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TRADITIONAL PRACTICES CONCERNING DIETARY MANAGEMENT DURING AND AFTER DIARRHOEA

(With Special Reference to
Acute Dehydrating Diarrhoea in Young Children)

Diarrhea - diet therapy
Food habits

By

E. F. Patrice Jelliffe
Derrick B. Jelliffe
Keith Feldon
Ndolamb Ngokwey

Population and Family Health Division
School of Public Health
University of California
Los Angeles

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(I) INTRODUCTION

In the developing countries malnutrition is widely prevalent, acute diarrhoea is one of the commonest illnesses and dehydration one of the most frequent precipitating causes of death in young children. It is estimated that there are 145 million malnourished under-five year old children world-wide (WHO, 1985) and from 4-5 million diarrhoea deaths per year with over three-quarters occurring below two years of age. In developing countries, between 2 and 12 bouts of diarrhoea are estimated to occur in a young child annually, with a yearly total of over one thousand million attacks.

New scientific developments have revolutionized the treatment of acute diarrhoea in children and current understanding of the nutritional and development principles underlying the growth of young children make prevention of malnutrition, even in the presence of poverty, a real possibility.

The most effective acceptance of modern treatment can best be achieved by dove-tailing traditional practices and technical methods, based on current scientific knowledge. Recent knowledge indicates that decreased food intake during and after acute childhood illnesses such as diarrhoea is a major precipitating cause of protein-energy malnutrition. The actual treatment of acute diarrhoeas in children has been revolutionized by the discovery of oral rehydration therapy. One consequence of these developments is the understanding that feeding should be maintained during diarrhoea (with only a few hours at most of reducing food intake with the exception of breastmilk while rehydration is started) and that food intake should be increased during convalescence to allow for "catch-up". Thus it is important to identify culturally-defined beliefs, attitudes and practices, regarding feeding in diarrhoea, particularly foods which in different cultures may be recommended, avoided or thought to be causative. This is because advice concerning feeding during and after diarrhoea has to take into account cultural concepts concerning foods considered to have an impact on the disease and traditional non-dietary forms of therapy. These can then be incorporated into treatment advised by health workers, if appropriate, as a part of cultural integration, making acceptance of advice and technical management more likely. This investigation was undertaken to obtain such information as was available on traditional practices in different parts of the world.

A detailed document discussing the principles of dietary management during and after diarrhoea in young children is available [107] as a companion document to this report.

(II) METHODS OF INFORMATION COLLECTION

(1) Categories and sources of information

The search for information included reports on traditional views concerning dietary practices - foods believed to be causative, avoided or recommended during and after diarrhoea, and other relevant cultural considerations - concepts of body physiology, non-dietary aetiology and other therapy in diarrhoea.

The information was obtained through four main channels: literature, correspondence, discussion and response to journal announcements.

(1) Literature. A wide variety of journals, books and reports have been reviewed. These included known sources (including the UCLA Center for the Study of Comparative Folklore and the HRAF (Human Relations Area Files), together with a systematic review of journals thought to be likely sources of information*.

*Medical Journals. Journal of Tropical Pediatrics, Ecology of Food and Nutrition, Tropical and Geographical Medicine, Acta Tropica, Medicine Tropicale, Tropical Doctor, Children in the Tropics, Journal of the Egyptian Medical Association, East African Medical Journal, Ethiopian Medical Journal, Revista do Instituto de Medicina Tropical de Sao Paul, Anal do Instituto de Medicina Tropical (Lisboa).

Social Science Journals. Human Organization, Medical Anthropology, Medical Anthropology Quarterly, Social Science and Medicine, Ethnomedizin, Culture, Medicine, and Psychiatry, Journal of American Folklore, Western Folklore, Asian Folklore, American Anthropologist.

In addition, a programmed literature search was made, through The Institute of Scientific Information (ISI), Philadelphia; the Child Nutrition in Developing Countries List, Canberra, Australia, and from Maternal and Infant Nutrition Reviews, International Nutrition Communication Service (INCS), Newport, Massachusetts.

(ii) Correspondence. A general letter soliciting information was sent to well-informed colleagues in many countries. These included members of Nutrition Institutes and similar groups in different parts of the world, as listed by the International Union of Nutritional Sciences, members of the Nutritional Anthropological Society and various authorities known to the authors. 50 Nutrition and 96 Pediatric Societies around the world were contacted also. In addition the following research institutes concerned with relevant food crops were written to: CIAT, Colombia; CIMMYT, Mexico; CIP, Peru; ICARDA, Syria; ICRISAT, India; IITA, Nigeria; IRRI, Philippines.

(iii) Discussion. Detailed enquiries concerning this subject were made while visiting countries, notably Indonesia, and in discussions with colleagues from various countries, including Bangladesh and India.

(iv) General Announcement. An announcement and request for information was published in letter form in the Medical Anthropology Newsletter (August 1984).

(2) Limitations

Before discussing results, it is necessary to mention the degree of reliability and any limitations and ambiguities in the methodology used.

(i) Coverage. The information required is widely scattered through an extremely large range of books, journals and other publications, covering a variety of disciplines. It is often "buried" and not indicated by the titles of articles and books, and is often not the main focus of publications. This poses problems in identifying relevant literature. Data were received from 74 countries covering most parts of the world (Table 1). Information was available from several sources from some countries. Most information received was from recent years. However, some reports were from earlier decades since when practices may have changed. Most of the literature and information from other sources (61.7%) relates to young children in developing countries.

(ii) Type of information reported. The information obtainable from the literature depends considerably on the training, perspective and sometimes the bias of the investigators. The type of information on traditional practices and the emphasis given varies greatly, for example, between medical and anthropological workers. Also, it is very unusual to find definitions concerning, for example, details of the diarrhoea and diet.

(iii) Definition of diarrhoea. Another difficulty related to the vexed question of the definition of diarrhoea. This applies equally to traditional terms (e.g. "running belly", "belly operate him" [78], "white" [1] or "red" diarrhoea [152]), as well as to classifications by medical or anthropological workers. This is understandable as diarrhoea is not a disease, but a symptom-complex, characterised by frequent loose or watery stools. It ranges from being acute to chronic, and differs with the child's age, the dose, virulence and type of responsible organism and the individual's nutritional status. Apart from such relatively specific clinical syndromes as acute dysentery, with blood and mucus in the stools, and cholera, with very severe, "running-tap" rice water stools and collapse, it is usually difficult to differentiate various infectious causes of diarrhoea without sophisticated laboratory investigations, which are rarely available.

However, although diarrhoea is an important and potentially serious condition at any age, most information correctly focusses on its occurrence in infancy and during the weaning period. This emphasis is not only because it is common, but also because of the high risks of death from acute dehydration, and because of its role in contributing to the development of subsequent malnutrition.

(iv) Dietary detail. Accounts rarely differentiate between food used traditionally during acute diarrhoea and immediately afterwards - that is during early convalescence. Also, dietary and culinary details concerning the preparation of foods, the frequency of feeding, the amounts used, the strength or concentration, and the variable proportions used in food mixtures (depending, for example, upon seasonal availability) are given in very few publications. It is most difficult to be precise in these matters. Examples include the observers' use of terms such as "gruel", "broth" and "porridge". The consistency of various traditional rice preparations, such as "rice water"*, congee, sopa de arroz and bubor [151] also varies. This critical issue of concentration has been emphasized recently in the medical literature, when rice water has been compared with less dilute, much more effective rice powder oral rehydration solution [157]. The use or restriction of water or breast milk is not necessarily always noted. This is in contrast to the widespread reports of the administration of traditional herbal infusions.

(v) Foods as drug therapy. In some cases, foods are given during and after diarrhoea because they are believed to have special therapeutic effects. Examples include, pectin-containing foods, such as carob bean powder, apple, guava, baobab (Adansonia digitata), and Indian wood apple (Aegle marmelos). The pectin effect does not affect dehydration, but may mask the looseness of the stools by absorbing water. However, the starch and sugars in some of these items may have a nutritional-metabolic effect, increasing absorption of sodium and water.

(III) RESULTS

The information obtained was analyzed into two main overlapping categories: (1) Dietary practices - (i) foods believed to cause diarrhoea, (ii) foods avoided - in general during diarrhoea and in pregnancy and lactation, (iii) foods recommended for diarrhoea; (2) Cultural considerations - (i) concepts of body physiology in diarrhoea, (ii) beliefs about non-dietary causes of diarrhoea, (iii) other therapies for diarrhoea.

The foods listed are presented, where appropriate, in the categories that together make up "weaning multimixes" - staples, animal products (including human milk, animal milks), legumes (pulses), and vegetables particularly dark green leaves and orange-pigment vegetables and fruits). In this way the cultural concepts can be related to scientific nutritional ones. "Multimixes" are staple-based food mixtures consisting of nutritionally complementary, everyday, least cost foods, which have culinary feasibility and are culturally acceptable [29, 104, 109]. The term "animal product" is used rather than animal protein to emphasize the content of fat, glycogen and other nutrients, and to de-emphasize its commonly perceived, incorrect role as the main source of protein.

Fruits and oils (important in assuring a high energy density) and other miscellaneous items are noted. Methods of preparation of foods are given, with special reference to their culturally-defined properties (e.g. "greasy", "sour", "heavy", "stale", etc.).

The same food was sometimes considered differently in different regions of a country. For example, in Pakistan, rice preparations were usually recommended during diarrhoea [93, 117], but were considered to be causative in one area [203]. Maize (corn) is classified as "cold" in two reports from Mexico [68, 152], but is stated to be "hot" by one author in the same country. Thus statements attributed to any country should not be considered as necessarily applying to all of that country.

*Rice water: whitish fluid left after rice has been boiled. It is a dilute rice suspension of varying concentration.

The number of countries reporting a cited belief or practise is indicated in the text. Figures in curved brackets (e.g. (49)) indicate the number of statements recorded. This usually differs from the number of countries because several papers could be from one country, and various regions could be included in a publication concerning one country, especially a very large one (e.g. India). References are given in square brackets (e.g. [200]).

(1) Dietary practices

(i) Foods believed to cause diarrhoea

Many foods are believed to cause diarrhoea in different parts of the world. However, according to available information, the three main dietary causes reported were: animal products, certain vegetables and fruits, and "incorrect" food preparations.

Animal products were reported to be thought to cause diarrhoea in twenty-three of the seventy-four countries surveyed (49): meat (especially pork), and eggs were most commonly mentioned (in sixteen and eleven countries respectively). Undiluted animal milks were thought to be causative in some communities in thirteen countries (13) and breastmilk in ten (12).

A wide variety of different vegetables and fruits was incriminated in twenty-two countries (49), especially yellow or green products. "Incorrect" food preparations were believed to be causative in twenty-two countries (36), including inadequately cooked, spicy, salty, stale or "contaminated" items, staple preparations (usually in solid, non-porridge forms) were cited in eleven countries (18), and legumes and oil seeds in eleven as well (13).

The reasons for these beliefs were rarely given. Foods considered especially harmful because of cultural concepts of body physiology are mentioned later. Detailed responses are given in Annex A.1.

(ii) Foods avoided during diarrhoea

Items from an extensive range of foods may be avoided in different countries. Avoidance practises often vary even in the same area, or between areas. Frequently, there is a reference to "cutting down", "reducing", "withholding", "stopping", or "diluting". The four main dietary avoidances were: animal products, cited in thirty-two countries (78) (especially milk (16), fish and seafood (12), eggs (13), meat (11); certain methods of food preparation in twenty-one countries (42) (including "greasy", "heavy", "spicy", etc.), vegetables and fruits in nineteen (43) (including yellow and green vegetables and citrus and "watery" fruits, such as melons), thicker preparations of staples in seventeen (35), and legumes and oil seeds in seventeen (22).

Less commonly mentioned items included water in nine countries (10) and oils or fats in five (7). Practices regarding breast milk seemed variable and often uncertain as its continuance or avoidance was often not recorded. However, twenty-one countries (27) reported a variable restriction of breastfeeding, either less frequent feeds (4) or stopping for a time (17).

Some foods were commonly believed, if eaten in pregnancy and lactation, to cause diarrhoea in mother, foetus and newborn, and ill effects of the wrong maternal diet could also, it was believed, be transmitted via breastmilk to the neonate. Such beliefs regarding the dyadic relationship between mother and baby led to proscriptions of certain foods during pregnancy and lactation. Most reports did not indicate whether such food restrictions applied to pregnancy, lactation or both. The main items were animal products cited in nine countries (21), meat (5), fish (4), milk (4), eggs (3), certain vegetables and fruits in eleven countries (42) and legumes in six (6) and properties of prepared foods (seven countries) (8). In four countries (5) where there was more than one staple, some root staples were avoided rather than the main cereal. Miscellaneous items mentioned included spices, sugar cane, mustard oil and water. These avoidances sometimes related to cultural ideas involving body physiology, such as the hot-cold classification mentioned later. Detailed responses on foods avoided are given in Annex A.2.

(iii) Foods recommended in diarrhoea

The main foods reported as recommended in diarrhoea were less concentrated preparations of staples or starchy, mainly carbohydrate non-staples in fifty-one countries (198), certain vegetables and fruits in forty-two countries (68), animal milks, including fermented preparations in twenty-six countries (50), fluids (water with added salt, sugar, honey or carbonated drinks in twenty-two (32), animal products in nineteen (30), legumes and oil seeds in seventeen (25), and oils and fats in ten countries (8).

Staples. Dilute preparations of one or more of a country's staples were commonly recommended during diarrhoea, sometimes after a period of starvation (198). These were usually cereal grains (148), including rice (83), wheat (32), maize (corn) (13), millet (7), barley (7), oatmeal (3), sorghum (2) and teff (1). Non-cereal staples were reported fifty times, including potatoes (12) and cassava. Thus, in Indonesia, the staples in each area of this large country were recommended in diarrhoea, e.g., rice, maize, or sweet potato, as appropriate [146].

Only occasionally did an imported product replace the main staple. An example is the use in diarrhoea of barley in West Bengal and Bangladesh or commercially prepared wheat products (e.g. biscuits or toasted bread) sometimes crumbled and made into a suspension in water [100, 180]. Some of the food items listed are bland, starchy, largely carbohydrate foods, such as banana (16), arrowroot (9) and plantain (3) that are not considered to be staples in the countries concerned.

In many countries the staple is given in relatively dilute or semi-solid form (e.g. rice water, gruels, porridges: maize (atole) (Guatemala) [27], parched wheat porridge (Barbados) [78] and sweet potato gruel (area in Indonesia [146]). Sometimes semi-solid or solid preparations seem to be advocated early on.

There is a common progression over the period of recovery from dilute preparations of staple foods - suspensions, gruels or thinner porridges - to thicker more concentrated semi-solid preparations. However, the reports often did not specify many terms used concerning the form or consistency in which the food preparation was consumed.

In a few areas, other foods are added to the staple early on, probably in convalescence. These include pounded fish added to rice in the Philippines [94], legumes in India [17] and a potato-rice mixture in Bolivia [5].

Food from animals. Fifty statements concern the use of various milks, with cows' milk predominating. Whole or diluted milk was mentioned twenty-six times, sweet buttermilk in five countries and soft cream cheese in four. In some animal milk-drinking parts of the world, including India [17] and Pakistan [203], acidified milk products, including curd and yoghurt are given (13). Their use is often based on hot-cold concepts of body physiology as discussed later.

Other animal products were recommended in 22 statements. They included fish (9) often of a specified type, such as catfish in Bangladesh [180], eggs (8), meat (6) and chicken (6).

Human milk. Special mention of breastfeeding during diarrhoea was made in only nineteen statements. In four, it was stopped, in another four feedings were decreased and, in eleven it was given on demand. In most cultures breastfeeding is not regarded as the giving of food as such, but as an automatic part of mothering. This may account for the very few references to it in the literature.

Detailed responses on foods recommended in diarrhoea are given in Annex A.3.

Fruits. The use of various fruits was mentioned twenty-four times. They were usually given as soft preparations - ripe or very well cooked, and often sieved. Apple was most frequently reported from Europe [127, 129, 185] and among Chinese populations [219] given as a purée or as a "soup". In Egypt, apple juice was reported to be used [1], and in some Latin American countries, such as Brazil [47], mashed apple was mentioned (3). Citrus juices were mentioned fifteen times.

Vegetables, legumes and oils or fats. Of the eighteen references to vegetables being given in diarrhoea, carrot is the most frequent (11), either as soup in Niger [37], Bulgaria [129] and Guatemala [27] or as juice in China [219]. Less frequently mentioned were legumes and oil seeds (17) and oils or fats (10).

(2) Cultural considerations

It is important to understand those aspects of the culture which influence food behaviour in diarrhoea. The findings of this investigation are presented in three overlapping categories: (i) relevant concepts of body physiology and the nature of food, (ii) beliefs regarding non-dietary causes of diarrhoea, and (iii) non-dietary therapy of diarrhoea. Details are given in Annexes: B:1-3.

(i) Relevant concepts of body physiology and the nature of food

Any health professional who wishes to influence attitudes towards diarrhoea must understand the culture's beliefs regarding health, illnesses, treatment of diseases, inherent qualities of foods, and concepts of body physiology: its ethnomedical system.

(ii) History

Many existing systems appear to be founded on ancient Indian Vedic writings. These spread to Greece where they were the basis for the humoral medicine of Hippocrates (5th Century B.C.). The four major bodily humours described by Galen (130-200 A.D.) consist of contrasting elements: yellow bile (fire), dry and hot, black bile (earth), cold and dry, blood (air) hot and moist, phlegm (water) moist and cold, [100, 101, 200].

These systems spread through Europe and were exported to South America by the conquistadores and existing classifications worldwide often involve similar "principles of opposites" [68] or "the avoidance of opposites" [131]. The humours of "contrasting complexions" affect the balance of the main body organs, the brain (wet and cold), the liver (wet and dry) and the heart (dry and hot) [67, 68, 69].

The most commonly used classifications are either related to the widespread hot-cold dichotomy or to a male-female or light-darkness classification. Examples of the former are caliente/frío, in Latin America [67, 152, 153] and garam/tonda in India [100]. The latter system is exemplified by benda panas/benda sejok in Malaysia [151], yin-yang (male/light, female/darkness) in China [101], am/duong in Vietnam [110], noche/día, luz/obscuridad in Bolivia [5]. A wet/dry classification is used in Ethiopia [2] (for example the belly which is normally dry becomes wet in diarrhoea) and Malaysia [143] and in Hong Kong among the Chinese population [126]. Here it is stressed that the balance of body energies must be taken into consideration and hence liquids in diarrhoea would be foods of choice as they can be a concentrated source of energy and yet easily digested.

Hot-cold

Body heat is thought to be acquired via thermal influences, exercise, hard work, illness, emotional upsets, etc., and, like cold, via the metaphorical inherent heat in some foods, including some herbal preparations. Thus, the health of an individual depends on his body being in equilibrium, neither heated nor cooled by thermal or metaphorical heat or cold. In Mexico, healthy individuals are believed to be warm, women cooler than men, and the elderly cooler than children. Children are thought to be cold and vulnerable to cold in many cultures [69].

Newborn babies are considered very hot in Mexico [68] and among Chinese mothers in Malaysia [211]. Pregnant women are thought hot in India [55] and hot foods which could cause miscarriages are avoided, such as grains and fruits in India [55] and Malaysia [151] and other foods in Latin America [131]. In the puerperium, a woman becomes cold [200] and after each pregnancy can become colder, and especially when menopausal [68]. Therefore measures must be taken to restore body equilibrium and health appropriate to the beliefs in each culture regarding body physiology and the metaphysical status of foods. Such

beliefs vary considerably between countries, and regions of a country and beliefs can only be ascertained through knowledge of the culture obtained from the literature and by observation and discussions with anthropologists, local healers, etc. In this study exposure to thermal or metaphysical heat and cold of foods, etc., was mentioned in, for example, India [17, 130], the Sudan [57], Egypt [1], Barbados [75], Mexico [70, 152] and Peru [57].

Drugs used in the treatment of diarrhoea, be they traditional or modern, also have hot or cold qualities. Some hot modern medicines are nevertheless believed effective in a hot disease; if their heat is neutralized by an appropriate plant infusion [59].

Some authors have commented on the superior protein and calorie content of foods commonly designated as "hot"; e.g. eggs, other animal products, fried foods, etc., as opposed to the much lower values found in some "cold" foods; e.g. vegetables, and fruits, such as watermelons, etc. [137, 143].

Air. The concept of air is also prevalent and a number of diseases are believed to be caused by wind entering the body through all orifices including the umbilicus and skin pores in Malaysia [34], Bangladesh [117], Vietnam (phong or gio) [114] and India (vata) [55]. Some foods are widely believed to carry wind; e.g. cassava, pumpkin, jack fruit in Malaysia [34] and seafood and beef in Vietnam [114]. In Mexico air (el aire) must be differentiated, as in other countries, from "cold" (el frio) which has thermal connotations. For example, air may be present if a light breeze exists. It is not always obviously manifest, but it can carry cold [70].

Both air and cold are thought to cause different diseases. Cold may be acquired by cold substances coming in contact with parts of the body, for example, rain, cold water, a cold floor, cold foods and activities, and will cause such thermal insults to the body as joint pains [68] or diarrhoea [59]. Disease caused by air, such as gastroenteritis in infants, can be prevented by not allowing a cold air current to "grab" the infant. Thus a mother who has bundled up her baby in many clothes may be reluctant to undress him when sick, as in Peru [59].

(iii) Clashing or poisoning.

Other classifications for foods exist such as bisa-bisa (poisonous) food which include fish and some seafood [34]. These and other well accepted foods can become bisa exacerbating an existing disease or precipitating one which is as yet not overt, in Malaysia [151]. Also, opposing foods, lawan and belaga, if eaten together may cause a severe disease with many symptoms which is usually fatal (mabok). Well known combinations to avoid are, for example, Chinese melon and honey, durian and alcohol [151]. In Peru, the concept of clashing foods exist and affects young infants whose delicate status is well known. For example, changing from breast to bottle feeding, or switching formulas causes a clash in the stomach (le choca el niño) [59].

(iv) Neutral and safe.

Other foods have non-specific attributes and are believed to be neutral (often a staple such as rice [200] or temperate such as processed wheat flour in Mexico [152]). They can also be cordial such as the papaya [68]. Foods considered safe have no disease connotation [e.g. nirog in Bangladesh, potatoes and snack foods (habidaybi) [180]. In Guatemala the child may dictate which foods it eats and the mother permit even those which do not conform to concepts of body physiology or the hot/cold food dichotomy [27].

(v) Texture and softness

The organoleptic properties of foods or food preparations - texture, mouth feel, etc. is thought to impart certain characteristics concerning, for example, digestibility. In Bolivia such foods may be classified as astringent or non-astringent [5]. Elsewhere certain foods are thought to be weak, soft or light [152, 200]. Examples are kicheri (rice and dhal) in India [183] or diluted milk and curd [191]. These are commonly thought suitable for children and in convalescence [202]. Other foods are considered strong [200], solid [2], heavy [28], coarse and hot [126] or hard [124]. Among these the range

of foods varies from lentils and beans in Peru [59] to leafy vegetables in Java [79] which are thought too hard to digest by children. Comida pesado in Mexico will include meat, milk, eggs, rice, potatoes [68], eggs, meat, beans, in the Eastern Mediterranean region [172], and in Bahrain also includes fish [160]. Some foods are believed to more nutritious than others with more prestige in Guatemala; e.g. alimentos, chicken, milk, banana, tea, etc., as opposed to comidas which are more easily available and include staple foods; e.g. tortillas, but there is a clear distinction between these groups [43].

(vi) Other classifications

In Mexico, some foods are healthy and others unhealthy (fat) [68]. Wet foods in Ethiopia will include milk and fatty foods, but coffee is dry [2]. Other characteristics include sharp [143], sour [166], salty [28], stale [191], wrong [177], improper [219] and the physical properties of some foods; e.g. their appearance and shape: fuzzy, scaly, pointed, etc. [151].

Mothers will have deeply entrenched views of the suitability or otherwise of various food mixes and preparations for use in diarrhoea. Nutrition education to be effective needs to be based on a knowledge of such views and thus of the local system of food classification and its links with concepts of the body and disease types.

(3) Special observances in pregnancy and lactation

Because a pregnant or lactating mother is thought to be able to transmit illness to the foetus and neonate dietary prohibitions exist during pregnancy and lactation in many cultures. Childbirth is often considered a polluting experience with the mother in a cold state. An injudicious diet in the mother is thought to be able to cause diarrhoea in her newborn. Strict rules regarding maternal diet are commonly observed around the first 40 postnatal days [200]. Such rules are observed in Egypt [92], Niger [173], Tamil Nadu (India) where they are enforced immediately after delivery [55] and Bangladesh for 5 days after parturition [202]. Toda women in Tamil Nadu abstain from bananas and coconuts for one year in order to prevent diarrhoea in the infant. Other foods such as meat, fish, egg, cold fruits such as papaya, mango, pineapple and vegetables such as jackfruit, "very cold" pumpkin, tubers, oil seeds are all believed to cause fits and diarrhoea in the newborn [55]. Thus, in some countries, hot foods will be given to women immediately after delivery. An example is pig's feet and ginger in China [200]. But very hot foods, peanuts, wheat tortillas or avocados are avoided in Mexico as they heat the breast milk [68]. Some workers have suggested that the cautious route to follow in order to minimize such proscriptions is to allow hot foods, followed by foods considered neutral and later cold foods to be added to the diet [131].

Beliefs regarding non-dietary causes of diarrhoea

Traditional societies often believe diarrhoea to be caused singly or in combination by natural causes (including foods consumed), psychosocial factors and supernatural influences. For example, New World black folk medicine divides illness into three causal categories: natural, occult and spiritual [155]. It is important to identify beliefs concerning non-dietary causation as these obviously influence parental judgements and need to be considered when suggesting advice on management in therapy.

In addition to concepts concerning food and illness classifications, a number of other factors are believed to cause diarrhoea in various parts of the world. These usually relate either to the young child itself or to its mother.

(4) Factors affecting young children

(1) Diarrhoea as a Normal Part of Development

This is believed to be so in Kenya [134], Northern Nigeria [60], Malaysia [34], Guatemala [27] and Honduras [14]. However, the characteristics of the stool, colour, consistency, etc., may lead to the perceived diagnosis of the cause, and its classification as a hot or cold disease. Diarrhoea is described as green or white in Egypt [1]. It is thought to reflect changes in developmental milestones in Bolivia [5]. However, reports of yellow,

red and stools containing mucus are also found. Hot and cold classifications vary between countries, the disease is cold in Peru [57], in Egypt (if green or white) [1], hot or cold among Puerto Ricans living in the USA [135], and hot in India [17, 100], Haiti [41] and Mexico (especially red, bloody diarrhoea) [152]. However, the classification may depend on the body physiology of the afflicted individual [152].

(ii) Specific Causes

Teething. In many countries, teething is believed to be a common cause of diarrhoea often resulting in a white and watery stool requiring no treatment. This belief was noted - Ethiopia [2], Kenya [142], the Sudan [57], India [17, 130], Philippines [169, 17], Pakistan [72, 93], Malaysia [34]. North East Brazil [162], Colombia [18], Guatemala (where medicinal plants and unspecified drugs were recommended) [27], Honduras [116], Antigua [113], Belize [199], Jamaica [123, 177], Egypt [1] and Fiji [158]. In a worldwide study, out of 283 questionnaires analyzed, 15% mentioned that incision of the gums or tooth extraction were forms of treatment recommended.

Worms. In an international survey 6% of responses cited worms as an imputed cause of diarrhoea [46]. In the present study worms were reported as being thought to cause diarrhoea in Nigeria [60], India [100], Bolivia (usually pin worms) [5], and Colombia [18]. Such worms were believed to be acquired in uterine life in Antigua [113], Jamaica [123, 177], and Honduras [116]. In the last mentioned, it was also implied that these worms could be transmitted through breast milk. Care in handling the worms' nutritional needs was sometimes felt to be important, as they must live in symbiosis with their host, lest they wandered searching for food or were disturbed by the child's activities (movimientos), such as teething, crawling, etc., which could lead to their migration and lethal "worm fever" [116].

Other causes of worms were believed to be the eating of rice in Jamaica [177], and eggs in Malaysia [196] or eating a side dish (lauk) of foods such as fish, groundnuts, eggs, mature coconuts which would produce ascariasis and would lead to diarrhoea [34]. Among the Tswana in Southern Africa, it was thought diarrhoea in children was caused by an "invisible snake", which must be starved in order for the child to improve.

Pica. This was noted from Nigeria [60], the Sudan [57], Antigua [113], Jamaica [123, 177] and also from Peru where the cause of ingesta was stated to be the swallowing by the infant of "dirtiness" (suciedad) (fruit peels and paper) which remained in situ in the stomach provoking diarrhoea [59].

(iii) Supernatural Causes

Supernatural, ultrahuman and magical influences, such as bewitchment by spirits or possession by demons and witches, are widely thought to cause many diseases, including diarrhoea. For example, in rural Malaysia existing animistic beliefs include 58 types of spirits e.g. hantu, pre-Islamic malevolent spirits, and jin islam, Islamic spirits which may be evil or benevolent [34].

In a world survey, 8% of respondents attributed diarrhoea to spirits or the evil eye [46]. Bewitchment is a cause of green diarrhoea in North India [17], and Kann dristi in Coimbatore, Tamil Nadu [195]. Malevolent thoughts of others can provoke diarrhoea in Nigeria, as can spirit intrusion (sombra) in northeast Brazil [162] and spirits roaming in cemeteries in Bolivia [5]. Evil spirits will affect mothers in Fiji [158] and individuals generally in south Texas, USA [112].

The evil eye is inflicted by envious persons [70], barren women, persons with light coloured eyes [101] or "strong" individuals (e.g. sweaty men and women especially if the latter are pregnant). The names vary - nazar in India [100]; mal de ojo or ojo in Bolivia [5], Chile [184], Guatemala (where it is believed to affect specifically children between the ages of 1 and 5 years) [27] Honduras (children under 1 year) [116], Mexico [68, 152] Peru [59, 184]; guebranto in northeast Brazil [162]; (maljoc, oeil du diable in Haiti [103]; and overlooking, Jamaica [99].

(iv) Culturally Defined Illness

Folk diseases exist among which the most commonly known are the following:

Empacho. Empacho affects both adults and children and is believed to be caused by intestinal blockage due to a surfeit of food [68, 69, 152], to eating wrong foods (hot or cold), when the body is itself either hot or cold, to eating at the wrong time, to missing a meal (in Honduras) [116], or to dietary indiscretions, such as introducing beans too early in the child's diet (in Guatemala) [27]. It is a well recognized cause of diarrhoea [116]. Empacho is frequently believed to be cold, in Mexico [69] and Guatemala. In coastal Peru and Guatemala, empacho is believed to be mainly a child's disease caused by ingestion of unripe, half cooked fruit, soft bread which becomes impacted in the stomach or intestinal canal [184]. Hot herbal remedies and medications are given both in Guatemala and Mexico [152]. However, Puerto Rican residents in the USA may treat it with both hot and cold foods [135]. In rural areas of Honduras, a special diet is given comprising meat, chicken, beef, pork and sometimes milk or eggs but no beans.

Susto. Certain diseases prevalent in Latin American countries have an emotional component, such as susto, which is due to fright. It is reported from northeast Brazil [162], and Guatemala is stated not to affect children between the ages of 1 to 5 years [27]. When susto is a hot disease, cow's milk is given to treat loose stools. When, however, susto is cold, the diet includes goat milk, eggs, meat, beans and herbal teas (hierbas). In Oaxaca, in Mexico, similar hot/cold therapies are used [152]. The diarrhoea is foamy and white causing anorexia and at times it may be bloody [42]. In Peru, susto may affect the lactating mother and transmit diarrhoea to her infant [59]. Other emotions; such as anger (courage), envy (envidia) and sadness, may precipitate bilis (aroused bile, which overflows into the circulation causing the blood to boil); these emotions can be transmitted through breast milk to the child causing diarrhoea or dysentery (in Mexico [66], Guatemala [27], and in Peru [59]). In Mexico, suitable herbal remedies are given to the mother [152].

Intestinal heat. Is also a well recognized entity in northeast Brazil [162] (quinturo do intestino).

El cancer. Pregnant women exposed to the dangerous special heat which radiates from a corpse are likely to become ill, abstention from bathing closes body pores and prevent heat from el cancer invading the women [70].

Soreness or wounds of the stomach (ilaga) (with or without bleeding). This is also considered to cause diarrhoea in Peru [59]. In Honduras empacho is thought to arise when the gut is wounded because of indigestion or the intestine is dirty. It has to be treated with appropriate foods or medication depending on whether the illness is hot or cold. [116].

Caida de la mollera (fallen fontanelle). This is not dependent on the hot/cold dichotomy, but on the idea of balance in restoring the equilibrium by filling the sunken space. It may be thought to be due to parental neglect. In some areas; e.g. Honduras [116], it is thought that a fall may precipitate caida, and thus diarrhoea. Caida has been reported from Mexico [68, 152] and from Honduras [116], in USA (south Texas) [112]. Treatments vary - filling the space with leaves, holding the child upside down and slapping the soles of the feet, etc. [116].

(5) Non-Dietary Causes

Contamination of a child's clothes before they are worn is sometimes thought to cause diarrhoea. For example, if garments are left out in the cold all night (Peru) [59] or are touched by strangers (Uganda) [16]. Vestments dried in the open may be contaminated by the shadow of a bird or by its droppings, and either of these may cast a sin on the child (pakshi dosham) in south India [128]. Clothes are also dangerous for the child if they have been exposed to dark places or emanations from cemeteries in Bolivia [5]. Various treatments exist to deal with such circumstances.

Pollution in the sense of impurity was also mentioned from Peru [59] and among the Hausa in Nigeria. "God's will" was also mentioned by this group and stressed by 2% of the respondents in a world survey [46].

(i) Factors affecting Mothers

The mother's physiological or physical condition may be believed to cause diarrhoea in the breastfed infant. For example, lactating women who have resumed intercourse, are menstruating, have become pregnant [46], or themselves have fever or loose stools (Peru) [59]. The mother's body temperature may also be thought to be relevant - for example, if chilled in a rain shower or following the drinking of cold water or after hot agricultural work [152].

In some areas, it seems that the risk is considered greater for the nursling if the mother eats certain foods in the first forty days after delivery. This is often a special culturally defined period for seclusion or a special diet, either restricted or increased.

Examples of a number of maternal activities thought to cause diarrhoea in the offspring are: engaging in cold activities, washing clothes (even if hot water is used) in Peru [59]. Other occupations undertaken in the sun or shade may be thought to affect bodily humoral balance in the mother. For example, agricultural pursuits are heating whilst weaving indoors is a cold pursuit in Mexico [152].

Other activities include the mother crossing past a water tank in India and not washing her breasts on arrival home [17]; if a pregnant Hopi Indian mother carries her child, diarrhoea will ensue because of her bad breath [140]. A careless mother who does not try to stop the diarrhoea (sin cortar) is recognized as causative in Peru [59].

(ii) Physical Condition

Maternal health status can cause diarrhoea in her infant and her child because of ill health or transmission of disease via breast milk. For example, if the mother or the child has a fever, the milk may turn to "vinegar" in the Philippines [80]. Other circumstances include breastfeeding under different climatic situations; e.g. a mother takes a cold shower or is caught in the rain and drinks a cold fluid in the Philippines [80], the mother's breast milk is heated by the sun in India [17] and Barbados [167], using breast milk which has remained in her breast for over six hours and is not discarded in the Philippines [80].

(iii) Psychosocial

These are very complex and often culture-specific. For example, diarrhoea is thought to be caused by breastfeeding during menstruation and resuming sexual intercourse during the nursing period in some cultures [46], parental sexual infidelity in parts of Africa [46], touching and looking at a child without taking the "prescribed" precautions after an adulterous act among the Baganda, or a man other than the father mending the roof [16], maternal misconduct in India [17].

(6) Non-Dietary Prevention or Treatment

The treatment of diarrhoea anywhere consists of more than one measure. Non-dietary procedures may be divided into alimentary (e.g. other measures than the diet affecting the intestinal tract and stomach) and non-alimentary.

(i) Alimentary Prevention or Treatment

Preventive purgation is sometimes started at birth. It may be administered every second day till the age of 18 months in parts of India [176] or twice a week [26]. Expensive olive oil or cooking oils may be given to the neonate 2 or 3 days after birth to ward off diarrhoea in Guatemala [27] and administered in a variety of types of diarrhoea in Bolivia [23], to treat empacho in Honduras [116] and among Mexican Americans in the USA [51]. Oils are also given to drive out heat in newborn babies in Malaysia [211] and in preparation for further drastic treatments given to children among the Tswana of Southern Africa [85].

In India arsenic and belladonna are given for severe attacks of diarrhoea and pulsatilla and camomile tea for green stools. The use of opium was noted in several reports [17, 130, 183], as well as mercury given for bloody stools both in India [183] and among Mexican Americans in the USA [71], and atropine in Peru [59].

Castor oil is given in Swaziland [53], India [195], and Guatemala [27], senna, bismuth, "worm" medicines in Guatemala [165], Jamaica [123], Barbados [78], Nicaragua [144] and Antigua [113]. Local pastes containing asafoetida, curry leaves and sundry ingredients are given in India [9] and mashed corn, chili and castor oil in Guatemala [27]. A solid stick made of rice is given to children to suck on in Central Java [211] and a brew made from powdered wasp nests in Namibia [136].

Enemata. The use of enemas given using reeds, has been reported from several parts of Africa [53]. Among the Bapedi in Sekhukuniland, these may be introduced from birth onwards. In Kenya, a special enema is devised to kill "insects" seen around the child's anus (possibly pinworms). The child sits in a basin containing the urine of a black sheep with the addition of powdered anyong. Other children with reeds blow into the mixture, so that it will wash off the offending "insects"; if this does not succeed they will administer the fluid as an enema through hollow reeds [44].

Plant Infusions. A great deal of information was received on this subject, through articles, personal communications and bibliographies [60, 156]. Over 150 substances were named from all world regions. A few were recommended as dietary constituents; e.g. leaves or macerated fruits added to soups or as appetizers for anorexic individuals [60]. These concoctions were derived from all parts of plants or trees, for example, blossoms, fruits, leaves, berries, seeds, bark and resin, as well as numerous wild plants. These infusions, bush teas, tisanes, aguitas, etc., appeared to be given for medicinal purposes in all types of diarrhoea, although some were specifically used in dysentery; e.g. bisana seeds (Glinus lotoides) or as anthelmintics if the presence of parasites was suspected; e.g. fanfa leaves (Pychnostachys sp.) used as an ascaricide and taeniocide in Ethiopia [125] or Chenopodium ambrosioides in Haiti [41]. A list of countries where plant infusions are used is given in Annex C.

The toxicological effect of many of these plants is as yet not fully known. Many are described as having astringent qualities because of their high tannin content. Among native American groups it has been noted that a disproportionate number of species belong to the Rosaceae family [156]. However, if these plant infusions are harmless and even beneficial they provide at least a source of boiled water in diarrhoea and as such are a culturally acceptable source of fluid and/or a vehicle for added electrolytes (ORS) required for oral rehydration therapy.

Miscellaneous

Charcoal, obtained from a variety of sources was used in five countries. Burnt toast in South Africa [149, India [183] and Peru [59], the ashes from the charred bark of a fir tree among the Kwakiutl Indians of Canada [22] and ashes of burnt white silk in Iran [88].

Gripe water, appeared to be given to infants often with a "teething" diarrhoea in the West Indies (e.g. Barbados, at repeated intervals [78]) and in India [19]. It may be an import from Britain in the past.

Galactogogues are believed to increase breast milk secretion and possibly the quality of the milk. These beliefs may be based on "sympathetic magic"; e.g. wearing a vine around the woman's neck which secretes a white sap or drinking a fluid the colour of milk, however some concepts may be based on scientific principles [33]. Two main types exist.

Plant infusions may be used as galactogogues. In Egypt, caraway infusion was recommended before starting to breastfeed [91]. Reports of plants used in galactogogues can be found in early Ayurvedic literature in India and some are still used. Research using experimental animals has been undertaken on the following species: Abroma augusta, Asparagus racemosus, Cuminum cyminum, Galog, Leptaden, Leptadenia reticulata and Nigella

sativa [33]. Two preparations which are marketed in India are recommended by traditional practitioners. These are Galog, a mixture of a number of plants, and Leptaden (containing Leptadenia reticulata and Breynia portens). In Indonesia, jamus are widely available, made from herbal preparations and are also commercially marketed [146] and in Fiji hibiscus tea is recommended [158]. In Ethiopia, the application of the powder from partially incinerated dechmarech wood to the breast is believed to promote lactation [125].

Various items in the diet may be recommended: fruit juices, fish, wheat flour, corn meal, porridge and other cereals and milk were noted in Barbados [167] or cow's milk and green kalumba leaves in the Philippines [169], or green vegetables with or without molasses or halawa in Egypt [91].

(ii) Non-Alimentary Prevention and Treatment

Diagnostic techniques. Those must be initiated prior to taking action against diarrhoea. Examples are:

Divination. A whole egg is passed over the child's body, then broken into a dish of water and a cross made of ruda leaves is placed over it. After reading the test, a diagnosis of empacho, evil eye, etc., can be made and treatment given accordingly, [Honduras [116]].

Testing milk. Breast milk is expressed in a saucer; if no flies settle on it, the milk is declared unfit for use, Fiji [158].

Avoidances. A wide range of magical techniques are used to prevent diarrhoea. For example, in Honduras keeping out of the wind and rain avoids empacho and tying a red cord around a child's wrist or dressing in red avoids the evil eye and wearing red underwear protects the foetus [116].

The evil eye is avoided in Ethiopia by burning a specific root (temenai securidala-Longi penduculate) in the house and inhaling its smoke or by hanging a fruit (kel-Lagenaria sp.) over the doorway [125]. In the Philippines, heavy copper bangles will remove heat and the evil eye and rubbing a neonate's lips with powdered charred chicken gizzard is thought to protect against diarrhoea [80].

Remove the cause. Among the Tswana in Southern Africa, diarrhoea is believed to be caused by a large snake that must be killed. The child is given emetics and purgative herbal infusions. Its ears, nose and rectum are blocked with vaseline for three days. It is feared that if the child is taken to hospital he or she may be fed and the worm will revive, prolonging the diarrhoea [85].

Fumigation. In parts of the Sudan, particularly rural areas, women commonly cover themselves with a woollen mat and expose themselves to the smoke of a special wood which is burned within the house. The result is thought to improve skin texture. If the child has diarrhoea, the fire is extinguished, and the child placed on the mother's legs and covered by the mat for 5 or 10 minutes [57].

Inunction. This is commonly practised. The patient is sprayed with cane liquor which is rubbed in using ruda leaves in Honduras [116]. The abdomen is inuncted with lizard or shad tea in Jamaica [123], the child's abdomen is rubbed with its own urine in Peru, and a restricting band (ombliguera) is placed around this area [59]. The chewed root of the plant Wedela biflora is used for inunction in the Solomon Islands [21]. Massage treats empacho in Honduras [116] and is administered in India using different preparations [183]. Among Mexican American families living in Texas, USA, as well as abdominal massage, the child's clothes will be changed if diarrhoea is caused by a ghost.

Baths. These may be given in diarrhoea or to prevent it. For example, in Buganda if a parent has committed adultery, the child should be bathed [16]. Baths are also given in Bolivia using tola herbs [5] and in Hungary, the patient sits in a fragrant bath which contains carnation petals and the blossoms of trees [15].

Counter irritants. Leeches are applied to the abdomen in diarrhoea in the Philippines [80].

Incantations, magical chants, dances, etc. These rituals have been reported from Bolivia [5]. In Mexico individuals may be taken to local curers and incantations will be made to remove the disease and medications given [152]. Exorcism may be used for some mothers whose children have green diarrhoea in India [17]. When a child has accidentally acquired a sin (doshan), which causes diarrhoea, magic formulas will be used (manthem) in the Chingleput district of Tamil Nadu [128].

IV CONCLUSIONS

The major conclusion of this review is that information on traditional dietary management of diarrhoea is very incomplete and there is an important need to collect more information in the field in a more systematic way than has generally been the case. Nevertheless, despite the many inconsistencies, general conclusions can be suggested as a basis for further analysis.

(1) Comparisons

Despite the great variation in detail from area to area and between reports, two types of comparison can be attempted: (i) between traditional cultures, and (ii) with western-style technical medical culture.

(i) Comparison between traditional cultures

Limitations in cross-cultural comparisons of traditional practises concerning feeding during and after diarrhoea include the following:

1. Variation in available foods, customary dietary patterns and economic levels. For example, only a minority of the world's population habitually drink milk; expensive animal products, such as meat or fish are usually extremely limited in the diet of most families in developing countries, especially for young children; a wide variety of different vegetables and fruits may be considered as causative, or to be avoided or recommended in diarrhoea.

2. Considerable diversity within cultures, between families, economic levels and other sub-groups such as castes in India.

Nevertheless patterns can be discerned.

Diarrhoea is believed to be due to various dietary or non-dietary causes singly or together. Indeed, special traditionally defined types of diarrhoea are often considered to have specific cultural causes. Certain foods or food types are commonly considered to cause diarrhoea (Table: 1). In traditional management, a period of starvation was mentioned in twenty-three statements, mainly with special mention of young children. However, the length of this period was rarely stated, and it seems likely that starvation or severe food restriction is more common than was indicated. In feeding during and after diarrhoea, certain foods and food types were frequently noted as being avoided or recommended (Table: 1).

Breastfeeding may be continued in young children, or may be limited or sometimes stopped for a time. However, in most reports, information was not given specifically concerning breastfeeding.

Most often, the first food offered appears to be a dilute or less concentrated, soft preparation of the local staple. Plant infusions were frequently mentioned, but are not considered here primarily as foods, but as medicines. The second most common group of foods mentioned were certain types of vegetables or fruits, notably carrots and apples. Animal milk, either undiluted or diluted or fermented, was mentioned third most commonly, but this usage only applies to regions where the milk of cow, buffalo, goat, etc., are traditionally affordable and consumed. The next most commonly mentioned were: fluids, then animal products, followed by legumes and oil seeds, and oils and fats (Table: 1).

TABLE: 1

COMMON TRADITIONAL FOOD PRACTICES AND DIARRHOEA

<u>Believed to Cause Diarrhoea & /or Avoided</u>	<u>Recommended in Diarrhoea</u>
Animal products, especially eggs	"Less concentrated" staple preparation
Certain types of fatty, spicy, etc. food preparations	Certain vegetables and fruits
Certain fruits and vegetables	Animal milks, including fermented milk preparations
Legumes and oil seeds	Water with sugar, honey or as an infusion
"Thick" staple preparation	Animal products, especially fish
Undiluted animal milk	Legumes and oil seeds Oils and fats

(ii) Comparison with western-style medical culture.

The general approach to the dietary management of diarrhoea advocated by western-style medical culture until recently resembles in many ways the pattern just outlined for traditional cultures. Indeed, until the past few years, western-style medical management of diarrhoea, especially regarding the diet, was based more on cultural assumptions and practices than on scientific investigation. This has often not been realized by either health workers or patients and has inhibited a scientific approach to management of infantile diarrhoeas.

(2) Needs

To bridge traditional and medical approaches and dovetail them together in the dietary management of diarrhoea, there are three main needs: (i) to recognize modern metabolic insights; (ii) to recognize the significance of traditional practices; and (iii) to obtain further information.

(i) Recognition of modern metabolic insights. This has two aspects:

(a) Digestion and absorption is greater than previously recognized

Modern knowledge concerning the pathophysiology of acute, usually infective, diarrhoea, of young children has demonstrated the much greater absorption of water, electrolytes and other nutrients from the intestine during and following acute diarrhoea than was previously believed possible. It indicates that foods should be reintroduced early in diarrhoea and that breastfeeding should be continued throughout an attack. In this way, the severity of an attack and its nutritional consequences can be minimized.

(b) Increasing water and electrolyte absorption is the priority emergency treatment

The initial emergency need in acute diarrhoea in young children is to prevent or correct potentially fatal dehydration. Methods of dealing with dehydration rapidly and effectively have been radically altered by the demonstration that glucose in the intestine can facilitate the absorption of water and electrolytes. This is the basis for oral rehydration therapy (ORT) which in recent years, has spread widely throughout the world and has revolutionized the management of diarrhoea. This has been principally based on the use of pre-prepared packets of oral rehydration salts (ORS). Details concerning ORT and composition of ORS recommended by WHO are available [216, 217]. Modifications of the basic packet formula are also under study.

ORT has also begun to be used selectively in some technically more developed countries for less severely affected children. However, in such countries, it is still often current practice to restrict foods markedly or to withhold them for 24-48 hours, and to give major emphasis to intravenous rehydration. Reasons for this inappropriate practice include persistence of deeply rooted technical medical traditions (e.g. "resting the bowel", etc.), insufficient awareness of modern research on intestinal absorption in diarrhoea, and lesser concern with dietary restriction in well-nourished children.

ORS is not needed for prevention of dehydration. Instead, a variety of home remedies can be employed [216, 217]. These fall into two groups:

- (b) Salt and sugar solutions. These are made of white household sugar (sucrose) and cooking salt (sodium chloride). In a few countries, molasses or unrefined sugar is used in place of white sugar. More than twenty different recipes have so far been suggested for these solutions. Methods for their preparation include hand measures (e.g. "pinch and scoop"), household spoons, and specially manufactured double-ended plastic measuring spoons, as well as local bottles or other containers for measuring volume. Each of these methods has advantages and disadvantages, centering around the availability of appropriate utensils and their use, the availability and affordability of sugar and salt, costs and seasonal shortages, and varying quality and forms of sugar or salt.
- (a) "Household food" solutions. These are fluids or liquids that are normally available in the home and are appropriate for the early treatment of acute diarrhoea. Such solutions are often prepared by boiling, thus improving safety for drinking. They contain sodium from cooking salt (and sometimes small amounts of potassium) and starches and protein as sources of glucose and amino-acids, which help with the absorption of sodium and water from the intestines. Two examples are rice water or gruel, often found in homes in Asia and elsewhere, and various soups, including carrot soup, sometimes available in households in North Africa. In all of these, variable amounts of salt are usually added during cooking.

These home remedies may lack sufficient amounts of some of the ingredients in ORS and, therefore, are not recommended for the treatment of dehydration. They may also be very low in nutrients and provide an "incomplete" diet. Nevertheless, they can be used at the onset of diarrhoea to prevent dehydration and may need to be used for rehydration in situations where ORS packets are not available.

(ii) Recognition of significance of traditional dietary practices in diarrhoea

The increasing awareness of the scientific feasibility and nutritional desirability of early feeding in diarrhoea needs to be paralleled by increased awareness of the significance of traditional practices in the particular culture. This does not often happen. Medical training, in particular, usually contains little or no emphasis on cultural variation. This major deficiency in many medical and nursing curricula urgently needs to change. In fact, some traditional practices in feeding in diarrhoea have been more metabolically appropriate than dietary practices advised (until recently) in orthodox western medicine. The traditional use of rice and carrot preparations may be quoted.

The objectives of dietary management should be the same anywhere. However, detailed knowledge of indigenous practices offers the best basis for successful methods adapted to the local culture, which are most likely to be followed. For example, the feasibility of using culturally approved, non-harmful, dilute plant infusions (e.g. lime leaf tea) needs consideration as a method of ensuring boiled water to increase fluid intake. The use of non-harmful galactogogues may be advised to assist in increasing the mother's confidence and hence milk production. Galactogogues are traditional herbals, foods or procedures which are considered to increase the amount of milk produced, possibly or most usually on a psychological basis, but in some cases with possible pharmacological effects.

Where animal milk is a common food item, there is often a cultural preference for fermented milk products, such as yoghurt, in diarrhoea. This should be encouraged as being both culturally acceptable and physiologically appropriate. Such foods supply calories, protein, vitamin A and other nutrients. Lactose which may be difficult to digest in acute diarrhoea is much less in fermented products than in untreated milk.

The withdrawal of other foods than breast milk and the staple in diarrhoea and the sequence in which they are reintroduced during recovery and convalescence depends on availability and cultural attitudes. Mixtures traditionally preferred following diarrhoea (e.g. rice and pounded fish) are often very suitable and to be encouraged. Flexibility and local adaptation are needed. However, the ultimate objective should be continued breastfeeding and combined feeding with a nutritionally optimal weaning multimix [111] that is energy dense. All appropriate available foods which can be afforded and fit into local cultural beliefs and culinary practices should be used.

A summary of present views concerning the dietary management of diarrhoea in young children is given elsewhere [107] according to the "stage" of the diarrhoea and with some comments on traditional influences.

(iii) Need for further investigation.

It is apparent from the present review that detailed information is needed concerning cultural attitudes and traditional practices in feeding during and after diarrhoea. Very little fieldwork has been undertaken specifically with this in mind.

Such studies should investigate traditional practices during diarrhoea, with attention to any changes in such practises caused by dehydration or its recovery, and in convalescence. It should include young children in the first two years of life subdivided into the following categories: young infants less than 4 to 6 months of age on an exclusively (or predominantly) milk diet, preferably breast-fed, and older infants and young children on a milk diet and or semi-solid weaning diet.

Major issues include the following:

- a) investigation of cultural attitudes towards feeding during and after diarrhoea and actual practices by inter-disciplinary teams, employing anthropological techniques, such as participant observation, rather than relying only on recall information obtained by questionnaire;
- b) elucidation and testing the channels of communication in different communities and the best methods of incorporating new ideas concerning hydration and feeding in acute diarrhoea in young children in different cultural circumstances and testing their effectiveness;
- c) nutritional, metabolic, microbiological and clinical investigations of the effectiveness of traditional feeding practices in diarrhoea, including the use of cereal grain and non-cereal grain staple preparations, and the most culturally appropriate and nutritionally beneficial additions to the diet during recovery and convalescence.

ANNEXES

ANNEX A: DIETARY PRACTICES: DETAILS

A.1. Foods Believed to Cause Diarrhoea

Staple Foods:

- a) Cereal grains. These include rice in Pakistan [38, 203], glutinous rice in Taiwan [219], rice in Colombia [28] and Jamaica [believed to cause worms; hence, diarrhoea] [29, 177]; maize porridge in Kenya [142] and in Haiti [41]; soft wheat bread in Peru [59] and Guatemala [27], noodles in Guatemala [27], and new wheat in India [130].
- b) Non-cereal staples. These include potatoes in Bolivia [5], Guatemala [27] and Mexico [152]; sweet potatoes in Taiwan [222] and Kenya [164]; cassava in Bolivia [5].

Animal products:

- a) Human milk. Colostrum was rejected because it was believed to be only water or that it could cause diarrhoea in Guinea Bissau [96, 178]. Also milk which was stated to change to yellow or orange in one or both breasts was believed to be due to the evil eye and poisonous in Fiji [158]. Transitional or mature milk was not given in Niger [173] and North-Eastern Sudan [57]. In the latter country, this applied specifically to milk given by a pregnant woman. Other causes included irregular or too frequent nursing in Haiti [41], breast-feeding in general in the Philippines [72] and in India [17] and when given in insufficient amounts in Tamil Nadu [9]. The belief also existed that maternal diarrhoea could be transmitted via breast milk in Peru [59], dietary indiscretions could affect the milk in American Samoa [58] rendering the milk "bad" and the breast milk of some mothers was inherently "noxious" in Antigua [113].
- b) Animal Milks. These included canned milk in the Sudan, (especially during pregnancy) [166], in Ethiopia [2], India [17], Bolivia [5], Honduras [116], Colombia [18], and Guatemala [27]; and cow's milk in Haiti [41] and Mexico [26]. Animal milks taken with other foods [cucumber, watermelon] in Hungary [14], eaten with sour fruits in the Philippines [169]. Skim milk was believed to cause diarrhoea in some families in Barbados [167] and in Guatemala [27], and Niger [35] (some of this milk was distributed as food aid), and changing the brands of formula used was reported to be responsible in Peru [59]. Cheese, however, was only mentioned once as a cause of diarrhoea, in Peru [5].
- c) Meat. As a general rule, meat was believed to cause diarrhoea in the majority of Eastern Mediterranean countries [172] and was specifically mentioned in Bahrain [153] also, and in one country in the South Pacific, e.g. Kiribati [45]. Varieties were not specified in some countries, including Nigeria [97]. Meat was thought responsible if eaten during pregnancy in the Sudan [166], in Haiti [41] and American Samoa [58]. In Bahrain [160] it was believed to be "hard" to digest. Beef and beef broth were believed to cause diarrhoea in Honduras [116], Mexico [152], as did pork in Guatemala [27], Honduras [116], Bolivia [5], Puerto Ricans in the USA [135], and American Samoa [58], and lamb in Bolivia [5]. Chicken meat was implicated if eaten in pregnancy in the Sudan [166], as was fish. Fish was also mentioned in Honduras [116], Peru [207], Puerto Ricans in the USA [135], American Samoa [58]. Crab meat eaten with persimmon (*Diospyros kaki*) was not advocated in Taiwan [219].
- d) Egg. Egg consumption was reported as being thought to cause diarrhoea in Nigeria [97], Philippines [80], India [183], Nepal (until all teeth had erupted) [77], Guatemala [27], Haiti [41], Honduras [116], Bolivia [5], Peru [207], the USA among Californian Mexican migrants [112], the Chinese population in England [209].

Legumes and Oil Seeds

These mainly included beans; e.g. in Benin [74], in Kenya [89], India [211]; (bean sauce) in Haiti [41], Barbados [167], Guatemala [27]; thin black beans in Mexico [152]. Peas were implicated in Bolivia [5]. Consumption of legumes was not advisable in some Eastern Mediterranean countries [172] nor dhal in Pakistan [38]. Groundnuts were not eaten in Taiwan [219] nor in Kenya, where the use of simsim (sesame) (Sesamum indicum) was also avoided [89] and nuts generally in Bahrain [153].

Vegetables

Some were believed to cause diarrhoea. The species were not identified in a number of countries: Kenya [164], the Sudan (during pregnancy) [166], Vietnam [145], Malaysia [143], (especially if overconsumption occurred), and Thailand [10]. Most of the vegetables which were identified belonged to yellow/orange/green species; e.g. squashes, pumpkins, etc. in Taiwan [219], Guatemala [27], Mexico [152], green leaves in Vietnam [145], lettuce and green peas in Bolivia [5]; other vegetables included cucumbers in Malaysia [35], India [130], and if eaten with milk in Hungary [20], avocados in Guatemala [27], Mexico [152], and especially if eaten with chocolate (i.e. two heating foods) in Bolivia [5], jack fruit in India (lactating women) [9]. In the Eastern Mediterranean region, such vegetables were believed to cause loose stools [172], as did both onion and garlic in Hungary [20].

Fruits

Some fruits were avoided among certain groups, such as infants in the Philippines [169] and pregnant women, Sudan [166]. Green, unripe fruits were implicated in Nigeria [97], Peru and Chile [184], and melons in Taiwan [219] and India [130]. Some fruits were specifically mentioned; e.g. soft dates in Sudan [57], the Kogha fruit (*Ficus* sp.) in Papua New Guinea among the Chimbu [210], pineapples and mangoes in Malaysia [34, 143], the latter being believed to cause diarrhoea and fits in lactating women in India [9], papaya in Thailand [10], and bananas in Malaysia [143] and Pakistan [203]. Citrus fruits were also implicated in Malaysia [34, 143] and Bolivia [5]. Both excessive consumption of fruits; e.g. plums, pears, cherries, grapes in Bulgaria [20] and eating partially rotten fruit in the Cook Islands and Western Samoa [56] were deemed undesirable practices.

Miscellaneous Food Items

Excessive consumption of foods generally was implicated in Uganda [16], China [219], India [130], Honduras [116]. More specifically, the following items were mentioned from different parts of the world; honey and jaggery [village-prepared sugar] given to newborn babies in Gujerat, India [132] and in Mexico for all age groups [70]; sweets generally in Jamaica [177]; cassava bread among the Black Caribs of Guatemala [184], fenugreek seeds in Ethiopia [83], and vinegar in Malaysia [143].

Food Preparation

Results in this area correlated well with certain cooking methods which were avoided. Heading the list were greasy foods in Ethiopia [2], Haiti [41], Guatemala [27], Hungary [14], American Samoa [58], Solomon Islands [21], and Bahrain [153]; spicy foods in India [130], Malaysia [143], Peru, especially if oregano was used [59], Bahrain [153], and in Sudan, especially in pregnancy [166]; fermented food, sorghum in Sudan [57], vegetables in Thailand [10]; salty foods in the Sudan (during pregnancy) [166], Thailand [10], Colombia [18], sharp foods, Malaysia [143] e.g. pineapple, limes, vinegar, etc., sour foods in the Sudan (in pregnancy) [166], Thailand [10], heavy foods in Honduras [116], starchy foods and broths in Guatemala [27], Barbados [167] and liquid foods, Thailand [10] and India [130]; insufficiently cooked foods in the Sudan [57] and Peru and Chile [184]; wrong contaminated or spoiled foods in Jamaica [177], Colombia [18], Cook Islands, Western Samoa [56], American Samoa [58] and Pakistan [118]; stale foods, Barbados [167], Jamaica [171]; improper foods, not well prepared, in China [219] and eating at the wrong time in Colombia [18].

A.2. Foods Avoided During Diarrhoea

Staple Foods

- a) Cereal grain staples. The stage of maturity of the grain was sometimes taken into consideration; e.g. grains of new crops should be avoided in India [184, 191], also the use of old rice in the Coimbatore area [49]. Cereal gruels, which were recommended in most countries, were believed to be unsuitable in Ethiopia [7]. In Bulgaria, all cereals were avoided, except rice [129], as were wheat, corn, and rice in Northeast Brazil [162]. There also was a decreased use of all cereal staples in Bangladesh [202]. Rice, the common staple in most Asian countries was not given in some areas, e.g. in parts of India [183]. In Coimbatore, India, the combination of rice and dhal was not given [49] and in Bangladesh [202] barley was a common substitute. In Pakistan [38, 93] and in Mainland China (glutinous rice) [219], this staple was avoided, and rice water was described in Thailand by some as "dog or pig food" [10]. Thick rice gruels were not given in Tanzania [124]. The same avoidance of the staple food occurred in some maize-eating countries; e.g. South Africa [149], Haiti (mais moulu) [103], Guatemala (tortillas) [27], as well as among Mexican Americans in the USA [51]. Wheat porridges and other commodities such as biscuits, etc., were not used in diarrhoea in Tanzania [124], in Pakistan (chappatis, biscuits) [141, 93], in Bangladesh, pitha bread [180]. Millet was not used in Mainland China [220] not in Tanzania [124], and boiled sorghum was avoided in the Sudan [57].
- b) Non-cereal staples. Some of these were not given; e.g. potatoes in Pakistan [141], in South India [192] and Guatemala [27], sweet potatoes in Kenya [164] and Taiwan [219]. Some starchy gruels made from the following foods were avoided: lotus root and yams, mainland China and Taiwan [219], yams in Bangladesh [119], cassava in Colombia [28], and among the Black Caribs of Guatemala (areba bread) [187].

Human Milk

Data on this subject was not easy to categorize and depended on a number of factors, such as variations in maternal practices, methods of reporting by authors, the possibility of breast milk not being considered as a food, and variations between urban and rural areas in some countries. Usually in urban areas formulas were used more frequently and these were often diluted or stopped, as in Haiti [41]. Some authors reported the children were "starved"; e.g. in South Africa among the Tswana, because of cultural beliefs about disease causation [85]; also in the Sudan [158] and Ethiopia [7] and in Niger (during maternal illness) [173]. In Asia, stopping feeding during diarrhoea appeared to be common; e.g. Sri Lanka [189]; Vietnam during maternal illness [145]; China (during acute phase) [222]; India in the northern area (stopped or reduced) [32]; as in Bengal [32] and other areas [130]; in Coimbatore, India, infants were starved [49] and also in Pune in the same country [19]; in Burma (in early stages of diarrhoea) [52]; in the Philippines, infants were starved for 48 hours or longer, prior to introducing rice water [52]. In Nepal, children are traditionally starved during diarrhoeal episodes [9] as occurs in other countries, for example, Egypt (in formula fed infants) [1], in Syria (both bottle and breast-fed) [40], in the Americas, Bolivia [23], Peru [59], Belize [199], Guatemala [27], Nicaragua [144], Barbados [177], in Haiti [103], Trinidad [25, 108], also in Fiji (during maternal illness, but it was customary to find a surrogate mother) [158].

Other Animal Milks

Milks of various kinds were often avoided in diarrhoea, e.g. in Guinea Bissau [178] and Ethiopia [20], or diluted with tea [7]; fresh milk in Somalia [95], camel and sheep's milk in Sudan [57]; many parts of India buffalo milk [192] and other milks [13, 19, 50, 121, 183] and lactating women abstained from eating curds [9]. Milk was also not used in parts of Pakistan [93, 119, 141, 200]. Avoidance was noted in the Americas - for example, in Peru (especially if eaten with sour fruits) [59, 202], Colombia [28], Guatemala [65, 202], in Mexico [26] and among Mexican Americans in the USA [112]. Milk was also avoided in Tunisia and Jordan [202], and, in Europe, in Bulgaria [129], Iceland [186] and Norway [66]. Powdered milk products were not used in Peru [59] and donated milks, dried skimmed milks (DSM) and corn soy milk (CSM) preparations were believed to cause diarrhoea and thus were avoided in Guatemala [27].

Meat

Animal meat was generally not eaten in diarrhoea and sometimes certain species were not given. Such proscriptions existed in parts of Africa, for example, in Guinea Bissau [96, 148], Nigeria [97], the Sudan [158] and in Madagascar (for children [148]). In Asian countries, meat was discontinued or avoided. In Bangladesh, beef, goat, lamb and chicken, when given, was decreased in quantity [93, 202, 180]. Meat generally also was not fed in Pakistan [158], in Korea [133] and in South India [192]. Avoidance of meat was also practised in Guatemala with special regard to beef broth and pork [12, 27, 116]. In Honduras, meat was avoided in general including chicken and pork [116]. This was also the case with Puerto Ricans (residing in the USA) [135] and in Jordan [165].

Eggs

Abstention from eggs was a common practice in diarrhoea in most regions of the world - Africa: in Nigeria [97] and Tanzania [124], Asia: Bangladesh (stop or reduce) [119, 180], in India [183], Korea [133], Malaysia [196] (as they are believed to cause worms, hence diarrhoea) [196], Pakistan: (stop or reduce) [141, 117], and in the Philippines [82]. Eggs were also avoided in parts of the Americas, Colombia [28], Peru in the rural areas [202], Haiti [103], Guatemala [12, 27]. Consumption was stated to be stopped in Bahrain [160, 166].

Fish and Seafood

Fish was avoided in Guinea Bissau [148] and Mozambique [148]; also in India [55] and South India [192], in Thailand [10], Bangladesh (except for a species of catfish) [180]. In Guatemala, among the Black Caribs, fish was avoided especially for infants [187], as well as in Honduras [116] and in rural areas of Peru for all age groups [202]. In other countries, fish was also not given, in the Gilbert Islands [45], Bahrain [172] and among Chinese residents in England [193]. Seafood was generally not eaten in Taiwan and crabs were specifically avoided especially if eaten with persimmon (*Diospyros Kaki*) in Taiwan [219] and in China [219] and by Chinese living in the United Kingdom [193].

Pulses

Responses were received from the following countries: in Africa, beans were avoided in Nigeria [97, 148], Tanzania [124] and Guinea Bissau [148]; in Ethiopia fenugreek (*abish* mixed with butter) was not given [81]. In other parts of the world, Colombia [28], Guatemala [27, 202], Honduras [116], Belgium [201] and in the Eastern Mediterranean [172], whole or bean flours were not used. In Asia legumes not eaten were more commonly grams and dhals both the grains and flours, i.e. gram flour besan. Responses were received from Bangladesh [180], India [121, 183, 211], Pakistan [38, 141] and Sri Lanka [188]. In Belgium these legumes were avoided [201].

Vegetables

Unspecified vegetables were avoided in the following countries: Tanzania [124], Burma [175], Malaysia (cold foods) [143], as well as in Belgium [201] and the Chinese residents in the United Kingdom [193]. Other foods were specifically identified - for example, cold foods, such as pumpkin, other squashes in Bangladesh [180], in South India [121] and Guatemala [27]. Jackfruit was included in the Philippines [94]; green vegetables in a ripe or unripe state, (e.g. tomatoes) were not eaten in Bangladesh [119] and also in Guatemala [27]. Green leaves were avoided in Bangladesh [180], in Pakistan [117] and India [121]. Onions and garlic were withdrawn from the diet in Hungary [14].

Fruits

Some fruits recommended in diarrhoea paradoxically were also proscribed in the disease. No reports were received from the Eastern Mediterranean region. Fruit juices were not given in Guinea Bissau [96] and among Mexican-Americans in the USA [51]. Citrus fruits, oranges, limes, lemons, were avoided in some countries, i.e. Tanzania (oranges) [124], in Sri Lanka [188], India [55], Malaysia [145] and Vietnam [145] and in Peru [59]. Soft dates were not

given in Sudan [57], the Kogha fruit in Papua New Guinea [210], guavas in India [183] and mangoes in Bangladesh [180], South India [55], Malaysia [143] and Vietnam [145]. Pineapple, a "cold" fruit was not advocated in South India [55] or Malaysia [143]. The banana was not used either ripe or cooked in the following countries: Tanzania [124], India [55], Malaysia [143], Peru [59], North East Brazil [162], Guatemala [27] and among Mexican-Americans in California (USA) [51] by some individuals. Coconuts were, however, stated to be avoided in the Philippines [145] and South India [55]. Raw fruits on the whole were not eaten in India [183].

Oils and Oil seeds

Oils were omitted in diarrhoea in Kenya, sim sim [89], in India, mustard oil [183], as well as butter and ghee (clarified butter) [50], non-specific oils in the Philippines [94] and fat in Guatemala [159]. Also included were oils donated in food programmes [27]. Oil was withdrawn from the diet in Hungary [124].

Little information was available on oil seeds except for the non-use of groundnuts in China and Taiwan [219] and in Nigeria [148] and some unspecified nuts in Bahrain [160].

Miscellaneous

Other food items and methods of preparation used were thought unsuitable and were avoided, but the stage at which their use was curtailed was not mentioned, for example, "sweets" in Nigeria [173], molasses in India [183], as well as in Jordan, and sugar in the latter country [202].

Fluids

Water was not given in some countries, as it was thought it would increase the number of stools, e.g. in Kenya [164], in Niger [173], Tanzania [124], in India (Punjab) [121] and other areas [19], in Pakistan [119], in Peru [59], Trinidad and Tobago [6]. Unboiled water was omitted among Chinese in England [204] and among the population of the Solomon islands [21]. Chocolate drinks were not used in Colombia [28] and alcohol consumption was not recommended in India during episodes of diarrhoea [183].

Food Preparation

Raw or cold foods such as vegetables, in Vietnam [145], but cooked vegetables were equally injurious [145].

Hot and Spicy Foods

Chili peppers were the spices most commonly mentioned as inadvisable in diarrhoea - in Guinea Bissau [148], China [219], India [121, 183, 181, 191], Thailand [10], Peru [59], Bahrain [160], Tunisia (*harissa*) [202], and Hungary [124]. Less frequently mentioned were black pepper in the Philippines [145] and Tunisia [202], and oregano in Peru [59].

Fried Foods and Greasy Preparations

The use of fats and oils in cooking was believed to be inadvisable in the following countries: Ethiopia (as they were "wet" foods) [2], Tanzania [124], China [222], India [19, 50, 183], Peru [59] Belize [201], Antigua [113], Puerto Ricans in the USA [135], Mexico [152], Bulgaria [129], Hungary [127] and Bahrain [159].

Others

"Heavy" foods, in Colombia [28] and Mexico [153]. "Hard" foods in Tanzania [124], "solid" foods in Somalia [2], Philippines [95] and Western Samoa [56]. "Salty foods" in Colombia [28], as well as "sour" foods in India [183] and Thailand [10], and "wet" foods in Somalia [2]. Also included were "stale" foods cooked the day before in India [191].

A.3. Foods Avoided in Pregnancy and Lactation

Some foods if eaten in pregnancy and lactation, were commonly believed to cause diarrhoea in the mother, and in the foetus and the newborn, and ill effects of the wrong maternal diet could also it is believed be transmitted via breast milk to the neonate. Such beliefs lead to proscriptions of certain foods during pregnancy and lactation.

Staple Foods

The withdrawal of cereal grains in pregnancy or lactation was not mentioned but emphasis was placed on non-cereal staples - roots and plantains. The following were to be avoided: yams in Sri Lanka [188] and Egypt [91] where mothers commonly reduce their food intake, also in Tamil Nadu, South India [55, 57]. Further avoidances in Tamil Nadu included sweet potatoes, considered a very dangerous food likely to cause diarrhoea and fits in the breastfed baby, as well as green plantains. A belief in some places was that the intake of starchy staples could thicken the milk, which would be prejudicial to infant health. Plantains were also not eaten among lactating Black Carib mothers in Guatemala during the early months [187].

Animal Milks

Milk was not taken in Guinea Bissau [178] and buffalo milk during lactation in India (Tamil Nadu) [53] as it was a cold substance provided by an animal which waded in water and ate "cold" water plants. Equally, in India, curds were not eaten [9] and in South India were believed to be harmful to the baby [55]. Yoghurt was avoided in Sri Lanka [188] and white cheese among the Black Carib women of Guatemala [187].

Meat and Eggs

Meat from a non-specific source was not eaten in the Sudan [166] nor in South India [85, 191]. Beef was avoided in Sri Lanka [188], buffalo, which could make breast milk indigestible, in Thailand [10], and both beef and pork in American Samoa [58]. Poultry meat was not eaten in the Sudan [166] and eggs were commonly avoided in South India, especially immediately after delivery until the lochia stopped, and for the following month [156, 183]. Eggs were not eaten in Burma [61, 175] or in the Philippines in the urban areas [82].

Fish

Generally, this was not eaten in the Sudan [166] and if eaten with other animal foods was believed to provoke diarrhoea in the infant in India (Tamil Nadu) [55]. Blood fish and crabs were avoided in Sri Lanka [188] and the flesh of larger fishes, such as snapper, jackfish and shark, was believed to cause rancidity of breast milk among the Black Caribs of Guatemala [187].

Legumes

These were generally avoided in Sri Lanka [188] and Burma [175], dhal in South India as well as gram flour (besan) [192], grams and lentils in Pakistan [221], mung beans in Vietnam [145] and beans in Guinea Bissau [178].

Vegetables

Unspecified vegetables were mentioned as not being eaten by pregnant women in Southern Africa [149], Guinea Bissau and Swaziland [149], also in Burma [175] and in Vietnam (both raw or cooked) [145]. Fermented vegetables were avoided by lactating women in Thailand [10]. Certain foods were stated to be avoided, eggplant in Sri Lanka [188], jackfruit [9, 55], as well as gourds and squashes, in South India [55] and also spinach [197], the latter was not used in Vietnam [145]. Avocados were not eaten in Mexico [152] and in Guatemala among the Black Carib mothers [187] and chilis in Guinea Bissau [149] and India [183].

Fruits

A variety of citrus fruits were avoided in pregnancy or lactation, e.g. oranges, lemons, in Thailand [10], South India [55] and Vietnam [145] and among the Black Caribs in Guatemala [187]. Pineapple was not eaten in South India [55], Sri Lanka [188] and Vietnam [187], nor was papaya in India [55, 183] or Thailand (papaya salad) where tamarind was also avoided [10]. Mangoes were shunned in India [9, 55, 192], in Sri Lanka [188], among the Black Caribs in Guatemala [187] and Mexico [152], in South India [192], melons and sugar cane in Vietnam [145].

A number of other fruits are avoided in pregnancy and lactation in India, such as custard apples (*Annona reticulata*) and guavas, the mere smell of the fruit was thought to cause diarrhoea in the infant [9, 55, 183], the palmyra fruit (*Borassus flabellifer*) [55]. Jocote (Spanish plus) is avoided among the Black Caribs of Guatemala as well as raw bananas especially in lactation [187] and long bananas were avoided in Vietnam [145], coconuts were also not utilized, especially milk from the "great coconut" species in India, Tamil Nadu [55], in Sri Lanka [188] and the Black Caribs, especially in the early months of lactation [187].

Miscellaneous

Avoidance of spices was mentioned from India and the use of mustard oil [183], and restriction of water intake in Peru [59].

Food Preparation

Unsuitable hot or cold foods were not to be given to pregnant and lactating women in Sri Lanka [188], also other specific examples to be avoided by these women and other individuals include raw and cold foods in Vietnam [145], fatty foods in Thailand [10] and American Samoa [58], fermented foods, e.g. bread and kisra made from sorghum in the Sudan [57] as well as other such foods in Thailand [10] and sweet foods in the same country [10], salty foods in the Sudan [166] and Colombia [28] and hard foods such as milk, meat, eggs, beans in the latter country [28].

A.4. Foods Recommended for Young Children with Diarrhoea

Staple Foods

(a) Cereal grain staples

Rice. This staple was the most commonly mentioned and appeared to be given in all regions of the world and multiple responses were received from 39 of the 74 countries surveyed (53%). Rice was administered in two main forms - rice water or thicker preparations. However, thickness and viscosity of the rice was not always indicated in the reports. Nor was the time of administration indicated, e.g. at the onset of diarrhoea or in recovery or convalescence, nor the frequency of feeding. Nevertheless, a number of terms were used, e.g. congee [183, 188], bubor [151], rice oil [219], suero [144]. Some recipes were included. Rice water was stated to be given in the following countries: Egypt [1], Sudan [57], Somalia [95], Philippines [179] Nicaragua [39], Haiti [41], Venezuela [170], Bolivia [5]. Rice soup was given in South Brazil [49] and thicker preparations in Ethiopia [7] and Guinea Bissau, among the Balanta and Balatmane tribes [96], in the Sudan [57], Somalia [95], Tanzania [114], as well as in Asia, e.g. Bangladesh [180], Burma [120], China [219] and in different regions of India [17, 32, 55, 114, 183], Hong Kong [215], Indonesia [146], Nepal [77, 80], Taiwan [219], Pakistan [93, 117, 141], Philippines [52, 163], Sri Lanka [188, 189]. Also in the Americas and other countries, e.g. Ecuador (rice suero) [144], Nicaragua [39], Guatemala [27], Dominican Republic [144], Haiti [41], in North America, Mexico [68], USA [52, 111]. In Europe, recent reports confirm the use of rice in diarrhoea, e.g. in Bulgaria [129], Greece [197], Iceland (as soup) [186], Norway [66]. Rice was also administered in Jordan, Tunisia [202], Syria [40] and in Fiji among the East Indian population [117].

The form in which the rice was prepared varied, sometimes it was pounded flat in India (West Bengal) (chira) [100] or unparboiled rice was used (atop). In Bangladesh [180], quite often it was parched, toasted or roasted. In China [219] and in Bangladesh [180] rice was popped like maize (pori) and made into congee [189]. Rice gruel and powder were given in Bangladesh [119], India [185]. In China, "milk cube" made of non-glutinous rice powder without milk, are used. A cube, dissolved in water, is steamed and fed if the child is not anorexic [221]. Rice starch mixed with other starches, flavoured with almonds and spices (mahalabya), is used in Egypt [91, 92, 98], with cinnamon in Colombia [28], and in Bolivia [5] and with lemon juice in Greece [197].

Some reports suggested that the viscosity of the rice preparation would be increased as the sick child improved and other foods would be gradually introduced. These included fermented milk, palm oil and calabacaru fruit in Guinea Bissau [96], fish and fermented palm wine in Angola [178], coconut oil and onion in India, as well as added curd for children [50]. Pounded fish is also included in Burma [120] and in the Philippines [39, 94], as well as powdered or pounded pulses added to the rice, in Burma [120], in India [17, 192] (kicheri), Pakistan [141] and Nepal [80]. In the latter country the use of sarbottam pitho, a modern adaptation of a traditional recipe prepared to rehabilitate malnourished children, may be gaining popularity at the household level; it is a powdered mixture of roasted soybeans and grains, such as rice, maize, wheat, which is cooked in water or milk [80]. In China, mashed pork, ham, green leaves cooked in oil and seasoned with salt is stated to be added to the rice [219].

Barley. This cereal appeared to be used as a substitute for rice in Bangladesh [119, 170, 202], while one author stated it was not given to breast-fed children in Pakistan [118]. Powdered barley porridge was used in India, West Bengal [32, 100]. In Ethiopia, a mixture of barley with butter and honey was mentioned [2], also mixed with teff.

Maize. Maize was used in Tanzania [124], both as thick and thin gruels, also in Ethiopia as a thin gruel [7] and both thick and thin mixtures in Angola [178], South Africa [149], as well as India [183]. In South, Central America and the Caribbean, preparations of maize were given in the form of starches (api), in Bolivia which was sometimes flavoured with vanilla or cinnamon [5] and in Colombia [28]. Thin gruels, atole, were used in Guatemala as well as the commercially prepared Incaparina [27]. Maize porridges were used in Barbados [75, 167] and Haiti [41], in the form of tortillas in Nicaragua [39]. In Europe, it was stated to be given in Bulgaria [129].

Wheat. Various preparations were given such as flour porridge, breads, rusks, biscuits or commercially prepared infant foods. In India, wheat cooked in milk was used (dalia) [192]; in Egypt, wheat soup was recommended with added sugar (belila) [92]. Porridges were administered in Ethiopia, made of emmer or refined wheat flour [7] and in Tanzania [124]. Parched wheat flour porridges have been used for many years in Antigua [113], Barbados [79], Trinidad and Tobago [75, 76, 107] and Jamaica [123]. The consumption of bread in small quantities in diarrhoea was mentioned from Bangladesh [119] and Nepal [80]. It was given in the form of a bun eaten with coffee in India, Coimbatore [50], as chappatis in Pakistan [141], rusks and toasted bread eaten with pori in Sri Lanka [188]. Panatelas were given in Peru (toasted bread, flavoured with sugar and anise, but without the addition of salt) [59]. The use of white bread was also stressed (Guatemala [65]), in Belgium [201], and Norway [66]. Crackers or sweet biscuits made often from wheat could be eaten crushed in water or plain in China [219], Bangladesh [170], Sri Lanka [188], the Philippines [52], Taiwan [219], Egypt [92] and Bolivia [5]. Noodles were eaten in Bolivia [5] and Guatemala [27].

Millet, Sorghum & Teff. Various species of millet were made into thin or thick porridges in Namibia [144], in the Sudan (mixed with a tree bark infusion) [57], red millet was utilized in Nigeria [44], other species in Tanzania [124] and in South Africa [178]. This cereal was recommended in diarrhoea in China [213] and in India cooked with milk [192]. Preparations made from Sorghum were reported from the Sudan [7] and Kenya among the Luo people [44], and teff (injira) was used only in Ethiopia [7].

Oatmeal. Very few responses were received on oatmeal. Thick preparations were stated to be given in India [183], Guatemala [27] and Bolivia [5].

b) Non-cereal staples

Potato. This was used in diarrhoea as soups, or as soft boiled or semi-solid preparations as mashed potatoes. In Bangladesh, the consumption was stated to be reduced [119]. Potato was consumed in Peru and Chile [184], and in Bolivia mixed with rice [5], in Venezuela (as a soup) [170], as well as in south Brazil [49]. Also in countries of the Eastern Mediterranean region, Egypt [92], Jordan [202] and Syria [40]. Potatoes were eaten in Europe, as potato water in Hungary [14, 192], whipped potatoes and other preparations in Iceland [186] and in Bulgaria [129].

Sweet potato. This was given as a dilute gruel in Indonesia [146] or mashed in Belize [199].

Cassava. Grated cassava cooked in water was used among Fijians [158]. Flour preparations were fed to patients in Southern Africa mixed with milk or water [183], a soup in Bolivia [5], as well as tapioca in Belgium [201].

Yam and other tubers. Chinese yam starch (*Dioscorea esculenta*), lotus root gruel and taro (*Colocasia antiquorum*) were given in China [219].

Arrowroot. This starchy gruel is made into congee in India generally [183] and was mentioned in specific regions, rural West Bengal [13, 100] and Uttar Pradesh [191]. It is commonly used as a porridge in the Caribbean area; e.g. Barbados [75, 78], Jamaica [123, 171], Trinidad and Tobago [25].

Sago. The use of sago was reported from Bangladesh [201], west Bengal [13] and Pakistan [93].

Banana and Plantain. Banana preparations included fresh ripe fruits or boiled or baked. Different varieties were used and thick preparations were given in Somalia [94] and Tanzania [124]. In Asia, banana was added to rice in Bangladesh [180], although the amount of the fruit was reduced in diarrhoea [119]. In India, it was mashed with milk [183] and, at times, opium was added [191]. It was used in Pakistan [141] and in the Philippines [81], in this country a commercial preparation of powdered banana was sometimes given both sweet and starchy fruits were used in Sri Lanka [188] diluted with water. In the Americas, banana was given in Peru [59], Guatemala [27, 65], the USA [112] and among Mexican immigrants [51], and in Haiti [41]. A special type of banana with many seeds was given in Papua New Guinea [210]. Three authors mentioned the use of plantains, the unripe fruit made into chappatis in India [183] and a soup given in Venezuela [170] and Bolivia [5].

Starches of unspecified origin. Cold starch solutions and a starch pudding with lemon and other flavourings (balouza) in Egypt [92], Bolivia [5], Peru [59], Barbados [167], and Bulgaria [129].

Breastmilk

Breastfeeding was encouraged in the Sudan [57], Burma [120], China [219]; given on demand in Bangladesh [119] or reduced [180]; given in India [183], in Bengal [32], Uttar Pradesh [190]. In villages south of Delhi, 95% of mothers gave breast milk throughout diarrhoea [17]. Breast-feeding was continued in Pakistan [38] and routinely in Nepal [80]. In Egypt, it was stated to be reduced in amount or sometimes tea was given as a substitute [92]. During the acute onset of diarrhoea, nursing was stopped in Bolivia [23], also in Nicaragua [39], Belize [199] and Syria [40], but the number of days was not mentioned. Milk and milk products were given in Jordan and Tunisia, no statement was made regarding nursing [202]. In the island of Haiti, conflicting reports were given; i.e. breastfeeding was continued countrywide or reduced in urban areas [41, 103, 165]. In Hungary breastfeeding was given throughout the illness [127].

Other Animal Milks

These were given whole, diluted, reduced in quantity or withheld, raw or boiled. Fresh or boiled cow's milk was given in the following countries: Guinea Bissau [178], Tanzania [124], South Africa mixed with cassava flour and made into porridge [178], the Sudan used sometimes as a custard [57]. Cow's milk in unspecified form in Peru [59], Barbados [167], Haiti [41], Mexico [152], Belgium [201], in Jordan as well as Tunisia where it was flavoured with coriander and laurel leaves [121]. In Bangladesh, goat's milk was given as well [119, 180], sometimes in India [183] it was drunk unboiled with lemon added [17], in Pakistan [117], the quantity was reduced at times [118], and milk was used in Nepal [80]. Other milks such as camel and donkey's milk were mentioned from Niger [37] and buffalo milk in Egypt [92]. Commercially prepared milks were used such as skimmed condensed milk when affordable in Bangladesh [180] and diluted condensed milk in the Philippines [52, 82]. Commercial formulae were also given and were mostly diluted; e.g. in Ethiopia [7], Bangladesh [180], India [32], Syria [40]. These were stopped in Egypt [1] and Dominica [64].

Preparations of curds and yoghurt were commonly used in Ethiopia [2], Niger [35], Bangladesh [180], India (lassi) [17, 50, 100, 183], in Pakistan ghee was sometimes added to the curd [203]; in Nepal (curds and yoghurt) [80]. These products were also given in Egypt [1, 92]; Fiji [158]; and Bulgaria (curdled skimmed milk) [198]. References to the use of cheese were uncommon. These were described as white, cream or cottage cheese, often unsalted and given in Bangladesh [180], Egypt [92], Guatemala [27], and Belgium, [201].

Many recipes were given with the origin of the milk not stated in the following countries: Guinea Bissau [96], India [50, 183], Southern Brazil [49], Guatemala [27], Belgium [201].

Meat. This food appeared to be introduced in the diet after the initial stage of the disease, sometimes in early convalescence. In some countries, it was not given because of cultural beliefs (e.g. as a cause of worms) or because of cost. The type of meat was not always specified. Meat was given in India [183], Taiwan [219], China (ham and pork liver) [219], Haiti [41], Hungary [14] and Belgium [201]. In some countries, leanness of meat was mentioned. Chicken was used in soups in Taiwan [219], Egypt [1], Venezuela [170] and chicken gizzard meat in Jamaica [177], and among the Mormon sect in the USA [183]. Unspecified chicken parts were given in India [183].

Fish. Species were not identified in some countries; e.g. Angola [178], but the leanness of the fish was stressed from Belgium [201], the method of preparation in India, "well-cooked" [183], "broiled" in the Philippines [94]. Species mentioned were the following: sardines among the Boers of South Africa [73], a special type of catfish in Bangladesh [180], dog salmon and dry halibut among the Kwakiutl Indians of Canada [22] and defatted fish meal in China [219, 222].

Eggs. Boiled chicken and duck eggs were eaten in India [183] and Pakistan [141], although at times the amount was limited in Bangladesh [119] and soft boiled eggs were used in Bolivia [5]. The white of the egg only was sometimes given mixed with water in rural Pakistan [8, 38] and in Belgium [201]. Raw egg was administered with brandy in Barbados [167] and Jamaica [123].

Legumes and Oil Seeds. A number of these were used in different forms such as cooked gram or dhal, peas, masur (lentils). These were prepared roasted, in Bangladesh [180] (although it was stated quantities given were often reduced), and also used in India [183]. Mixtures of unspecified legumes and rice were given in Nepal [80], as kicheri in India [17, 183], Pakistan [141], and mung beans in Bangladesh [180, 91]. In Egypt, chick peas were used as well as a variety of beans, germinated and stewed [1, 92]. Beans were also used as a sauce in Haiti [41], as bean water in Angola [178], as a soup in India [183] and the Philippines [52] and broth made from the ground bean (frijol de suelo), in Guatemala [27]. Soy bean milk was given in Burma [120], in Nepal [80], in Japan [200], in Nicaragua [39] and in Europe, Bulgaria [198] and Iceland [186]. Peanut water was recommended in Guinea Bissau [96], and cashew nut preparations in Nigeria [60]. Ground sesame seed preparations and the strained water from repeatedly boiled fenugreek seeds in Ethiopia [7].

Vegetables

A variety of these were mentioned, but methods of cooking were rarely discussed. Green leaves of different species were given both in mainland China and Taiwan [219]. At times the leaves were cooked with finely pounded ham and could be given to children under two years. In Bangladesh, the amount of vegetables given varied in urban and rural areas, green leaves (lak and neem) were mentioned as were unspecified bitter vegetables [180]. Wild mint leaves were prepared in Iraq and Iran [88], cooked onions in Nigeria [97] and avocado in Bolivia [5]. Vegetable juices were mentioned, tomato in Egypt [92] and beetroot in Haiti [41]. Vegetable soups were given in Egypt [92] and soups made from grated or mashed carrots were widely used in Niger [37], Somalia [95], as well as in India [183] and in China carrot juice and soup [219, 222], in Colombia [28], Guatemala [27, 65], in Haiti [41], Trinidad and Tobago [6], also in Europe (both the soup and mashed carrots were given); in Bulgaria [129], Greece [197], Iceland [180]. Salted vegetables were used in China as well as agar jelly [222].

Fruits

In the Philippines, the following were recommended; the cashew fruit, santol (Sandoricum Koetjape), custard apples (Annona sp.), mangosteen pulp (Garcinia mangostana) and the rind of the passion fruit [82]. This was also given in Bolivia [23]. In South Africa, the Chinese fig was used [73] as well as papaya [149] which was also eaten mixed with curd in India [183]. Other miscellaneous fruits were utilized, such as tender pomegranate in India, Tamil Nadu [9, 50] and in Taiwan [219], the wood apple, beli fruit (Aegle marmelos), in Sri Lanka [188], also in West Bengal, India [100] and Bolivia [5], mashed pears in Egypt [92]. The guava was commonly used as a constipating agent, in the form of a powder in the Philippines [3], as a flour in Bolivia [23], in Peru [59], as a fresh fruit in Barbados [47]. Carob powder (rich in pectin) and tamarind seed concoctions were given in India [183]. Fruits were generally recommended in Bangladesh [119, 101].

Non-specific juices were recommended in Nepal [80] and Belize [199]. A variety of citrus fruits were given as a pulp or a juice; e.g. lime, lemon, orange, grapefruit, sometimes with added sugar. These were used commonly in Angola [178], Guinea Bissau [96], Tanzania [124], India [17, 49, 183]. Sometimes mixed with milk in which mullein leaves were soaked [183], also in Nepal [80] and Sri Lanka [188]. These juices were popular in Brazil [48], Haiti [41], Egypt [92] and Belgium [201].

Pectin-rich apples were given in different forms; e.g. cooked apples and apple soup in Taiwan [219], apple juice for older children in Egypt [1], mashed and puréed finely in Brazil [49], Venezuela [170], Guatemala [65], Bulgaria [129], Hungary [127], Iceland [185].

Fluids. Among some groups, fluids were restricted in the belief that the diarrhoeal episodes would become less frequent. However, a variety of fluids were encouraged in some communities. These included cold or cool water in Tanzania [124], South Africa and Guinea Bissau [149], both before and after breastfeeding, boiled cool water, in Peru (boiling being thought to remove unsuitable rawness) [59, 203]: lotus seed water and vegetable water were used in Taiwan [219]. Home-made sugar solutions were given in India (sometimes made with jaggery), in Nepal [80], in Trinidad and Tobago [122], as well as Jamaica [123] and among the Mormon sect in the USA [60]. More expensive solutions prepared with commercial glucose powder were administered in China and Taiwan [219], Bangladesh [180] and India [17, 100], Peru [59], Barbados [160, 172], Dominica [62], Jamaica [177], and Trinidad [25], and in Norway [66]. Jaggery, honey and water were used in Ethiopia [7], Egypt [92], Sri Lanka [188] and the USA [62]. Water with added salt was given in Peru [59], or apple cider and vinegar in India [183] and baking soda and vinegar in Louisiana in the USA [24], lemon water in India as well as lime juice and teas, and coffee [17, 50]. Well-known brands of carbonated drinks such as Coca Cola and 7-Up have gained popularity as beverages given in diarrhoea in the Caribbean, including Barbados [160] and Haiti [41], and in some other areas of the world. Home-made or commercial preparations of rose water are given in Iran and Iraq [88].

In Bangladesh, the use of coconut water and milk was increased in diarrhoea [119]. Green coconut water was also given in India [183], Brazil [49], Mexico [152] and coconut milk in Belize [199].

Oils and Fats

A variety of these were given seemingly for non-purgative reasons, unspecified oils in Nepal [80], Guatemala [27] and in India, although at times syrup and chili were included in the oil [183]. Palm oil was used in Guinea Bissau [96], and olive oil in some Eastern Mediterranean countries [88] and almond oil was stated to be the only food given in diarrhoea in Iran, it was also used in Iraq [174]. Zebu fat was recommended in former French West Africa, chicken fat in Madagascar in 1968 [148] and mountain goat fat among the Tinglit Indians in the USA [150]. Hard foods were recommended in the USA among the Kwakiutl Indians in the USA as they were believed to lessen diarrhoea [156].

ANNEX B: CULTURAL CONSIDERATIONS: DETAILED REVIEW

Hot Foods

Staples: Rice and kelp soups are given postpartum in Korea, rice and gaeng liang, known as "nurturer's" soup in Thailand [200]. Wheat in Mexico [68], millet in Sri Lanka [188], maize in Haiti [41] and processed dried cereal foods among the Chinese living in England [209]. Fried potatoes among the Chinese in the United Kingdom [209], cassava in West Malaysia [151] and Sri Lanka [188] and a number of unspecified tubers in Malaysia [143].

Milks: In many countries whether human milk is "hot" or "cold" depends on the maternal dietary, as in India [17]. Unspecified animal milks in India [183] and West Bengal [100], in Guatemala [27] and Mexico [70]. Dried cow's milk in Sri Lanka [188], milk formulas in England (Chinese group) [209], and milk to which cinnamon had been added in Mexico [152].

Meat and Eggs

Meat in general in Malaysia [200], India [97], Guatemala [27], Mexico (Yucatan peninsula) [150], beef in Guatemala [27] and Mexico [68], and among the Chinese residents in England [209]. Pork meat in Peru [59] and Mexico [152] as well as hen and goat meat [68], chicken in Nepal [80] and Colombia [18] and fried fish in England among Chinese residents [209]. Eggs were believed hot in West Bengal, India [100] and egg yolks in Guatemala [27] and boiled eggs were considered "solid" hot foods among the UK Chinese [209].

Legumes: Unspecified in Peru [59], beans in Mexico [68] and the ground bean in Guatemala [27], masuri dhal (*Lens esculenta*) in West Bengal, India [100], oil seeds, such as peanuts in Mexico [68], miso soup made of soy bean in Japan given postpartum [200].

Vegetables and Fruits: Tomatoes in Sri Lanka [188] and in Mexico where they are believed acidic and hot, avocado [68] and squash leaves grown during the hot season [152], durian (*Durio zibethinus*) in Malaysia [34] and bamboo shoots in England (among Chinese) [209]. Unspecified fruits in Mexico [68]; other fruits mentioned included figs, custard apples (*Annona cherimola*), the capulin cherry, orange blossoms and coconuts [68]. Fruit juices among Mexican Americans in the USA [42] and bananas in Peru [60].

Drinks: Fermented juice of the maguey plant (*pulque*) in Mexico, and beer, wine or milk in the USA, these are given as hot foods postpartum [197]. Chocolate, coffee, mescal (cactus liquor), in Mexico [152]. Other substances included sugar and honey in West Bengal, India [100], oils not specified in Peru [59] and Mexico [68, 152], cod liver oil used medicinally in India [100]. Also spices and herbs, chili peppers in Guinea Bissau [96], black pepper in Malaysia [143], others in Mexico such as garlic, epazote, rue [68], basil, cilantro, especially when used with beef dishes, and oregano [152]. This spice as well as cinnamon was also hot in Peru [59]. Unspecified plant infusions in Malaysia [143], Guatemala [27], "Yerbas Buena" hierbas, in Mexico [68].

Food Preparations: Tortillas (when maize treated with mineral lime) in Mexico [68, 152]. Fried and greasy foods in Malaysia [151], Mexico [152], among Chinese living in England [209], grilled and roasted foods in Malaysia [151], and in England (Chinese residents) [209]. Spicy foods, not specified in China [219], Malaysia [151], Peru [59] and Mexico [68, 152].

Cold Foods

Staple Foods: Rice and rice water in West Bengal, India [100], toasted rice water and white rice in Colombia [28], rice in Trinidad and Tobago [6], in Mexico [68], dilute rice congee with marinated pork among UK Chinese, also noodles among the latter group [209]. Maize in Mexico [68, 108] and tortillas among Mexican Americans in the USA [51]. Barley water in Bangladesh [180] and barley in Trinidad and Tobago [6] as well as Mexico [68]. Potatoes were described as cold in Bangladesh [180] and Mexico [68].

Milks: Human milk was stated to vary with the maternal diet in some countries, for example, Sri Lanka [188]. Unspecified animal milks in Mexico [68, 152], cow's milk in Sri Lanka [188] and Bolivia [5], commercial milk formulas in Sri Lanka [188]. Curds and buttermilk in India [183], in West Bengal (acid buttermilk) [100], in Malaysia [211], Sri Lanka [188], yoghurt in West Bengal, India [100], and cheese in Bolivia [5].

Meat: Pork meat was considered cold in Guatemala [27], Bolivia [5] and, when marinated with salt, made into soup with added rice congee among UK Chinese [209]. Rabbit meat, duck, chicken, and beef cooked with the spice cilantro in Mexico [68]. Fried fish among Chinese women, as well as unspecified seafood among such immigrants in England [209]. Eggs were mentioned from Bolivia [5] and Mexico [68]. Legumes, such as beans, in Guatemala [27] and thin black beans in Mexico [68].

Vegetables: Non-specific varieties were generally mentioned; e.g. from Tamil Nadu, in India [55], Malaysia [143], Sri Lanka (bland vegetables) [188], and among immigrant women of Chinese descent in England [193], as well as vegetables cultivated in the rainy season in Mexico [152]. Some vegetables were mentioned by name - for example, yellow or green varieties in West Malaysia (Ulu Trengganu) [141], including cucumbers in other regions [34], as well as in Peru [59] and in Mexico, where avocados, celery, chili peppers were also considered cold [152]. Pumpkins, squashes and gourds (especially ash pumpkins) were cold or very cold in South India [55] and in Trinidad and Tobago [6], their leaves and seeds in Mexico [66, 152]. Strained carrots were mentioned from Trinidad and Tobago [6], and green leafy vegetables in Malaysia [34], as well as in Sri Lanka, where mushrooms and imported vegetables were also believed to be cold [188].

Fruits: Generalizations were made regarding coldness of fruits from Malaysia [143, 151] and Peru [59]. However, fruit juices were considered cold in Guinea Bissau [96], and among Mexican Americans in the USA [51]. Papaya was avoided in Malaysia [34, 151] in the treatment of cold diseases including citrus fruit juices in a number of countries; for example, oranges and limes in Malaysia [34, 143], India, lemons and in West Bengal [100], Sri Lanka [188], as well as limes, lemons in Bolivia [5], Mexico [68, 152] where other fruits such as grapes, pears, watermelons and "European" fruits were also cold. Pineapple was specifically cold and sharp in Malaysia [34, 143], in Sri Lanka [188] and Mexico [68, 152]. Other fruits included bananas in Guinea Bissau [96], Malaysia, certain types [143], in Peru (when cooked) [59], and among Mexican Americans in the USA [51].

Fluids: These included water in West Bengal, India [100], unboiled water in Peru [208], tap water among the Chinese families in London [209], soft drinks, beer, a mixture of tomato skin, ash and sugar, and herbal concoctions such as espinosilla in Mexico [152] and in Guatemala [27]. Vinegar was also considered to be cold in Malaysia [143]. Cold foods included honey and glucose in England among the Chinese [209], and pork fat and certain spices, such as coriander and artemesia in Mexico [152].

Food Preparations: These included bland starchy dishes in Sri Lanka [188], in China [219] and steamed foods among Chinese immigrants in the United Kingdom [209], bland unprocessed foods in Mexico and in that country the addition of salt rendered a hot food, cold [152]. Some patent medicines, e.g. bay rum, limacol, and milk of magnesia, were believed to be cold in Trinidad and Tobago [6].

ANNEX C - PLANT INFUSIONS GIVEN FOR DIARRHOEA

Reports of the use of plant infusions were received from the following world regions:
Africa: East Africa [194], Ethiopia [2, 125], Guinea Bissau [136, 144], Kenya [44], Namibia [136], Niger [173], Nigeria [60], Somalia [95], South Africa [85, 149], the Sudan [42, 57], Swaziland [52], Tanzania [121].

Asia: Bangladesh [180, 201], China [219], India [17, 19, 100, 183, 191, 195], Indonesia [146], Pakistan [38, 93, 141], Philippines [3, 163], Thailand [10, 31], Malaysia [151], Nepal [80], Sri Lanka [188, 189], Taiwan [219], Vietnam [145].

The Americas: Antigua [113], Barbados [75, 77, 78, 167], Belize [199], Bolivia [5, 23], Brazil [49], Canada [214], Colombia [28], Ecuador [144], Guatemala [27, 43, 68], Haiti [41], Jamaica [123, 177], Mexico [68, 152], Peru [59, 184], USA [24, 30, 70, 90, 135, 156, 190], Trinidad and Tobago [6, 25, 108, 122], Venezuela [170].

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