positive need for such evaluation.

96. With respect to planning it may be said that, in general, plans were prepared within a very short period of time. Therefore, it was not possible to gather enough background information. Also, preference has been given to national rather than local information, thus the characteristics pertaining to the groups to be directly benefitted by the programs, have been excluded. Because of this lack of initial information or benchmarks it has been impossible to know what changes have taken place. With respect to supervision it may be stated that technical staff on some of the programs mistake evaluation for the simple control of activities and although it is possible to determine the direction in which the program is developing in order to take the necessary measures to improve its orientation, an ambiguity exists/ persists in the minds of program administrators and policy makers as to the real process of evaluation. Efforts should be made to clarify the procedures and usefulness of objective program evaluation through seminars and courses at all levels.

97. In the case of the new programs started in the course of last year, among which are the programs of the Central Sierra of Peru and the Northeast of Brazil, basic lines were set up prior to their establishment in order to make it possible to carry out the evaluation scientifically from the initial planning stages through the execution of the programs.

(ii) Some Provisional Conclusions from partial Evaluations.

98. The limited nature and scope of program evaluation so far, in regard to nutrition programs, only provide some general impressions. However, it appears useful to briefly state a few of them.

99. There is interest and good motivation at the Government level and at the level of the technical departments for carrying out this type of nutrition programs. Motivation in the communities where programs are implemented is greater than had been expected. In many cases, in addition to covering local nutrition needs, surpluses of protective foodstuffs were produced for marketing.

100. Unfortunately, due to budgetary difficulties affecting programs of a social nature in most of the countries of the region, it has not been possible to expand these programs to other interested areas. Problems of this type - even financial ones - have often been overcome with the co-operation of the communities which have helped to keep the programs going.

101. Furthermore, the staff of the technical departments participating in these programs feel that they offer an excellent opportunity for working in teams at the various levels, thus improving co-ordination of the activities in the field of nutrition.

102. A shortage of professional staff properly trained in nutrition has been observed in these programs in all the countries of the region. There are not enough doctors specialized in nutrition, nutritionists, home economics and auxiliary staff for these activities. Action has, therefore, been limited at the various supervisory and evaluation sectors of the different stages of these programs.

103. In any event, so that the professional staff of the agricultural educational and health sectors may carry out the programs established within these applied nutrition plans in the best possible manner, courses on food and nutrition are given at every level, i.e. for professional staff, in-service, as well as for professors of the faculties of agronomy, agricultural schools, pedagogic faculties and normal schools. Several regional courses on nutrition have also been carried out for professionals connected with these activities, especially agronomists and home economists who participate actively in these programs. (Latin American course at La Molina, Peru).

104. With respect to economists and policy makers, the FAO is collaborating with the Latin American Institute for Economic and Social Planning (Annual courses - Santiago, Chile) in giving lectures on food and nutrition, both under the agricultural programming and the human resources specialities, in order to integrate food and nutrition considerations into the national planning and enlighten them to give the priority that have the nutritional programs.

105. Interest has been greater for some specific projects within these food and nutrition education programs, such as school gardens, milk distribution, in-service training of professional staff, training of auxiliary staff and community leaders and preparation of educational material. All of these projects are at different stages of progress in the various countries and good results have been achieved due to which community interest continues to increase.

106. In general, it may be said that implementation of food and nutrition education programs in Latin America, particularly applied nutrition programs, are acceptable because they represent a positive step towards the solution of the various food and nutrition problems, particularly in rural areas. These programs constitute an effective mean for the dissemination of basic information of food and nutrition through modern methods, as they include not only the scientific aspects related to nutrition or the purely nutritive value of food, but also pay special attention to the cultural, social and economic aspect. But the important thing is not only whether these programs reach a good disemination on food and nutrition information, but whether that information is effectively utilized by the people to improve their nutritional status. Unfortunately, we do not have as yet a real evidence of changes in food consumption patterns. Nevertheless, in the last FAO document on "The State of Food and Agriculture 1965" in reference to Nutrition it can be read: " Increasing recognition has been given to the role and importance of nutrition education in influencing food habits and food consumption".

IV PLANNING FOR THE NUTRITIONAL NEEDS FOR CHILDREN

107. This Chapter is in two sections dealing with:

(a) Review and evaluation of the existing situation as regards such planning in the Region,

(b) Methods of planning for fulfilling the nutritional needs of children.

(a) Review and Evaluation of the Existing Situation as Regards Planning for the Nutritional Needs of Children in the Region

108. The fifth (1965) Session of the FAO/UNICEF Joint Policy Committee recognized that the problem of children's needs must be regarded as part of the total problem in planning to meet food and nutrition needs; population must be considered as a whole and it is difficult to single out the needs of any particular part of a family for special attention, including children.

109. In Latin America most of the governments have prepared plans for food and agricultural development as part of their overall programs for economic and social development. This provides a good opportunity to take into account the nutritional needs of their populations for formulating and implementing policies related to food production and consumption, including international trade in foodstuffs and marketing policies.

110. The FAO Regional Conferences for Latin America have repeatedly emphasized the role of nutrition in agricultural planning which is basic to the philosophy of FAO. Nutrition in this context has, therefore, received wide recognition in the last few years by Latin American governments. The Latin American Conference on Food and Agriculture (Eighth FAO Regional Conference) held in Viña del Mar in March 1965 paid special attention to the formulation of a food policy for economic development taking into consideration the nutritional requirements both in terms of nutrients and in terms of foodstuffs in relation to the existing patterns of consumption. There are a few countries in the region that have included nutritional objectives in their national policy making and planning related to food and agriculture.

111. In Argentina, the National Development Commission (CONADE) is attempting to diversify meat production and consumption with particular

reference to fish and small animals. It is also trying to ensure a better distribution of meat in order to increase its consumption in some provinces where protein deficiencies have been registered amongst the population. The National Nutrition Institute is at present carrying out dietary and clinic-nutritional surveys together with other socio-economic surveys in order to have a better knowledge of the problem, particularly in rural districts, on which to base a realistic policy aimed at solving it.

112. Bolivia, too, has borne in mind its population's nutritional needs when drawing up the section on food production and consumption of its ten - year plan. Moreover, interest is shown in diversifying and increasing production in the field of animal and vegetable proteins in order to satisfy the population's requirements.

113. In Chile, the Development Corporation (CORFO) in its development plans takes into consideration the nutritional requirements of the population among the basic planning objectives.

114. In Ecuador the National Planning and Coordinating Board, in its 10-year development plan (1963-1973), states that the nutritional improvements will be of great significance in the social and economic development. The plan foresees that foodstuffs will amount to 2,279 calories per inhabitant per day, that is to say, that an increase of 25% on the 1963 level,which was of 1.826 calories, would take place. Although the minimum requirements for animal proteins will not be achieved by 1973, the availability of vegetable proteins will surpass requirements. Likewise, the Planning Board mentions that whilst working to achieve an improved agricultural production, close attention should be paid to "supplying the internal demand for foodstuffs and the improvements of the population's nutritional level".

115. El Salvador has likewise based the part of its five-year development program, which relates to planning of food production, upon the needs of its growing population and has referred to nutritional requirements especially in the field of animal proteins.

116. CORDIPLAN, in Venezuela, is continuing its program of dietary and clinico-nutritional surveys in order to have available enough up-to-date information on dietary problems to put their plans for improving the national diet into practice. In view of the dietary problem related to the consumption of meat, it wishes to initiate better methods of meat distribution. From the nutritional point of view, it is reviewing its plans regarding a milk subsidy in order to estimulate greater and better milk production. It is attempting to keep track of and coordinate national human nutritional activities in Venezuela.

117. In Brazil, Colombia, Costa Rica, Guatemala, México, Paraguay, Perú and other Latin American countries, the state nutrition departments are collaborating extensively with the economic and social planning sectors so that the nutritional aspects of overall development programs are not overlooked, especially as regards satisfying the protein requirements of the population.

(i) Available data for food and nutrition planning

118. In spite of the awareness of the serious nutritional problems existing in the region, there is, however, a lack of knowledge of the exact degree of incidence of deficiencies, as well as about the levels of food consumption in different population groups.

119. Food balance sheets are available for 17 Latin American countries which will be published on the following 1965 production year book. In other cases they have been prepared but the publishing has been delayed.

120. National average consumption figures derived from food balance sheets conceal wide differences in consumption among groups of population, e.g. groups differentiated by locality, economic status, occupation and age. Such detailed information, which is often essential for nutritional purposes, can be obtained only through food consumption surveys of representative samples of the population concerned. Some countries have undertaken surveys of this nature and FAO's publication "Program of Food Consumption Surveys" gives a very useful guidance for designing these surveys for use in development planning. The paragraph 17 of the general paper on "Planning for Food and Nutritional Needs for Children (1965)" prepared for the Fifth Session of the FAO/UNICEF Joint Policy Committee, refers to as follows: "the Program of Food Consumption Surveys which is mainly concerned with nation-wide household consumption surveys, also recommends that food consumption surveys of groups, such as children, should be coordinated with surveys of the former type. Governments would, therefore, find it useful to follow the recommendations in this document for designing food consumption surveys to be used in development planning". Therefore, one of the problems which deserves special attention is that of the organization of comprehensive food consumption surveys that will bring up-to-date the information of national or region level.

121. Data on food habits and food expenditure are also limited in the region. More valuable information can be obtained by coordinating the efforts of those who are concerned with nutritional aspects of food consumption with those of economic aspects. For example, in Argentina the National Development Commission (CONADE) is working together with the National Nutrition Institute in carrying out dietary surveys, as was done in Brazil, Colombia, Ecuador, Mexico and others.

(ii) The link between planning organization and food and nutrition services

122. There is no doubt that the achievement of higher and better nutritional standard should be one of the basic objectives of national planning. For this purpose it is necessary to count on the collaboration of governmental nutrition and food services and to organize meeting which will bring planning economists into contact with nutritionists and with those responsible for establishing agricultural production goals and coordination into the national development plans.

123. In many countries no strong nutrition organizations or committees exist to direct and coordinate the various aspects of nutrition work, nor to advise on food policy. While Nutrition Institutes exist in some countries, many of these restrict their activities to research on clinic-nutrition. Few countries in the region have well-developed nutrition services to take the responsibility of practical nutrition activities which make use of the findings of this research.

124. Lack of personnel trained and employed as leaders and staff of national nutrition programs and as advisers on national food policy, is preventing Latin American countries from evolving measures to combat malnutrition. There is a especially urgent need for trained personnel specialized in nutrition in relation to food and agriculture in national development.

125. The need for a special structure for the coordination of national efforts has been recognized in Brazil, Colombia, Mexico, Guatemala, Costa Rica, Panama, Paraguay, and Peru with the establishment of statutory bodies (National Food and Nutrition Council) with the power to advise the highest authorities of governments on this matter. In any case, the coordination of action should be studied in relation to the political and administrative structure of each country and to the ways and means of involving them in food policy and planning as well as in other national programs to improve nutrition and to contribute to economic and social development. But, in general, coordination embraces mainly the ministries directly concerned with nutrition: agriculture, health, education, economic and the planning bodies. That is to say, the link between policy-making and planning organizations on the one hand, and food and nutrition services on the other, is essential to ensure the prompt and continous availability of proper nutritional advice.

126. But in spite of some encouraging examples, there is still a long way to go in many countries of the region before the goal of closely linking planning activities to nutritional needs can be achieved.

(b) Methods of Planning for Fulfilling the Nutritional Needs of Children

127. This item presents an attempt to outline the procedure for formulating and implementing a program to improve the food and nutritional situation of children within the framework of the family as a whole and the overall development plans.

128. The main premise underlying the suggested approach is that children's needs cannot be ascertained separately but only as a part of the families to which they belong. Similarly, a nutrition policy can obviously only be implemented through the family and through institutes such as schools, and not by the authorities in direct contact with the children themselves. Accordingly, the children's needs must be analyzed, targets and means to meet them must be determined and the cost assessed within the design of a nutrition program for the entire population, as built up on the basis of the family structure. The first three parts of this section deal with statistics, targets, and costs respectively. These are followed by an outline of a simplified approach to and the measures for implementing the program.

(i) Statistical research and projections

129. The formulation of any program for improvement of food and nutrition must be preceded by research to assess the existing position and to appraise the projected situation at the end of the plan period on the assumption that no special measures will be undertaken as regards children's nutrition, i.e., that the target for the end of the period will be based on average figures of consumption for the population as a whole. If the drafting of the plan has not been completed, a further stage is necessary whereby the projected target is compared with the ideal nutritional standards, for the main population strata, including children, and realistic targets set for the successive approximation to these standards by means of consistent policy measures. If, on the contrary, the plan has already been prepared and approved, steps of the kind already described should still be undertaken to give greater weight to institutional factors, and the targets of the plan, if at all possible, modified accordingly.

130. The first statistical problem is the definition and the measurement of the size of the population group for which the program ought to be designed. Ideally the program should cover children up to the age of 15 (inclusive) - divided into "nutritional" age groups - as well as expectant and nursing mothers. However, since it is not the children but the family who form the income-earning and food-allocating and consuming unit, it is also necessary to establish the number of families with children and the average size of such families. If possible, an

attempt should be made to analyse the distribution of families by age and number of children and in relation to their means to procure food, e.g. socio-economic status.

131. The next research task consists in the collection of information on the present level and pattern of food consumption by families with children. For this purpose, because of substantial differences in food consumption between families with and without children, appropriately stratified food consumption surveys are needed. Information is necessary on the manner and extent to which food consumption is affected by differences in family size, composition and income. Moreover, food distribution within the family should be examined. As a minimum rough estimates are necessary with regard to the main food items of nutritional importance which are consumed by children within the family.

132. In the same way, projections for the terminal year of the plan should include estimates of the size and structure of the relevant population group and its food consumption.

133. Projections of the number of families with children are not usually readily available. An alternative would be to estime, on the basis of the projected increase in total population, the number of families with children on the assumption that their percentage in total population and average size remain unchanged. In a medium-term plan (3 - 7 years) such assumptions appear permissible. In longer-term plans, demographic analysis is needed to provide the necessary projections.

134. For projections of food consumption, income elasticity of demand is the basic tool. As food consumption levels and patterns differ between families with and without children, the income elasticity of demand for food as a whole and for various food items also differs between the two family groups. Thus, with the same proportionate change in income, families with children are likely to increase the demand for milk, fruit and other items of children's diet relatively more than the childless families. However, low income levels and cultural factors may not materialize this. The relevant income elasticities of demand for food as a whole and for major food groups can be obtained from family budget surveys, provided that the two surveys distinguish between the two categories of families and are also cross-classified by economic status.

135. The future level average family income should be estimated in conformity with the objectives expressed in the overall national development plan. By applying the appropriate income elasticity coefficient to the change in income over the plan period, it is possible to estimate the expected level and pattern of food consumption by families with

children. In a more refined approach, private consumption expenditure rather than income, and the corresponding elasticity coefficient should be used.

136. An important difficulty, characteristic of developing countries arises from the fact that a large part of aggregate demand is satisfied not by market supply but by subsistence farming. In a subsistence economy, income elasticity coefficient is not a suitable tool for projecting the demand. Specific studies, therefore, are required to deal with the subsistence sector and its demand should be added to the market demand in order to obtain the projected aggregate demand for food by families with children as expressed by consumer preferences.

(ii) Nutritional targets

137. The projected food consumption by families, should be converted into calories, protein, fats, vitamins and minerals and the results compared with ideal nutritional requirements. In the light of this analysis and the projected supply situation, nutritional targets should be established which would be achievable over the plan period. The nutritional targets of medium-term plans should reflect the phasing of the long-term objective of achieving ideal nutritional standards. While the nutritional targets must be based on physiological needs, they should take due account of environmental, social and economic conditions.

138. The calorie requirements for various age groups have been established by the FAO Committee on Calorie Requirements. The recommendations concerning the standard calorie and protein requirements for infants and children, under standard temperature conditions (10°C) are summarized in Table IX.

139. If nutritional targets for children cannot be planned in isolation from the rest of the family, thus children's requirements for calories, protein, fats, vitamins and minerals should be added to the requirements of the adult members of the average family. In this way it is possible to calculate the total nutrient requirements of all families with children. This, again, from the national point of view will represent only a partial target which must be supplemented by nutritional targets for childless families. By successive aggregations of this kind, sound nutritional targets for the entire population can be set.

TABLE IX

Calorie and Protein Requirements by Age

	Age	Calorie requirements (Number per day)	Protein requirements (Grams per kilogram of body weight per day)
Infants (in months)	0-3	110 calories per kilogram of body weight	2.3
	3-6		1.8
	6-9		1.5
	9-12		1.2
Children (in years)	1-3	1.300	0.9 - 1.6
	4-6	1.700	0.8 - 1.0
	7-9	2.100	0.8 - 0.9
	10-12	2.500	0.7 - 0.9
	13-15	Boys: 3.100	0.7 - 0.8
		Girls: 2.600	0.7 - 0.8

(iii) Cost Analysis

140. A comparison of ideal nutritional requirements with the projected nutritional levels will normally reveal certain nutritional deficiencies. The purpose of nutritional planning is to eliminate gradually these deficiencies. To some extent, this can be achieved by more changes in the diet without any increase in total food consumption. More often, however, the necessary policy measures will involve certain costs. In both cases, therefore, an essential next step in nutritional planning is to determine the least-cost combination of additional nutrients.

141. Apart from the cost of production and distribution, the analysis should include the cost of influencing consumer demand, i.e. educating the population, especially the mothers, in the choise of the most rational diet, food preparation, cooking, storage, etc. A distribution, storage and cooking involve certain wastage of nutrients, suitable allowances must also be devised and applied in the calculation.

142. In determining the least-cost combination of additional nutrients the total contribution of each food item to all the required nutrients should be assessed. For example, if the diet is deficient in protein and riboflavin as well as in vitamin A and C, increased consumption of legumes will correct both the first two deficiencies and fruits and vegetables the second two. This does not however, take account of protein quality which might require some proteins of animal origin. Allowances should also be made for possible elimination or reduction in the intake of some food items caused by the proposed change. Thus, in the above example, increased consumption of legumes, fruits and vegetables, which also add to the caloric intake, would permit a reduction in the intake of roots and tubers. This procedure is more satisfactory than determining, on an individual food basis, the cheapest food for supplying each nutrient.

143. While, in theory, this approach would involve the consideration of an immensely large number of commodities, in practice, the number of food items would be fairly limited, partly because of the prevailing consumption habits and tastes, and partly because of the restricted amount of consumer's expenditure of food.

144. It must be noted that the restraint imposed by the projected volume of consumer's expenditure on food could be shifted upwards to some extent by government subsidies and foreign aid. These possibilities are particularly important as far as children's nutrition is concerned. International aid for this purpose, especially through UNICEF, is made increasingly available as shown in the Appendices.

145. Governments which realize that the national future primarily depends on full development of human resources may consider subsidizing children's nutritions. This can take the form of subsidies on production or consumption. Subsidies on production usually encounter the difficulties of directing production in the desired direction. Consumption subsidies may consists of family allowances in the taxation system, free distribution of certain food items to children and expectant mothers.

146. How much of the total cost of improved children's nutrition could be met in a current plan period will obviously depend on the priority accorded to nutritional objectives in the light of other objectives of the plan. Thus the planned financial allocation for improving the levels of nutrition in general, and of children in particular, will determine the speed with which the ideal nutritional standards are achieved.

(iv) A Simplified Approach

147. Since measures to improve the present low level of nutrition have to be formulated immediately, a less comprehensive, simplified approach is out-lined below.

148. A program could be formulated to raise the nutritional levels of children on a limited scale, e.g. in a particular district or for a particular group of children such as pre-school or school children. A small-scale survey could be carried out to provide the required information on the present consumption of food. Hospital, Public Health Centers and clinical records may also furnish some information on nutritional status. From such surveys and records, intakes of nutrients can be calculated, and their adequacy assessed by comparison with dietary standards. Even for such limited programs, some assumptions would have to be made regarding the future food production and availability. Total requirements to meet the deficiency could then be calculated on the basis of projections of population and children and appropriate programs.

149. The food alternatives in an area are more limited than in the whole country. This would tend to reduce the difficulties of choosing the least-cost diet conforming to the nutritional standards. However, the planner has to take into account the changes in the patterns of production and consumption which are often associated with economic development. Thus, the transition from a primarily subsistence economy to one more market-oriented tends to expand the range of available food products, which eases the nutritional difficulties of providing a balanced diet but aggravates the planning problem. Increasing attention is being given to the possibilities of involving youth them-

selves in food production projects, such as home gardens, poultry, small livestock, and other enterprises contributing to the adequacy of the family food supply.

150. Most developing countries in their nutritional programs for children follow initially some form of partial approach, as outlined beave. As experience is gained, the scope of the program is frequently widened to cover the whole country or all the children. The next step would be to replace this partial approach by the more comprehensive one described earlier.

(v) Measures for implementing the Program

151. For the implementation of a children's nutrition program, two sets of policy measures are of basic importance:

(1) Ensuring the availability of additional supplies;

(2) Consumption and distribution policies.

(1) Ensuring the additional supplies

152. An essential aspect of formulating a program for children's nutrition is to check the technical and economic feasibility of providing the additional supplies needed to meet the consumption targets. As a next step, measures should be designed to ensure that additional supplies are furnished by domestic production, imports and foreign aid.

153. The expansion of domestic production is the long-run course most likely to be adopted by developing countries. However, increasing the production, especially of commodities such as milk, or of protein rich crops such as legumes, is hampered by a number of complex problems the discussion of which is partially covered in appendices to this paper. In FAO's opinion, larger funds should be allocated by governments to agriculture, and greater attention should be paid to institutional and organizational changes, to assure adequate supporting services, timely availability of supplies of agricultural requisite and the provision of economic incentives to farmers than is done in most current development plans.

154. Shortage of foreign exchange for commercial imports of food and the disincentive effect of such imports on local producers may restrict supplies from this source. Although some developing countries do currently import dairy products, nearly all of them give considerable attention to the development of animal husbandry, but, since animal husbandry development has generally to be based on crop development, it should be kept in mind that there must be a surplus of crop production usable for animal feeding over and above the calorie requirements of the population, before the supply of animal proteins can become an economic possibility.

155. International assistance, in the form of direct supplies of the food required, is, for the recipient country, the quickest and least costly method. This is useful in times of emergency, and where nutritional deficiencies are acute and require immediate action, but direct international food aid should be considered only as a short-term measure until domestic productive capacity is built up.

(2) Consumption and distribution policies

156. In order to stimulate and direct the consumption of appropriate food for families, governments should introduce suitable policies and measures, such as education and research, feeding schemes, food distribution and price policies which are the most important.

157. At present, nutritional education is provided to parents teachers, social welfare and extension workers, and to children themselves. In the case of parents, the best results are usually obtained through organized parent groups. Teachers and social workers often receive some training in nutrition and some in-service training. The nutritional education of children is being carried out in the schools through its integration into health and other related subjects and through out-of-school youth programs offering practical learning-by-doing home economics training. But more emphasis on training in nutrition for these groups seems to be needed.

(vi) Supplementary feeding schemes for children and mothers

158. These schemes are now readily accepted as a method of compensating for the deficiencies in family diet. These schemes have a multi-purpose role where malnutrition is still a serious problem. First, directly, they improve the diet of vulnerable groups. Second, they represent important channels for nutrition education, by which food habits can be influenced and permanetly improved. Third, new foods can be promoted and popularized more easily through well organized feeding programs, which then help in creating a demand and a market for these foods.

159. On the other hand, since prices influence food consumption patterns, price policies, direct and indirect subsidies, tax measure and other means to lower prices that might enhance a greater consumption by the under privileged classes, although necessary in certain specific cases, are only partial measures that will probably generate other problems, specially inflationary pressure and will not solve the basic issue, that is, the lack of an adequate food supply, the high cost of production and marketing, and the low purchasing power of certain population groups.

160. It is well known that in Latin America marketing is one of the main obstacles for a higher rate of development in agriculture. Therefore, an integrated program must also take into account the distributional and marketing problems involved in its implementation. The inefficiency of marketing channels, the high cost of marketing margins and the structure of the whole process of commercialization are so inflexible and inadequate that it is possible to say that the discouragement of both producers and consumers is due to the low prices received by the former and the high prices paid by the latter. Proof of this can be easily obtained by examining the price indexes received by farmers and the food-component of the cost of living index. The revision of the marketing process is absolutely indispensable to provide more incentive for the producer and lower costs for the consumer.

161. An improved diet usually involves larger consumption of such commodities as meat, milk, fish and fruit and, since nearly all of them are highly perishable, the construction of suitable marketing, refrigeration, home preservation techniques and storage facilities, is needed. Another area of high priority is the improvement of transport facilities. The hinterland of developing countries is often poorly served by transport, so that the diet there remains inadequate or monotonous and liable to wide seasonable fluctuations. Under such circumstances, improvements in the diet and nutritional levels tend to be restricted to coastal or urban areas. It may be necessary, therefore, to invest in the economic infra-structure, e.g., ports, main and feeder roads, expanding transport equipment and skilled personnel, etc. While all such forms of investment are usually capital intensive, very effort should be made to use under-employed man-power, e.g., in constructing roads. It is the lack of these facilities that frequently retards agricultural development and the transition to a market oriented economy. Moreover, investment in marketing and transport facilities and other forms of economic infrastructure stimulates domestic food consumption, thus bringing about general improvement in the levels of nutrition.

V. SUMMARY AND RECOMMENDATIONS

General Situation

162. The information available is not enough to give a complete picture of the problem of food and nutrition in Latin America. General estimates can be made which point out the main food and nutrition problems that have been shown in preceding chapters.

163. The average per caput calorie intake seems to be adequate in some countries. But in most of the countries large sections of the population are obtaining less than their requirements due to the insufficiency of local production, difficulties of marketing, low purchasing power and bad food habits.

164. The quantitative problem is not only production at the national level, but also marketing.

165. The problem in relation to the quality of the diet is even more important and affects all of Latin America. Consumption of protective foods, especially those of animal origin, is very low and results in protein deficiencies which are often accompanied by vitamin and mineral deficiencies.

166. The problem of malnutrition and poverty, low productivity and land and labour are so related that it is usually difficult to distinguish between cause and effect. Bad nutrition determines low working efficiency and low output reflected in an inefficient agricultural production which results in poverty and hunger. If average income and levels of agricultural production could be raised in the necessary measure, food consumption and the levels of nutrition would after some time of adjustment increase. But it is obvious that with the growing pressure of population on agricultural resources, Latin America cannot afford to wait until the impact of industrialization has determined a substantial increase in per caput incomes. Therefore, some very direct action on the nutritional aspects is needed in order to break this vicious circle.

167. In Latin America many cases of malnutrition are determined or aggravated by educational factors. Bad food habits are largely due to ignorance of basic nutrition at practically all socio-economic levels, Besides poverty and scarcity of production, lack of knowledge of the nutritive value of foods, ignorance of weaning practices and ignorance of the possibility of production of certain protective foods are serious limiting factors in the amelioration of nutritional conditions, especially of nutritionally vulnerable groups of the population formed by mothers and children.

The situation of children and youth with respect to food and nutrition

168. Although it is true to say that the state of a man's health depends upon his diet through out his life, it is during the growing period, that is to say, during childhood and adolescence, that these two conditions are most closely related. In previous chapters it has been observed that children need relatively more proteins and nutritive food than adults do. In spite of this fact, in many cases measures have been taken to satisfy the nutritional requirements of adults whilst those of children have been relegated to second place.

169. However, since growth begins from the moment of conception and not only after the child is born, an adequate balanced diet for the pregnant and nursing mother plays an important part in the nutritional state of the child. That is to say that during pregnancy as well as during the nursing period supplementary nutritional requirements are created to ensure the healthy development of the child which must be given careful consideration when drawing up plans of nutritional and dietary improvements for children.

170. In Latin America, children under 15 years of age contribute 42 percent of the region's entire population. Problems created by under and malnutrition in proteins, vitamins and minerals often accompanied by serious caloric deficiencies, mean that the situation of Latin America's children is critical and in urgent need of attention. Thus, special consideration should be given to the establishment of measures to improve these aspects of the situation, which will ultimately safeguard and keep at its best productive condition the human capital of Latin American countries.

171. Moreover, Latin America's disorderly social movement, particularly as regards to unplanned and violent urbanization and industrialization, gives the family neither social nor economic stability, provoking a state of economic insecurity and social distress which favours the desintegration of the family as a single unit. This in turn gives base to a serious problem, i.e. the neglect of children and young people with its inevitable future problem. This neglect often finds outlets in disturbed patterns of behaviour such as lack of social adaptability, juvenile delinquency, and illness and undernutrition especially amongst nursing and pre-school age children.

172. Lack of nutrients is therefore not the only fundamental cause for child's under-nutrition in Latin America; so is the lack of a family to supervise the child's feeding and attend to his other needs. There is no question that the social, cultural and educational aspects of the situation also have a pronounced influence on child's malnutrition.

Suggested action for the future.

173. Emphasis must be placed once more on the fact that children's nutrition cannot be separated from the general problem of improving nutritional levels of the total population. Accordingly, the organization concerned with planning for the nutritional needs of children should form a part of the more comprehensive organization required to plan the nutrition of the entire population. If comprehensive general nutritional services and organizations exist, the requirements of children will undoubtedly receive adequate attention.

174. In nutritional planning, policy-makers and planners need readily available scientific information and advice. Each country should have, therefore, nutrition and food institutes. Within such an institute, special studies and research into children's nutrition should be organized. Moreover, as the successful implementation of a plan requires a number of applied nutrition workers, provision should also be made for training them. Since child welfare workers are concerned with all aspects of children's welfare, an essential part of their training should consist in thorough instruction in the nutritional problems and requirements of children.

175. At the governmental level, there should be a food and nutrition committee dealing with nutrition in relation not only to health but also to food consumption, production and distribution. Such a committee should include officers specifically concerned with policies and measures to meet the nutritional requirements of children.

176. In order to ensure adequate formulation of nutritional plans and programs the inclusion of nutritionists in the national planning agency for economic and social development is essential. Similarly, in the planning advisory and evaluation bodies, nutritionists should be represented. Through such means, development planning would be closely linked to nutrition, and an integrated plan, based on cooperation between economists, nutritionists, agronomists and other experts, would be formulated.

Remedial programs

177. A great number of programs are being carried out in Latin America to improve the present dietary and nutritional situation of children and young people. Many programs are aimed at improving food production and consumption; others are supplementary food programs; others are programs of nutrition education and the development of protein-rich foodstuffs.

178. To illustrate this it can be said that the applied nutrition programs described in detail in Chapter III, are 19 in number and operate in 15 countries, advised and assisted by 22 international agency experts FAO, WHO and UNICEF are taking part in their implementation together with the governments of the region. Likewise, extensive distribution programs are being carried out for vegetable mixtures of a high biological value and low cost (INCAPARINA, PERUVITA, FORTIFEX) in Central American countries, Peru and Brazil. Mexico, Ecuador and other countries are presently studying new formulae for mixtures of high biological value.

179. Different programs are being carried out by the departments of agriculture, health and education to achieve improved food production and consumption and dietary and nutritional education. Manuals and pamphlets have been published and a number of nutrition training courses for teachers, public health staff, agricultural extensionists, social workers, home economists and community leaders are being held in an attempt to coordinate the efforts being made to achieve an improvement in the present dietary and nutritional conditions of our countries.

180. These programs have been especially directed towards pre-school age children, nursing children and young people, as well as pregnant and nursing mothers. It is indispensable to have the full support and backing of all governments in providing personnel and funds which will permit these efforts to be continued and intesified so that they may reach the remotests corner of every country.

Planning for the nutritional needs of children

A. The current situation

181 Due to FAO's emphasis through Conferences, technical assistance experts and funds for special programs, upon the role of nutrition within agricultural and socio-economic development planning, the governments of the region are becoming more and more interested in including nutritional aspects in development plans, as are described in Chapter II.

182. But it is necessary to remark that great efforts should be made in all Latin American countries to have a complete and real picture of the present situation, prior to any kind of planning. That is to say that a good diagnosis gives us the clues as to the main problems that have to be solved through planning. In this way the planning will externalize all the needs of the society.

183. At present, nearly all the surveys carried out in the region leave much to be desired, both from programatic and methodological points of view. Nevertheless, several countries are at present planning to carry out food consumption and clinic-nutrition surveys. It is hopped that

these studies reach a faithful picture of the reality, following a systematic line.

184. A part from the lack of sufficient basic information appointed above for initiating or implementing specific programs for nutritional improvement within the government's overall plans, other obstacles have been met in the region, the reason of which could be outlined as follows:

(i) Lack of suitable trained nutrition personnel to lead and guide these efforts;

(ii) Lack of adequate statistical data which would give a clear idea of the degree of nutritional deficiencies affecting the different population groups;

(iii) Lack of sufficient nutrition centers in the region to undertake applied research upon which practical programs could be based, aimed to improve the population's diet;

(iv) Lack of coordinated action to advise governments and planning authorities on the formation of policies which affect the population's nutrition; and

(v) Lack of a national food policy to direct food availability towards the satisfaction of nutritional necessities, within the framework of national development plans.

B. Measures recommended to the countries in the region

Scientific information.

185. Each country in the region needs nutrition institutes to advise policy-makers on the physiological bases of nutrition and the population's nutritional requirements, with special reference to children, and on other measures needed to improve the nutritional condition of the population. These institutions should keep in close contact with centres for the training of professional personnel in nutrition and related activities, as well as with technicians such as teachers, home economists, agricultural extensionists, public health personnel, economists and planners.

. Coordination

186. Bearing in mind that planning for the needs of children and young people cannot be separated from those of the population in general, all the agencies working in this field should join forces when considering plans which have to do with the nutrition of children and the family as a whole.

Participation in Planning.

187. Nutritionists should be included among the staff of national planning departments to plan, implement and evaluate programs dealing with diet and nutrition.

Planning data.

188. Due to the need for accurate data on which basing the formulation of plans, it is obsolutely indispensable to obtain sufficient information either by means of new research or the gathering together of existing data which are often scattered about amongst the different sections. These would be :

(i) surveys of representative samples of the population, of food expenditure, consumption and clinic-nutrition, properly stratified by family composition, geographical location, income levels, ethnic groups, food habits and others. In particular surveys among specific groups of the population that should be coordinated with nation-wide house-hold food consumption surveys already referred to above;

(ii) food balance sheets in those countries which do not have them at present, and improvements in accuracy of such statistical data as changes in stocks;

(iii) data concerning food marketing including canned foods;

(iv) demographic and economic statistics and epidemiological indices.

Long-term Planning

189. Long-term, comprehensive programs for improving children's nutrition could be designed along the lines described in the first section of Chapter IV in this paper. The essence of the suggested approach is to calculate the least-cost combination of the additional nutrients necessary to bring the level of children's nutrition to the ideal standard. As a rule, this cost is likely to be so high that the final goal can be achieved only in the long-run by means of a perspective plan. Such a long-run cost, however, can be split into medium-term costs which could be financed within a medium-term, say 5-year plan. In this way a gradual approach to the ideal nutritional standards can be ensured.

Immediate Planning Action

190. Limited or pilot projects, say for children in a particular district, based on small-scale surveys and available records kept by hospitals and clinics, may be developed. Meanwhile, efforts should be made to

collect more comprehensive data necessary for the more comprehensive planning methods required.

Program Implementation

191. When a comprehensive program for children's nutrition is formulated, its implementation will consist of the following:

(i) Supplies will have to be ensured through -

(a) stimulation of domestic production,

(b) international trade, and

(c) international assistance (only as a short-term measure)

Given adequate priorities in national plans, and adequate vigour in their implementation, both domestic production and consumption of many protective foods (e.g. fish, eggs, poultry, swine and other small animals) can be considerably increased as well as those of other no less important products such as grain legumes. Supplemental imports of milk and fresh products will continue to be important particularly in national emergencies or for any other specific reason, such as supplementary feeding.

(ii) Consumption and distribution policies are needed, including

(a) Nutrition training, education and research to change food habits,

(b) special supplementary feeding schemes for children and mothers,

(c) market price policies and taxes to influence consumption patterns, and

(d) rationing is a possibility to influence consumption in special groups, but is difficult to control.

(iii) Distribution and marketing facilities will need to be developed as it is the lack of them that often impedes production.

A P P E N D I C E S

on

Current Availability and Possible Expansion of Supplies of Selected Protective and Related Foods in Latin America

Appendix I - Notes on Current Availability and Possible Expansion of Supplies of Eggs in the Latin American Region.

Appendix II - Notes on Current Availability and Possible Expansion of Supplies of Meat in the Latin American Region.

Appendix III - Notes on Current Availability and Possible Expansion of Supplies of Milk and Milk Products in the Latin American Region.

Appendix IV - Notes on Current Availability and Possible Expansion of Supplies of Fish and Fish Products in the Latin American Region.

Appendix V - Notes on Current Availability and Possible Expansion of Supplies of Grain Legumes in the Latin American Region.

Introductory Note

The following appendices summarize the present situation and possible improvements in availability and consumption of the major protein sources for the people of Latin America. They provide, in addition, considerations of current obstacles to a more rapid expansion of this kind of protein food supply and of the measures that must be taken to overcome such circumstances.

Inadequacies of data and the differing nature of the problems have led to some differences in presentation. However, these appendices provide important additional and substantiating information and reveal the gaps to be considered in further approaches to introduce food production into the national and regional planning. The nutrition needs of the population, especially of those named "vulnerable nutrition groups", children and mothers, are taken into account.

Notes on Current Availability and Possible Expansion of Supplies of Eggs in the Latin American Region.

(a) Current Availability

(i) Egg consumption levels in Latin America

In Latin America as a whole, average per caput consumption is estimated to be around 85 eggs per year. In contrast to meat, production of eggs has expanded at a higher rate than the population, raising per caput consumption by more than 20 percent above the 1948-52 level. However, consumption has remained far below the levels prevailing in the developed regions, which are more than 300 eggs in North America and nearly 200 eggs in Western Europe.

Countrywise, consumption is highest in Argentina and Uruguay with 120-130 eggs per caput per year. Estimates for Mexico indicate around 90 eggs per caput and ground 70 eggs for Brazil and Venezuela. Consumption is lowest in Peru and Paraguay with around 15-20 eggs per caput per year.

(ii) Trends in production

As it was stated above, improvements in poultry and egg production have recently been reached in many Latin American developing countries. However, it must be noted that for most countries in the region, statistics on poultry numbers and egg production are either incomplete or non-existing, and that therefore, the above data are largely estimates. Deep litter and cage operations have been used successfully because of their simple central and management, especially in Argentina, Brazil, Mexico and Uruguay.

(iii) International Trade

The only major exporter of eggs in the region is Argentina with European countries as the main buyers, but in recent years this trade has been severely reduced. Venezuela and some countries in the Caribbean are importers, with the United States and Canada the main suppliers, but these imports have also been shrinking, largely because of an increase in domestic production. Intra-regional trade is insignificant.

(iv) Programs of international assistance

Applied Nutrition Projects, jointly sponsored by FAO/OMS and UNICEF in which protective foods production activities are the main objectives, have specific projects concerning poultry and egg produc-

tion. This action has been implemented in the region through the work done by a poultry officer who works on a regional basis in Latin America.

(b) Possibilities for Expanding Current Availability

(i) Possibilities for expanding production

Poultry production can be expanded much quicker than the production of other livestock, particularly with the help of large-scale production methods developed first in the United States and introduced later in many countries around the world. It appears that in a number of Latin American countries, successful starts towards specialized poultry and egg production have been made. However, even though a rapid expansion of poultry production has been reached, a high level of poultry (meat and egg) production can be substained only if there is a well-organized marketing system, good supplies of balanced feed mashes and a properly organized veterinary service to prevent and control poultry diseases.

(ii) Possibilities for increasing international trade

No future trade development in eggs and egg products in Latin America can be seen because of a relatively favourable development in production in each Latin American country.

(iii) Possibilities for expanding international assistance.

Larger supplies should come principally from expanded domestic production, and international assistance should aim at helping the countries to modernize their production and distribution methods.

In emergency or famine situations, dried eggs are one of the most suitable means to improve the intake of animal proteins. Developed countries, where the potential for egg production is great, may in such cases contribute to food aid programs, provided this be considered desirable from the point of view of national and international policies.

In most of the Latin American countries the poultry and egg local production and consumption level are progressing satisfactorily within the framework of the Applied Nutrition Programs, in which more attention will be paid to poultry projects (in Brazil, Chile, Colombia, Ecuador, Paraguay and Peru) with special emphasis on egg production and consumption. However, it would be advisable to increase poultry projects within the food production and consumption activities of the Applied Nutrition programs.

Notes on Current Availability and Possible Expansion of Supplies of Meat in the Latin American Region.

(a) Current Availability

(i) Meat consumption levels in Latin America.

Among the developing regions, Latin America has the highest average per caput consumption of meat, estimated at about 35 kilograms (all meats including offals). Beef accounts for around 70 percent of total meat consumption. It appears that the share of pig meat has increased in the postwar period and that consumption of poultry meat has been increasing also.

In Argentina and Uruguay, where natural conditions for cattle raising are very favourable, around 100 kilograms of meat are consumed per caput and per year, which is far above the consumption levels in other countries of the region, as demonstrated by the following data :

Paraguay	44	kilograms
Chile	35	"
Colombia	32	"
Brazil	27	"
Mexico	24	"
Perú	18	"
Ecuador	14	"
Honduras	13	"
Haiti	6	"

Considering the region as a whole, present average per caput consumption is estimated to be nearly ten percent less than at the beginning of the fifties because production has not kept pace with the fast growth of population. Over the above period, per caput consumption has declined in Argentina, Brazil and Uruguay, and very likely also in Chile and Colombia. The imbalance between demand and supply has been reflected in frequent meat shortages in many markets of the region. Mexico and Venezuela are among the few countries where consumption has improved.

(ii) Trends in production

Latin America is rich in livestock and the ratio between human population and livestock numbers - in terms of livestock units, excluding poultry - is 1,05 compared with 0,54 in North America and 0.33 in Europe. Only in Oceania the ratio is higher, namely 2.53. However, production is generally an extensive basis and has increased rather slowly. In

the first years of the sixties, the region's total production of meat is estimated to have been about 20 percent larger than during 1948-52, whereas at the same time population has increased by more than 30 percent.

It is estimated that production has grown in almost all contries in the region, with Mexico and Venezuela recording the highest rates of increase; in both countries total meat production in recent years was about 70-75 percent above 1948-52.

(iii) International trade

In view of the large exportable supplies in the River Plate countries, Latin America is one of the main suppliers of meat to world markets, largely to Europe and the United States. The Caribbean area, on the other hand, imports relatively large quantities of Meat from the United States, Europe and also Oceania. The main importers in this area are Cuba, Jamaica, the Mother-lands Antilles, and Trinidad and Tobago. During 1961-63, Latin America's net exports were about 570,000 tons of fresh, chilled and frozen meat, 70,000 tons of canned and prepared meat, and 500,000 head of cattle. (See FAO Trade Yearbook).

Compared with trade with other regions, intra-regional trade is small.

(iv) Programs of international assistance.

International assistance has been concentrated mainly on helping in the development of domestic resources and intensification of livestock production. Technical assistance has been provided in most of the countries, to raise the standards of animal husbandry and feeding, mainly by improving the pastures, to eradicate animal diseases, and to introduce efficient marketing methods. In certain areas, credits were granted by the International Bank for Reconstruction and Development to facilitate the execution of government programs for improved livestock production, as in the case of Uruguay in 1960. (Bilateral assistance, particularly on the part of the United States, also has been of considerable importance.)

(b) Possibilities for Expanding Availabilities

(i) Possibilities for expanding production

In view of the wealth in livestock, there are good possibilities in most countries of the region to expand production at higher rates than in the past. (See Dairy section).

The solution must be sought in intensifying livestock production. In Latin America as a whole, output of beef per head of the existing cattle herd is 28 kilograms per year, compared with 63 kilograms in Europe and 72 kilograms in North America. These figures indicate that there is ample room for improvement, but future growth will depend on many factors among which higher consumer incomes, efficient marketing systems, including good transport facilities, and far-sighted government policies are of great importance. Well organized extension services, moderate taxation and cheap credits are some of the ways in which governments can speed up the process of intensification and modernization of their livestock industries.

(ii) Possibilities of increasing international trade

The River Plate countries are significant exporters of meat (mainly beef), but the bulk of these exports are directed to the high-income countries of the Northern Hemisphere. Also exports from Mexico, Costa Rica and Honduras to the United States have been increasing.

On the other hand, intra-regional trade is small because most of the countries where consumption levels are low, are economically not in a position to step up imports which would improve meat consumption levels. As the latter group of countries will endeavour to meet the growing requirements by larger domestic production, it is unlikely that there will be any major expansion in intra-regional trade.

(iii) Possibilities for expanding international assistance

International assistance can have a very significant part in the development of Latin America's livestock production. Action should concentrate on helping the various countries to make the best possible use of their own resources which in the case of livestock are considerable. FAO will continue to have major role in the assistance activities which cover a very broad field, from pasture management and animal husbandry to economics of livestock production, marketing problems and the establishment of solid livestock statistics. In this respect, the various develop-

mental programs in animal production already initiated with FAO, Special Fund and IBRD assistance in the temperate areas of the region are immensly encouraging, while the experimental work undertaken on tropical pasture development and utilization provides real promise of great increases in animal productivity. The immediate task is to develop and expand these successful development techniques by the use of demonstration and trainning programs, by financing well-planned farm improvement projects and by strengthening university faculties so that the professional competence of graduates and the technical servicing of improvement plans may be augmented. The development of intensive forms of animal production such as poultry, pig and efficient dairying has an essential role in any well-planned livestock programs. As with the more intensive animal industries increases in these fields of production are sought by providing technical assistance to member governments, by organizing FAO/SF projects, by providing projects guidance to the World Food Programs and the Freedom from Hunger Campaign and by securing loan money for livestock development from the IBRD.

Improved animal health is indispensable to any improvement in animal production not only to reduce economic losses and interference with breeding schemes, but also to protect human health and allow the marketing of exportable surpluses at favourable prices. The division has therefore, developed a strong animal health programme.

Notes on Current Availability and Possible Expansion of Supplies of Milk and Milk Products in the Latin American Region.

(a) Current Availability

(i) Milk consumption level in Latin America

The consumption of milk and milk products in Latin America is rather low in comparison with the advanced dairying regions, as the following date show : 1/

	Annual per caput consumption of dairy products in terms of milk equivalent, cow and buffalo milk (average 1955-59)
	..... kg .....
Latin America (excluding Argentina)	82
Argentina	183
Western Europe	337
Eastern Europe (excluding USSR)	261
USSR	266
North America	321
Oceania	487

Milk consumption in Latin America is, however, higher than in the Far East (41 kg. per caput, excluding Japan) and in Africa (45 kg. per caput excluding South Africa).

There were enormous differences among countries in the level of milk consumption depending on production and levels of national income. Table 1 (Appendix) shows milk consumption per caput in a number of countries in 1959-61. This table shows that the countries with the highest milk consumption were Uruguay (248.3 kg. per caput per annum), Argentina (183.1 kg.), Chile (140.1 kg.) and Colombia (110.3 kg.) in South America; Nicaragua (194.0 kg.), Costa Rica (144.4 kg.) and Cuba (116.2 kg.) in Central America. Milk consumption in these countries was at a similar level as in some developed dairy countries in Europe, but consumption was extremely low in Bolivia (30 kg.), Guatemala (38.2 kg.), Jamaica (43.5 kg.) and even in Brazil (69.6 kg.).

Indications of trends in milk consumption may be seen in Table 1 which shows the percentage changes in milk production between 1950/52 and 1960/62. Domestic production is the main source of supply.

1/ Means of Adjustment of Dairy Supply and Demand; FAO Commodity Bulletin Series, No.37, Rome 1963. p. 81

The increasing trend in per caput production and consumption was most pronounced in Puerto Rico, Cuba, Mexico and Panama in Central America and in Ecuador, Surinam, Uruguay and Brazil in South America. This was also reflected in milk consumption, as imports did not increase enough to offset the fall in production. In most of the countries incomes are too low to increase consumption through imports. The income levels range from U.S.$ 200 - 300 per caput in most of the countries. The exception was Venezuela, where imports of milk powder and condensed milk were nearly three times larges than the domestic supply of fresh liquid milk due to the development of the oil industry. The domestic milk powder industry has developed in Venezuela, which has the highest income level in Latin America (around U.S.$ 800 per caput per annum).

(ii) Trends in production

Between 1950/52 and 1960/62 the milk production in Latin America increased by 53 percent, but milk supplies per caput increased by only 16 percent (see Table 1). The upward trend in milk production was more marked in Central America than in South America.

There are a number of reasons for the inadequacy of production. 1/ One of the main factors is the low yields per cow due to inadequate fodder supply and poor breeds. Some countries - such as El Salvador, Jamaica, Surinam, British Guiana and Peru - have animals with milk yields of between 500 and 900 kg. per annum. Milk production, however, has not increased adequately either in the countries with relatively high-yielding animals, such as Argentina, Chile (average about 2.500 kg.) and Guatemala (1.000 kg.), due to unsuitable pricing and marketing systems, lack of transportation between low-cost remote producing areas and consuming centres, and various other reasons.

(iii) Trends in international trade

Production has not been able to meet the demand for milk products in rapidly growing cities, particularly in countries where the production trends were almost at a standstill. These countries have consequently imported large quantities of condensed and evaporated milk and milk powder.

1/ See General Review of Economic Aspects of Dairy Development in Latin America, by Mirko Lamer, FAO Regional Meeting on Dairy Problems in Latin America, Sao Paulo, Brazil, 11-20 April, 1961 (CCP Working Paper No. 61/1).

Latin America shared about 13 percent of the world imports of condensed and evaporated milk and 23 percent of milk powder (whole and skim) in 1962/63, as the following Table shows:

Imports of preserved milk products in Latin America 1/

	1958/59	1962/63
	thousand metric tons	
Condensed and evaporated milk	69.0	56.0
Milk powder (whole and skim)	122.0	140.0
	percentage	
Share of world total:		
Imports of:		
Condensed and evaporated milk	17	13
Milk powder (whole and skim)	27	23

Total imports of condensed and evaporated milk showed a downward tendency because some of these countries, particularly in Central America, developed their own industry, but an upward trend is noticeable in South America (see Table 2). Imports of milk powder are continually rising - they were 22,000 tons in 1948/52 and reached over 150,000 tons in 1963. This happened in spite of import restrictions and the growth of domestic dry milk industries in some countries. But the domestic milk supply cannot meet domestic demand. Imports of butter and cheese are small, but they also increased in the postwar period. Exports of milk products consist mainly of butter and caseis shipments from Argentina.

Policies for dairy products impose high ad valorem duties, specific tariffs, quota controls, import licenses, unfavourable foreign exchange for imports, etc. These measures are not only a consequence of unfavourable balance of payments, but also have the aim of protecting the established domestic dairy industries. In several countries, imports of certain milk products were almost excluded. However, they were not able to check the upward trend of imports of milk products in general due to insufficient domestic supply.

In Latin America, the population increased 31 percent and milk production 53 percent between 1952 and 1962, while during approximately the same period (1948/52 to 1963) imports of whole and skim milk powder increased by 560 percent, butter 140 percent and cheese 122 percent Imports of condensed and evaporated milk rose by 89 percent in South

1/ Source: FAO trade Yearbook.

America while in Central America they increased only slightly, bu 2 percent Exports of butter increased much less (30 percent) than imports, while exports of cheese even declined (17 percent) (see Table 2).

(iv) Programme of international assistance

Milk products on concessional terms have been supplied by the United States Government. The following Table shows concessional and commercial shipments of skim milk powder from the United States to Latin America (excluding Argentina):

Year	Government programmes	Commercial shipments	TOTAL	% of Government shipments to total shipments
		(thousand tons)		(percentage)
1960	18.4	9.8	28.2	65
1961	55.0	11.7	66.7	82
1962	78.4	14.9	93.3	84
1963	121.8	16.7	142.0	86
1964	104.5	20.2	124.7	84

Source: Foreign Agricultural Circular. FAS:USDA, Nos. FD 7-63 (September 1963), FD 6-64 (July 1964) and FD 6-65 (June 1965)

Years 1960 and 1961: Commercial shipments included products moved into export under weekly sales programmes LD 33 and LD 35 and under PIK Programme.

Years 1962 onwards: Commercial shipments, in addition to dollar sales, include exports under Title I (sales for foreign currencies), barter agreements; Title IV (long-term credit); government-to-government sales mainly for school lunch programmes; and products sold for exports under special sales programmes.

Government shipments of skim milk powder increased very much between 1960 and 1963, while commercial sales remained practically unchanged. There was a decline in Government shipments in 1964 and 1965 due to lower support purchases following an improvement in commercial demand.

In some Latin American countries, United States surplus products were not allowed to enter (Uruguay) or only in small quantities (Argentina, Venezuela) as it was feared that surplus products would compete with the domestic industry on commercial markets. But Brazil, like some other countries, has been a large recipient of United States surplus skim milk powder and has been able to establish 15 milk plants in the last decade due to the enormous demand for this product. 1/

1/ Characteristics and Problems of Foreign Trade of Dairy Products in Latin America. CCP Working Paper No. 61/2, Rome, 1961

International assistance is also given, through both multilateral and bilateral programmes, for the development of domestic dairy industries. A prominent role in dairy development is played by foreign firms, particularly Nestlé. UNICEF assisted in the establishment of milk plants with allocations totaling U.S.$ 3.5 million spread over 12 countries. Through UNICEF's assistance 11 dry milk plants and 2 pasteurized milk plants have been established in Latin America. Since 1962, a FAO Dairy Training Centre has been functioning in Chile with the assistance of experts from Denmark. The Government of the Netherlands has also assisted in the development of a milk scheme in Surinam.

(b) Possibilities for Expanding Current Availabilities of Milk Products

(i) Possibility for expanding production

The continuing extension of cultivable land, the low per caput consumption of milk and milk products and the rapid growth of population would potentially favour the expansion of animal production and, consequently, of the dairy industry in most countries of Latin America.

Considerable international and national technical assistance has been provided to the dairy industry of the region but without having a major impact to date and some duplication and contradictions between agencies do exist. However, even with the elimination of these difficulties, it is unlikely that adequate rates of development can be achieved for some years without careful consideration of such other factors as:

(1) the demographic explosion in the region

(2) the slow development of agricultural productivity generally,

(3) The shortage of adequate human food and animal feeds,

(4) the drastic shortage of capital and high interest rates, and

(5) the lack of adequate processing and distribution facilities which prevents adequate utilization of already existing supplies.

It is unlikely that private capital will be attracted to fill the gap in processing and distribution facilities under the circumstances indicated above, particularly for the large part of the

vulnerable groups with low purchasing power. Therefore, special measures will undoubtedly have to be taken by governments and international agencies if the needs of children and youth are to be adequately met in the foreseable future.

A significant impact on the low rate of increased production can only be made if the measures taken in the near future include the following:

(1) A much higher priority for the development of the dairy industry within the development plans of the countries of the region. The present low priority is indicated by the fact that only three dairy experts are currently supplied. under the EPTA programmes in all of Latin America.

(2) The existing and proposed internationally assisted projects for the development of cattle production provide unusual opportunities for including an effective attack on the problems of processing and distributing of milk products. In fact, the eventual viability of production projects may depend on doing so.

(3) Some of the existing milk processing plants require rehabilitation and perhaps limited further diversification to enable them to operate in a more economic and efficient form.

(4) Many new plants are needed in present milk producing areas for processing and preserving supplies for domestic consumption. FAO is anxious to assist the countries and other international agencies concerned in a coordinated approach to these recommendations. At present, under instructions from its Committee on Commodity Problems, FAO is preparing an evaluation of a few milk conservation projects from which further clarification of some of the above matters is to be expected.

However, the above recommendations can only be followed if, first, the following difficulties are resolved:

(1) It is necessary to increase the milk production per cow through rational feeding programmes, extended milk recording to enable a selection of animals for reproduction, prevention of cattle diseases, etc. Most countries have few, but well-trained profes - sionals in these various aspects who are, at present assisting the farmers. However, in most cases, proper work organization is lacking. Well organized assistance on a zonal basis could provide a much greater impact. O ly such districts with natural conditions for milk production should be considered.

(2) Low milk quality is mainly due to the relative ignorance of the milkers, and only through an organized extension work would it be possible to obtain satisfactory improvements in this aspect. Priority should be given to those zones delivering milk to plants already established.

(3) The lack of milk supply to the established milk plants has been due to the following reasons:

a) The expected increase of the milk production in the respective zones has not occurred although the conditions of soil and climate favours this production. The reason for this may be the lack of an organized assistance work for the farmers, as mentioned under no.1, or that the milk production in the respective zones is uneconomical compared with other more remunerative farm products. In both cases the problem can normally be solved by assisting the farmers to introduce more rational and economical working methods.

b) Or, the plant is located in a district where little or no possibilities for expansion of the milk production exist, In this case, the only solution would be to expand the zone, delivering milk to the plants if possible. It should be born in mind that any new milk product should be subject to previous studies and survey of the zone in order to insure sufficient future milk supply.

(4) The mechanization and automatization of the milk industry has normally not resulted in a more economical production and reduction of man-power as expected. This is due to the lack of skilled workers and specialized dairy technicians. In many cases, the people in charge of the technical administration of the plants have no previous knowledge of dairying at all.

(5) The reasons already mentioned and others related to the low incomes, are aggravated by a vicious circle established by bad nutritional habits of the population viz-a-viz scarce and inadequate milk distribution channels. Lately soft drinks, due to their perfect commercialization, are taking an important place in the consumption habits of the population. It may be said that milk, as well as other beverages such as fruit juices, is being replaced in Latin America, by the ever increasing consumption of soft drinks.

(ii) Possibilities for increasing international trade.

There are good prospects for exports of milk products to Latin America since domestic production is not increasing at the same rate as the demand for these products. This will be much more evident if the economic growth and urbanization of Latin American countries continues. Latin American governments may thus be led to re-examine their present trade policies, especially if domestic production does not increase at a faster rate.

(iii) Possibilities for new or expanded international assistance.

Except for that provided by the United States, very little assistance in dairy supplies is provided under bilateral arrangements and multilateral arragements have not developed to the same extent as in the Far East. International Development Bank, International Bank for Reconstruction and Development, Alianza para el Progreso, United Nations Special Fund, United Nations Children's Fund, and various bilateral arrangements have provided considerable technical assistance. However, there has been inadequate coordination of such efforts with resulting duplication and, unfortunately, mutual criticism. UNICEF assistance has been limited mostly to the dried milk field and its allocations to Latin America have been

small in comparison with those to other regions. 1/ There is wide scope for the development of the dairy industry and for increased milk consumption, but there is need for some agency to coordinate the various resources of aid, and to act as a catalyst around which the external and internal resources could be focused on the problems of both production and consumption.

FAO could help through the providing of experts to the countries for the organization of extended programmes for the improvement of dairy farm management and the required extension work on hygienic milk production could be carried out by the Peace Corps volunteers or associated experts under the leadership of the above experts.

As far as the education and training programmes are concerned, FAO established Regional Dairy Training Courses for Latin America in Chile, 2 years ago. These courses so far have had a participation of 98 students from 17 countries, partly government employees in charge of National Dairy Development programmes and partly technicians from private enterprises.

From the experience gained from these courses, it can be deduced that there exists a general lack of knowledge of dairy technology in Latin American countries, and even among professionals such as Agronomists and Vererinarians. But, on the other hand, it would be easy to prepare a staff of excellent dairy technicians in view of the general interest and enthusiasm shown by the participants of the above mentioned courses.

For this purpose it is recommended that there be a follow-up of these Training Courses through the establishment of a sufficient number of Dairy Training Centres in the region for high and medium level training on an international basis. This could be organized by FAO as Special Fund or bilateral projects. People graduated from these Centres should be in charge of National Dairy Development programmes, technical management of the Dairy Industry and preparation and training of dairy labour, in their respective countries.

1/ UNICEF allocations amounted to U.S.$ 22.8 million between 1951 and 1964, of which Latin America received U.S.$ 3.5 million - or 15.4 percent of the total.

Table I. Latin America: Changes in Population and Milk Production, and the Levels of Milk Consumption and National Income Per caput

	POPULATION (mid-year estimates)			MILK PRODUCTION			PER CAPUT MILK PRODUCTION			Per Caput Consumption of milk and Dairy Products Milk Equivalent	Per Caput National Income at 1960 Prices	
	1952	1962	% increase	1950/52	1960/62	% increase	1950/52	1960/62	% increase	1959/61	1950	1960
	thousand		%	000 m. tons		%	kg. per yr.		%	kg.per year	US$ per year	
CENTRAL AMERICA 1/	53841	71157	32	3250	6135	89	60	86	43			
Costa Rica	853	1275	49	118	*120	2	138	94	-32	144.4	306	342
Cuba	5755	7060	23	473	*1000	111	82	141	78	116.2	...	...
Dominican Rep.	2274	3220	42	57	68	19	25	21	-16	53.1	2/ 169	3/ 219
El Salvador	1955	2570	31	124	200	61	64	78	22	56.3	236	3/ 271
Guatemala	2981	4017	35	190	220	16	64	55	-13	38.2	144	156
Honduras	1452	1950	34	105	125	19	72	64	-11	62.8	153	4/ 176
Jamaica	1457	1641	13	35	33	-6	24	20	-17	43.5	194	354
Mexico	27415	37233	36	1632	3500	114	60	94	57	80.4	238	375
Nicaragua	1128	1578	40	174	*175	1	154	111	-28	194.0	...	...
Panama	874	1139	31	33	60	82	38	53	39	68.2	5/ 279	3/ 341
Puerto Rico	2227	2458	10	154	340	121	69	138	100	...	439	626

1/ Including also countries not listed in the table.
2/ 1951
3/ 1959
4/ 1958
5/ 1952
6/ 1955

.../...

Cont....

	POPULATION (Mid-year estimates)			MILK PRODUCTION			PER CAPUT MILK PRODUCTION			Per Caput Consumption of milk and Dairy Products Milk Equivalent	Per Caput National Income at 1960 Prices	
	1952	1962	% increase	1950/51	1960/62	% increase	1950/52	1960/62	% increase	1959/61	1950	1960
	thousand		%	000 m. tons		%	kg. per yr.		%	Kg. per year	US$ per year	
SOUTH AMERICA 1/	116599	152760	31	11250	16065	43	96	105	9			
Argentina	17937	21413	19	4310	4483	4	240	209	-13	183.1	424	365
Bolivia	3095	3549	15	249	*250	-	80	70	-12	29.9	111	6/ 105
Brazil	55095	75271	37	2809	5460	94	51	73	43	69.6	141	3/ 136
British Guiana	447	598	34	10	17	70	22	28	27	...	5/ 215	4/ 223
Chile	6295	8001	27	695	762	10	110	95	-14	140.1	427	501
Colombia	11847	14709	25	1756	*2200	25	148	149	1	110.3	179	238
Ecuador	3350	4596	37	173	685	296	52	149	187	80.0	133	167
Paraguay	1462	1857	27	126	133	6	86	72	-16	72.2	101	102
Peru	8864	11511	30	248	421	70	28	37	32	43.5	112	3/ 126
Surinam	221	307	39	3	8	167	14	26	86	...	...	...
Uruguay	2487	2914	17	449	751	67	180	258	43	248.3	...	...
Venezuela	5472	7398	35	356	497	40	65	67	3	87.5	615	805
TOTAL LATIN AMERICA:	170440	223917	31	14500	22200	53	85	99	16			

1/ Including also countries not listed in the table.
2/ 1951
3/ 1959
4/ 1958
5/ 1952

SOURCES: Population: UN Demographic Yearbook
Milk Production: FAO Production Yearbook and other FAO Information.
Consumption: Food Balance Sheets for 24 countries of Western Hemisphere 1959-61 ERS Foreign 86, Foreign Regional Analysis Div., USDA.
Per Caput Income: FAO computations based on data published in the UN Yearbook of National Account Statistics.

Table 2.- Latin America: International Trade of Milk Products

	IMPORTS				EXPORTS			
	1948/52	1958	1963	Variation 1948/52-1963	1948/52	1958	1963	Variation 1948/52-1963
	thousand m. tons			per cent	thousand m. tons			per cent
CONDENSED and EVAPORATED MILK:								
Central America	36.0	30.0	*37.0	2.8	0.4	0.1	*0.2	-50.0
South America	9.0	15.0	*17.0	88.9	-	1.0	*1.2	...
Latin America:	45.0	45.0	*54.0	20.0	0.4	1.1	*1.4	250.0
WHOLE and SKIM MILK POWDER 1/:								
Central America	17.0	27.0	56.2	230.6	-	-	-	...
South America	5.0	69.0	89.1	1682.0	-	0.5	0.2	...
Latin America:	22.0	96.0	145.3	550.5	-	0.5	0.2	...
BUTTER:								
Central America	4.5	6.6	8.9	97.5	5.7	-	-	...
South America	5.0	7.0	14.0	180.0	6.0	9.6	15.2	153.3
Latin America:	9.5	13.6	22.9	141.1	11.7	9.6	15.2	29.9
CHEESE:								
Central America	4.3	7.6	8.1	83.4	0.3	0.4	0.5	66.7
South America	4.0	22.0	10.3	157.5	6.8	3.0	5.4	-20.6
Latin America:	8.3	29.6	18.4	121.7	7.1	3.4	5.9	-16.9

SOURCE: FAO Trade Yearbook, 1962, 1963, and 1964.

1/ Not all the milk powder imported from the United States under Government programs is recorded.

* Partly estimated.

Notes on Current Availability and Possible Expansion of Supplies of Fish and Fish Products in the Latin American Region.

(a) Current Availability

(i) Trends in production

From 1950 to 1964, world marine aquatic animals production has increased by 147% and that at a considerably accelerated rate, with an average annual increase of 2.2. million tons compared with an average annual increment of only 0.8 million during the decade 1930-1940.

In relation to the various types of livestock production, it is interesting to note that only in the years 1956-1960, average marine aquatic animal production exceeded beef and veal production by more than 6 million metric tons and pork production by 8.2 million tons.

In 1962, the world fisheries production was 46.3 million tons, figure which exceeds beef and veal production by 15.6 million tons, and pork production by 16.8 millions.

In 1963, the world fisheries production was 47.4 million tons.

The contribution of the Latin American region to this spectacular development of post-war world fisheries has been decisive and in a way exceptional. Overall figures show that fisheries production in Latin America increased by 84% comparing the 1952-56 average with 1962. World production during the same period only increased by 69%. This gratifying situation is confirmed by the relative importance of the Latin American Region among fish producing countries. While during the period 1952-56, Latin America's share in world production amounted to only 3%, by 1964, it had reached 22% in 1962. Peru became the worlds leading producer of marine products.

It cannot be inferred however, from these figures that development of the fishing industry has been fully achieved, since the considerable progress that is attributed to the regions as a whole, applies only to a few countries owing to various factors, such as differences in productivity of Atlantic and Pacific fishing areas and the disparity of the economic structure of the different countries of the region. Roughly, for the only purpose of underlining some peculiar aspects of the problem, Latin America might be divided in the post-war

period into boom or acelerated development areas, continuous development areas and stagnation areas, according to the pace in its fisheries' development. Only two countries, Chile and Peru, may be included in the boom area.

Taking 1957 as the starting point of accelerated development in both countries, their combined production increased by 950% (1320 % to 1967) from that year until 1962, when the two countries accounted for 90% of the region's total production. The "continuous development area" should include Argentina, Brazil, Colombia, Cuba, Ecuador, Mexico and Panama, with a 68% (1964 comparison= 103%) increment during the same period and accounting for 9% of the region's total production. Production in the remaining Latin American Countries did not increase during this period and accounts for only 1% of the region's total.

These figures alone are a clear indication of the wide range of opportunities existing in the continent for the systematic development of its immense fisheries potential.

It should be noted, however, that expansion has been unevenly distributed not only in terms of geographical areas. A major feature in this development process roots in the unbalance observed between the fish-food sub-sector and the disposal of catch for reduction purposes. This is reflected in a much lower rate of increment in the utilization of fish for human consumption in Latin America, which between 1958 and 1963 shows an increase of only 50 percent. In terms of the disposition of the world catch for human consumption, Latin America's contribution amounts to only 4.5 percent of this total. Such a figure should be compared with the total share of Latin America in the world catch which was 19% in 1963. This is perhaps the most relevant aspect of the dramatic expansion observed in the fisheries of Chile and Peru.

(ii) Trends in international trade

The world import trade in fisheries products reached in 1963 the record figure of 15.3 million metric tons (live weight equivalent) or 37.0 percent of the volume of the world catch for the same year. In Latin America and excluding intra-regional trade, the share in world imports was only 2.0 percent in volume which as a whole was fishery products for direct human consumption. This corresponds roughly to 1/5 of the regional fish-food catch. The predominance of the reduction sector in the fisheries of Chile and Peru was reflected in the export trade from the region which also for 1963 reached in volume the 6.8 million metric tons (live weight) corresponding to 44.4 percent of the

total world exports and 77.3 percent of the regional catch. Again these figures in terms of fish for human consumption loose much of the world significance. In fact, exports of fish-food amount only to 3.6 percent of world export for human consumption and represent only 13.3 percent of the volume of regional catch.

The trade balance for fish-food in terms of physical volume (expressed in live weight of raw material) was for the period 1960-63, favourable on the average for Chile, Colombia, Ecuador, Mexico, Peru, Venezuela and Central America. Net importers were in the same period Argentina, Brazil, and Cuba. In the first group, the major exports were fish and shell fish, frozen and canned. In the second group cured fishery products had a major predominance in the import trade. In terms of value, regional exports amounted to 233 million U.S. dollars in 1963, of which 125 million U.S. dollars corresponded to the fish meal and fish oil exports from Chile and Peru and bout U.S.$ 73 million to exports of shrimps and lobster of which 58.3 million originated in Mexico, all other export products representing only about U.S.$ 35 million.

(iii) Consumption trends

Annual per capita production of fish-food roughly reflects consumption levels in Latin America due to the minor importance of the external trade in this sector. Therefore it is significant to note that Latin America ranks much below the world average which was 10.4 kgs . in 1963 and for the region only 6.5 kgs. This figure compares also rather unfavourably with other regions such as North America and Western Europe with per capita production of 13.4 kgs. and 18.5 kgs. respectively. However, this apparent unfavourable position represents, in fact, a great effort in the development of Latin American fisheries during the last 20 years. In 1938, per capita production of fish-food in the region was only 2.3 kgs.

The real importance of the fish consumption figures becomes evident when comparing them with those of other regions, in terms of fish protein in properties to total animal protein consumed. In this respect, South America compares favourably with countries of a high nutritional level, such as the Scandinavian countries. Chile, Peru and Ecuador, for instance, obtain one fifth of their total annual protein consumption from fish - as is the case in the aforementioned countries. This is also the case in other Latin American countries such as the Dominican Republic and Haiti, but they have to import their fisheries products from other continents, or from North America. In terms of per caput retention, that is considering fish for human consumption accounting for external trade as well, Peru, Chile, and Venezuela show the highest retention per capita

in South America with 17.6 kgs., 13.1 kgs. and 10.9 kgs. respectively, as an average for 1960-63. Lower figures are observed for Colombia with 2.9 kgs. and Mexico with 3.4 kgs. in the same period.

Rather significant increases show the per capita retention figures for Ecuador and Peru, comparing the average for 1950-53 and 1960-63, which have nearly duplicated in the first country and more than triplicated in the second.

(iv) Programs of international assistance

In general, FAO's action in Latin America has been developed within the basic orientation of fisheries development in the whole world.

FAO has thus utilized all the channels of action open to it, which, in addition to the activities carried out through the regular program, include the Expanded Technical Assistance Program, the United Nations Special Fund, the Freedom from Hunger Campaign and the World Food Program, all of which are complemented by multilateral programs in collaboration with other international and regional agencies such as UNICEF, UNESCO, ILO and IDB, or likewise benefiting from the valuable help provided by governments from other regions through bilateral assistance programs.

Considering all these programs as a whole, carried out under the direct responsibility of FAO, it may ne pointed out that, since 1951, FAO has sent nearly 100 experts in the various specialities in the field of fisheries, which among others include the promotion of research in fisheries biology and oceanography, studies on fisheries resources, inland fisheries, fishing boats and ports, fishing methods and gear, handling processing and distribution of fisheries' products, food inspection and sanitary control, statistics, economic studies, administrative organization, fisheries cooperatives, etc.

During the 1963/64 biennium, and only under the Expanded Technical Assistance Program, important research and fisheries development programs were being carried out in twelve countries in this region. In addition to the individual work of the FAO experts in certain countries, in some cases specific development projects were promoted, as in Brazil with the collaboration of the Inter-American Development Bank (IADB); in Uruguay with the Investment and Economic Development Commission; in Mexico, where advisers were provided in many fields and recently in aspects subsidiary to the construction and development of an important fishing port in Alvarado, State of Vera Cruz with the collaboration of

the National Cooperative Development Bank; and in Cuba, where FAO's assistance in fisheries is an important part of the assistance given to that country by the United Nations. Four training centers were also organized during that period with the participation of 147 specialists. Two of these centers covered the major fields of fisheries knowledge and the other two were devoted to intensive training in technology and inland fisheries resources.

Regarding FAO's participation in the United Nations Special Fund Program, it should be pointed out that one of the first projects that were prepared and approved in the region by that agency, was the Marine Resource Research Institute of Peru, which was established in 1960 and is now operating under the name of Institute of the Sea. Shortly after this, the National Fisheries Institute of Ecuador was created and in 1963, the Fisheries Development Institute in Chile, both of which are still under FAO's responsibility. In addition, another four projects have been approved and are ready to become operational in Argentina, Brazil, Central America and the Caribbean. All of these projects, because of their duration (5 years), the extent of the tasks to be carried out, and the fact that they must necessarily be continued under national responsibility, are undoubtedly of great significance for the development of fisheries in Latin America. Preinvestment studies will be carried out through these projects for which technical and research equipment was provided and the participation of international and for Peru and Venezuela are also being negotiated and will shortly be implemented by FAO as Executing Agency for the Special Fund.

Highly satisfactory results have been obtained also from FAO's collaboration with other international agencies. UNICEF participated with FAO in specific projects for the production of fishmeal for human consumption. The IADB initiated its collaboration with FAO in the field of fisheries through a feasibility study for the granting of loans and the development of marketing facilities for fisheries products in Sao Paulo, Brazil. This project was followed by others of great interest, such as the evaluation of the training facilities for professional in fisheries in Chile; and, recently, fisheries development was programmed in Uruguay with the collaboration of OAS and ECLA. Joint programs with ECLA were also started for the evaluation of fisheries resources and fisheries research in the whole continent, for which special consultants have been recruited. It should also be mentioned that FAO collaborated with the International Committee for European Migrations for the settlement of foreign fishermen in Latin America.

(b) Possibilities for Expanding Current Availabilities

(i) Possibilities for expanding production

Marine fisheries: Estimates have been formulated by authoritative sources that the combined fisheries production of Argentina and Brazil could increase in the present decade and expand to 4 or 5 million metric tons of raw material, or 2 to 2.5 million tons of fish per human consumption (edible weight, given on adequate intra-regional distribution) This would be substantial contribution towards the elimination of the protein deficit in this continent. The fisheries of the Pacific, particularly those of Chile, Peru, Colombia, Ecuador and Mexico are rapidly expanding. Actually, and because of, the fact that a major part of the Chile and Peru fisheries production is converted into fishmeal for export to other continents, the contribution of these two countries to cover nutritional deficits in this continent is relatively small, as is that of the Mexican shrimp efforts.

However, the enormous expansion of fisheries in Chile and Peru and the more moderate expansion of this industry in other countries have many implications in various other aspects that cannot be fully measured as yet. The necessary studies to achieve a better understanding of the fisheries problems are being promoted by governments with the assistance of international organizations. Fisheries development institutes have been established in several countries of the continent and many research stations are conducting extensive appraisals along the Pacific and Atlantic coasts, which will make it possible to obtain complete data on the continent's potential fisheries resources in the near future. The fact that countries like Chile and Peru, and to a lesser degree Cuba, Mexico, Brazil and Argentina, had to improvise the experience and technical knowledge of more advanced countries, turned out to be very favourable in the long run for the preparation of the human resources necessary to bring the fisheries industry up to the level of the region's largest industries. Present investments in the fisheries sector in connection with the fish meal industry in Chile and Peru only, amount to more than 350 million dollars, representing both land and sea installations that provide work for thousands and thousands of labourers, technicians and scientists. This human capital is of great significance for ensuring the progress of this sector and confirm the future feasibility of the fisheries "alternative".

Finally, it is hoped that once the accelerated expansion phase is concluded and the industry has been stabilized on the basis of integral fisheries development through the joint effort of governments researchers and industrialists, the distortions that originate the paradoxical situation of abundance not utilized by Latin Americans, in spite

of the critical scarcity of food in the region, may be eliminated. The privileged position of Latin America as the major suppliers of fish-protein concentrates at present represents an active capital and experience that are difficult to match in any other area in the near future. It may be anticipated that in future nutritional requirements in Latin America, the contribution of the fisheries will fully meet the demand.

Inland water fisheries: This is one of the most neglected sectors of the fisheries in Latin America. In 1963, fresh water species represented a little more than 2 percent of the total regional catch of all fish and shellfish. This percentage is substantially increased to 13 percent if the catch of fresh water species is compared with the total catch of marine fish-food. Mexico and Central America take the lead in the promotion of their inland water fisheries resources. Bolivia, Brazil, Peru and some Caribbean countries are showing a growing concern over the potentiality of their fresh water resources and some advances have been reported in fish and shellfish culture experiments and practices. Peru, Brazil, Colombia, Venezuela and Argentina rank in this order in terms of volume of catch, as major producers in the region. Extensive hinter-land areas in the Andean plateau served by an important network of lakes and rivers permit exceptionally good natural imvironments for wild stock exploitation and/or other more rational forms of stock improvements for very valuable cold water species for commercial and subsistence pruposes.

Tropical inland water fisheries show also good prospects in areas which have no easy access to fish suppliers from marine water. Fish culture in ponds which also offers great possibilities still represents a minor activity in this region and practices of combined fish farming with crop production are ignored or at least disregarded in agricultural activities.

(ii) Possibilities for increasing international trade

These possibilities appear to be very promising in two major fronts, such as intra-regional trade of fisheries products and exports to other continents. Imports from other continents will in long-range tend to decrease as far as present policies for self-sufficiency in fisheries, together with a more efficient use of existing intra-regional trade mechanisms, are succesfully achieved. The Central American Common Market and the Latin America Free Trade Area are already contributing to an increment in the intra-regional trade of fisheries products in their respective areas. Regional fisheries are highly diversified due to differences between the Atlantic and Pacific area

and largely in connection with their geographical location in the tropics or the temperate or cold sub-regions. Therefore, conditions which are not competitive may amply justify a process of economic integration by the complementation of several subsectors. In this process of integration, very important hinterland areas, which are now obstaculized by existing trade barriers, may also become open to intra-regional channels in fisheries products.

It appears that there are great possibilities for complementation through regional integration for certain canned fish and shellfish products, frozen fish or raw material for further processing, fish oils and fish meal. Import substitution for cured fish could also stimulate intra-regional trade. Research under way on fish protein concentrates may also prove that such products may become soon a commercial proposition for prompt relief of nutritional deficits in areas where low protein diets prevail. In this sense the privileged position obtained by the fish meal producing countries in this region, constitutes a unique asset in case regional trade obstacles are removed. At present and only from a nutritional point of view, the less protected strata of the population could already benefit from the regional production of fish protein concentrates by an adequate use of existing surplus facilities within well orientated welfare schemes which in the near future should have to count mainly upon the governments' support. The paradoxical situation created by massive exports of fish proteins from a protein starved continent to continents having much higher nutritional standards, could perhaps be reconciliated in a long term basis, through a better use of fish meal production and other high protein fish concentrates for direct human consumption by the population of this continent.

(iii) Possibilities for new or expanded international assistance

The fisheries in this continent have been a rather privileged sector for the granting of international assistance. In many cases such an assitance has substantially contributed to the spectacular development observed in the course of the last decade in the fisheries of Latin America.

The expected impact of the joint assistance of the U.N. Special Fund and FAO will be largely felt in the coming years in the materialization of investment propositions, large part of which may become eligible for the granting of credits for development purposes by international finance agencies. A big step forward in this sesnse has been recently given by FAO when it was agreed to serve as an advisory and executing agency to the Inter-American Development Bank and the International Bank for Reconstruction and Development in the implementation of joint programs in the Latin American region.

Table I - Fish Production and Consumption in Latin America

(live weight)

Catch	1938	1948	1958	1960	1963
			million metric tons		
World					
i)	21.0	19.5	32.6	38.5	46.4
ii)	18.3	17.0	27.3	29.9	33.4
Percentage utilized for human consumption	(87.1)	(87.2)	(83.7)	(77.7)	(72.0)
Latin America - 45 countries - Central and South America according to list attached					
i)	0.3	0.6	1.8	4.7	8.8
ii)	0.3	0.6	1.0	1.1	1.5
Percentage utilized for human consumption	(100.0)	(100.0)	(55.6)	(23.4)	(17.0)
			thousand metric tons		
Peru i)	4.8	47.7	930.2	3531.4	6901.3
Chile i)	32.2	64.6	225.8	339.6	762.8
Others i)	250.0	520.0	660.0	830.0	1140.0
Percentage of World Catch:					
Latin America i)	(1.4)	(3.1)	(5.5)	(12.2)	(19.0)
ii)	(1.6)	(3.5)	(3.7)	(3.7)	(4.5)
			million metric tons		
North America i)	3.1	3.5	3.8	3.8	3.9
ii)	2.5	2.8	2.7	2.7	2.8
Western Europe i)	5.6	6.1	7.4	7.7	8.4
ii)	4.3	4.9	5.9	6.0	6.2
Asia (excluding Japan and Mainland China) a/					
i)	5.0	4.1	4.9	5.3	6.1
ii)	5.0	4.1	4.9	5.3	6.1

	1938	1948	1958	1960	1963
Average Annual Per Caput Production			kilograms		
World					
i)	9.6	8.1	11.3	12.8	14.4
ii)	8.3	7.1	9.5	9.9	10.4
Latin America i)	2.3	3.8	9.0	22.3	38.5
ii)	2.3	3.8	4.7	5.0	6.5
North America i)	21.9	21.9	19.8	19.1	18.7
ii)	17.7	17.5	14.1	13.6	13.4
Western Europe i)	20.1	19.9	23.1	23.6	25.0
ii)	15.5	16.3	18.4	18.4	18.5
Asia (excluding Japan and Mainland China)					
i)	7.9	5.9	5.7	5.9	6.3
ii)	7.9	5.9	5.7	5.9	6.3
			million metric tons		
International Trade (140 countries) b)					
Estimated Annual World Imports: Total	4.3	3.8	8.0	10.5	15.3
(% share of world catch)	(23.0)	(20.0)	(29.0)	(32.0)	(37.0)
For human consumption	3.5	3.4	4.7	5.1	5.5
(% share of world imports)	(81.4)	(89.5)	(58.7)	(48.6)	(35.9)
Latin America (excluding intra-regional trade):					
Imports: Total	0.2	0.2	0.2	0.3	0.3
(% share of total world imports)	(4.7)	(5.3)	(2.5)	(2.9)	(2.0)
For human consumption	0.2	0.2	0.2	0.3	0.3
(% share of world imports for human consumption)	(5.7)	(5.9)	(4.3)	(5.9)	(5.5)
(% share of regional catch)	(66.7)	(33.3)	(20.0)	(27.3)	(20.0)

	' 1938	' 1948	' 1958	' 1960	' 1963
International Trade (140 countries) b) (cont.)			million metric tons		
Exports: Total	Ø	Ø	1.1	3.4	6.8
(% share of total world exports)	(0.5)	(1.0)	(13.3)	(32.4)	(44.4)
(% share of regional catch)	(7.3)	(6.1)	(61.1)	(72.3)	(77.3)
For human consumption	Ø	Ø	0.1	0.2	0.2
(% share of world exports for human consumption)	(0.6)	(1.1)	(2.1)	(3.9)	(3.6)
(% share of regional catch)	(7.3)	(6.1)	(10.0)	(18.2)	(13.3)
Estimated Average Annual Per Caput Consumption			k i l o g r a m s		
Catch ii)	2.3	3.8	4.7	5.0	6.5
Imports ii)	1.5	1.3	1.1	1.2	1.3
Exports ii)	0.2	0.2	0.7	0.9	1.0
Total	3.6	4.9	5.1	5.3	6.8
Catch for human consumption as % of total consumption	(63.8)	(77.5)	(92.1)	(94.3)	(95.5)

i) Figures refer to total catch;

ii) Figures refer to quantities utilized for human consumption only.

a) The quantity of fish used for "Reduction" in Asia (excl. Mainland China and Japan) is very small.

b) For what refers to international trade, statistics are available for 140 countries (Mainland China is the major country among those missing). In comparing trade with catch we have considered the same 140 countries also for the latter.

Source: Fishing Statistics Section, Economics Branch, Fisheries Division, FAO Statistics Division, FAO (Population Statistics).

CENTRAL AMERICA

Antigua
Bahamas
Barbados
British Honduras
Cayman Islands

Costa Rica
Cuba
Dominica
Dominican Republic
El Salvador

Grenada
Guadeloupe
Guatemala
Haiti
Honduras

Jamaica
Martinique
Mexico
Montserrat
Netherlands Antilles

Nicaragua
Panama
Panama Canal Zone
Puerto Rico
St. Kitts-Nevis

St. Lucia
St. Vincent
Trinidad and Tobago
Turks and Caicos Islands
Virgin Islands (UK)
Virgin Islands (US)

SOUTH AMERICA

Argentina
Bolivia
Brazil
British Guiana
Chile

Colombia
Ecuador
Falkland Islands
French Guiana
Paraguay

Peru
Surinam
Uruguay
Venezuela

TABLE II Fish Production and Consumption in selected countries in Latin America

	1950-53 average				1960-63 average				Average per caput	Annual consump.	For other purposes	
	Catch	Imports	Exports	Retention	Catch	Imports	Exports	Retention	1950-53	1960-63	1950-53	1960-63
	thousand metric tons (live weight)								Kilograms		Kilograms	
ARGENTINA												
for human consumption	64.1	1.7	0.7	65.1	90.3	5.4	1.4	94.3	3.7	4.5		
fresh, frozen, etc.	39.4	0.1	0.5	39.0	61.4	1.4	1.4	61.4	2.2	3.0		
cured	3.8	1.3	0.2	4.9	3.7	3.3	Ø	7.0	0.3	0.3		
canned	20.9	0.3	Ø	21.2	25.2	0.7	Ø	25.9	1.2	1.2		
for other purposes	8.7				12.1						0.5	0.6
BRAZIL												
for human consumption	161.7	104.5	Ø	266.2	325.0	79.0	3.0	40.10	4.9	5.5		0.1
for other purposes					5.0							
CHILE												
for human consumption	82.2	0.1	2.0	80.3	107.0	0.4	2.3	105.1	12.8	13.1		
fresh, frozen, etc.	51.2		0.4	50.8	77.3	Ø	0.9	76.4	8.1	9.5		
cured	2.0	Ø	0.2	1.8	4.7	Ø	Ø	4.7	0.3	0.6		
canned	29.0	0.1	1.4	27.7	25.0	0.4	1.4	24.0	4.4	3.0		
for other purposes	20.0				435.7						3.2	54.5
COLOMBIA												
for human consumption	16.0	2.8	Ø	18.8	44.0	Ø	1.5	42.5	1.6	2.9		
fresh, frozen, etc.		Ø	Ø		37.0	Ø	1.5	35.5		2.4		
cured		Ø	Ø		6.0	Ø	-	6.0		0.4		
canned		2.8	-		1.0	Ø	-	1.0		0.1		
for other purposes												
CUBA												
for human consumption	9.9	54.4	1.5	62.8	33.1	33.3	1.3	65.1	11.2	9.3		
for other purposes					Ø						Ø	
ECUADOR												
for human consumption	9.4	2.8		12.2	44.0	1.0	12.5	32.5	3.7	7.2		
for other purposes					1.0							0.2

TABLE II Fish Production and Consumption in selected countries in Latin America (cont.)

	1950-53 average				1960-63 average				Average per caput consump.		For other purposes	
	Catch	Imports	Exports	Retention	Catch	Imports	Exports	Retention	1950-53	1960-63	1950-53	1960-63
			Thousand metric tons		(live weight)				Kilograms		Kilograms	
MEXICO												
for human consumption	68.7	2.5	31.2	40.0	190.0	3.4	70.0	123.4	1.5	3.4		
for other purposes					30.0							0.8
PERU												
for human consumption	76.0	1.2	32.0	45.2	258.7	1.5	62.9	197.3	5.2	17.6		
fresh, frozen, etc. a/		0.1	12.0		170.0	0.2	30.5	139.7		12.5		
cured		0.3			26.4	0.3	1.1	25.6		2.3		
canned		0.8	20.0		62.3	1.0	31.3	32.0		2.8		
for other purposes	45.0				5413.3						5.2	483.3
VENEZUELA												
for human consumption	69.8	5.1	2.4	72.5	86.7	5.9	7.5	85.1	13.4	10.9		
fresh, frozen, etc.					34.6	0.2	3.8	31.0		4.0		
cured		1.8	0.9		19.2	2.9	0.3	21.8		2.8		
canned		3.3	1.5		32.9	2.8	3.4	39.3		4.1		
for other purposes					4.0							0.5

a/ Including the catch of freshwater fishes for which it is not possible to have the disposition.

SOURCE: Fishery Statistics Section, Economics Branch, Fisheries Division, FAO.
Statistics Division, FAO (Population Statistics).

Notes on Current Availability and Possible Expansion of Supplies of Grain Legumes in the Latin American Region.

(a) Current Availability of Grain Legumes in Latin America.

(i) Levels and trends in consumption of pulses in Latin America.

Data on consumption of pulses are available from food balance sheets for 17 Latin American countries covering about 90% of the population of the region. On the basis of these data, regional average consumption in recent years works out at well over 40 g. per caput per day which is higher than the average consumption in any other region. Pulses provide nearly 15% of the total protein supply of 67 g. per caput per day which is a particularly satisfactory feature of the diet in Latin American countries in view of the high nutrional value of protein mixtures from cereals and pulses. Consumption is highest in Brazil and Mexico amounting to over 60 and some 55 g. per caput per day respectively. In these countries, pulse protein is compensating for the relatively poor quality of proteins from the staple foods, cassava in Brazil and maize in Mexico. In all other countries average consumption falls between 20 and 40 g. per caput per day, except in Argentina and Uruguay, which are below 20 g. per caput per day, where pulses are not in great need in view of the high consumption of animal protein.

Beans are the most common pulse in Latin America accounting for over 80% of the consumption of total pulses. Next in importance are chickpeas, followed by peas, pigeon peas, lentils and cowpeas. Over the last decade, the average regional consumption per caput has increased by over 5%. Increases were particularly large in Chile and Mexico while in other Central American countries as well as in the River Plate countries there was little increase and in some countries, notably Venezuela and Paraguay, consumption actually declined.

(ii) Trends in the production and external trade of pulses in Latin America.

Latin America is an important producer of pulses. Production during 1960-62 in the 17 countries for which food balance sheet data are available is estimated at 3.2 million metric tons per annum which accounts for some 10% of the total world production. Production is highest in Brazil with 1.8 million metric tons followed by Mexico with .8 and Chile with .1 million metric tons.

Over the period 1948-50 to 1960-62 production is estimated to have increased by 35%. Increases have occurred throughout the period but have been largest during the 1960's. The increase was shared by the majority of countries and Brazil and Mexico, the big producers, contributed most. Considerable though the increase in production was, it was not sufficient to meet domestic demand as during the same period population has grown by 37%. This large increase is due to some extent to active encouragement of production reflecting the increased recognition of the importance of pulses in the diets of the area. This figure should, however, be judged with some caution as in part the higher figure for recent years may be due to better reporting rather than actual increases in production. The observed increase in the per caput consumption of pulses was therefore entirely due to a shift of the region from a net exporter of pulses during the early postwar years at the rate of some 5% to a net importer during 1960-62 although only at a marginal level of 1-2% of production.

(b) Possibilities for expanding Current Availabilities.

(i) Possibilities for expanding production.

Several studies on food and nutritional policies in Latin America have led to a recommendation of an increase of supplies of protein-rich food for human consumption. So far as food habits and production conditions in a regions are favourable for animal protein consumption, there is no need for change. However, there are regions which cannot afford, in the foreseable future, much expansion in animal production and are without economic possibilities for importation of high quality food. The improvement of locally available protein-rich food crops, mainly grain legumes, would be the cheapest solution.

Unfortunately, current credit and marketing arrangements facilitate the increased production of cash crops such as coffee, bananas, cocoa and sugar. This now means that the situation regarding food crops, particularly those rich in protein, such as grain legumes, is quite serious.

There is an adequate potential in Latin American countries for a substantial increase of the grain legume production for human consumption. Without doubt, one of the possible means of increasing production is by better utilization of land areas already under cultivation. However, to break away from the traditional system of monoculture prevailing in many countries of the region to a diversified cropping, and to intensify the production of grain legumes will call for considerable effort on the part of agronomists and extension workers in such work as improvement of soil fertility, plant breeding, seed

production, mechanization and improved equipment, improving crop rotation, developing more efficient disease and pest control methods, and in reducing the losses of harvested and stored products.

a) In general, the use of fertilizers in Latin America calls for substantial investment and necessitates a change from production for subsistence to production for the market. This requires increased credit facilities for the farmers and the development of organized market facilities as contrasted with a subsistence economy.

b) In the future, new and better tools should become available for plant genetics research. It is probable, however, that most global increases in production will come about through the introduction of classical methods of plant breeding, thus improving crops in developing areas. If such developments are to be of practical consequence, they must be accompanied by better seed multiplication and distribution.

Plant breeding aims at obtaining high yield crops, crops better suited to the environment and with higher resistance to pests and diseases. These pests and diseases can also be controlled, of course, by the application of physical and chemical agents or by biological control measures, which would require readily available supplies and instruction and supervision in their use.

c) Power mechanization on a large scale offers great difficulties in developing countries. It is costly, especially in terms of foreign exchange; there are high rates of depreciation, repairs are frequently required and expensive. Areas which suffer from shortage of labour and where facilities exist for the repair or new implements are the most fertile ground for their spread. However, readily available credit and guidance in the use and maintenance of such equipment, is very important.

d) Research on rotation, inter-cropping, planting density and planting systems has been rather limited and most of the findings have still to be translated into field practices.

e) Chemical control of pests and diseases has become increasingly important in the last few decades, particularly since the development of organic pesticides. Although the application of these products is responsible for considerable agricultural progress in Latin America, their impact on the agriculture in these countries has been slight. Generally, they cost more than the farmers can afford, nor are the extension services adequate to assure that the farmers would know how to use them properly.

f) Substantial research and extension is needed in the control of post-harvest losses, handling and storage of train legumes. At present, it is difficult to estimate the overall world loss in harvested crops, as this varies from region to region and from crop to crop. But despite the lack of accurate world statistics, there is no doubt that post-harvest losses are highest precisely in those areas least able to afford them.

Latin American governments seem to be well aware of the gravity of the situation and they are making a great effort ro raise food production. Thus, with regard to beans, work on genetic improvement, seed multiplication, bean diseases in Mexico, Colombia and Central America countries, is being carried out through the technical cooperation of the Rockefeller Foundation, USAID and IAIAS (Inter-American Institute for Agricultural Sciences). In spite of these efforts, there is still a great need for assistance in this field, if even the modest targets of the Third World Food Survey are to be met.

Possible measures, by order of priority, for improving the situation, may be summarized as follows :

1. Establishment of training centres, seminars and short courses for all categories of people ranging from farmers to research workers for better cultivation and consumption methods of grain legumes to help overcome protein malnutrition.

2. Evaluation of native and introduced varieties suitable for local conditions.

3. Establishment of living collections and genepools for different species of grain legumes.

4. Intensification of plant breeding and seed production and improvement of distribution.

5. Research on better cultivation methods, including fertilization, mineral nutrition, etc.

6. Strengthening local extension services personnel by a grain legumes specialist who, through the extensionist will pass on to the farmer new, applicable findings from legume research and improvement tests.

The task of reaching these targets would nevertheless be hard, for attempts to change are likely to be impeded, not so much by technical problems or even by scarcity of resources, as by the often static character of the social and economic systems. The essential educational and political task of enlisting continued understanding and support of producers and consumers is one of the most important to achieve.

(ii) Possibility for expanding international trade.

World trade in beans, peas, lentils and other dried legumes has remained fairly stable in recent years at about 1.2 to 1.3 million tons, but Latin American exports have been expanding. The composition of trade in Latin America reflects the changes in the patterns of production. Mexico has greatly increased its export trade reflecting a marked growth of cultivation, particularly of beans, and has now become an exporter, while the decline in Chile's sales may be checked by the recent recovery of production of beans. As regards imports, no recent data are available for Cuba, the world's largest importer in 1959, but imports into Venezuela, Peru and Brazil are tending to rise either because production is not keeping pace with consumption, or is actually decreasing. Latin America produces few dry peas and relies on the United States for imports. However, the scope for increasing these (e.g. for canning) is limited by national import controls.

(iii) Possibility for new or expanded international assistance.

The main objective of FAO in this matter is to try a regional approach to areas of similar ecological conditions and similar food habits by training local staff in improved production methods With the help of UNICEF, training centres could be set up in selected areas and in the different countries to educate enough personnel to develop their local protein resources.

Besides these training centres, special projects may be set up in regions of the continent, or in countries to increase local protein production in the most economical way through improvement of protein-rich crops for direct human consumption, by improving the productivity of land devoted to the feeding of animals, and by strengthening a well-balanced diversified agriculture.