

Regional features of complementary feeding in Africa and the Middle East

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1. INTRODUCTION

The aim of this analysis is to highlight regional patterns of breastfeeding and complementary feeding. Where regional patterns exist, it is important to consider them when setting priorities for promotion programmes. Countries that share similar patterns of inadequate feeding practices should share their experience and expertise, to design and monitor programmes for the improvement of infant feeding. Moreover, developing programmes at regional level could strengthen countries' individual capacity for implementing and evaluating programmes.

Questionnaires on infant and young child feeding practices were sent to all the countries that participated in the workshops on complementary feeding held in Alexandria (20–24 November 1994), and in Addis Ababa (12–15 December 1995). The participating countries belong to the Eastern Mediterranean region and to the African region of WHO.

The questionnaires comprised the key indicators for assessing breastfeeding practices (WHO, 1991), plus additional questions on complementary feeding. These questions focused on the timing of introduction of complementary foods, the type, nature and composition of foods, including energy density, and the frequency of preparation and distribution. Two types of complementary foods were distinguished: first complementary foods and solid foods.

The present analysis is based on the information provided by the participants, which is presented in detail in Chapter 8 and additional sources, Demographic and Health Surveys, and the WHO Global Data Bank on Breast-feeding.¹

There is to date no standardized format comparable to the WHO indicators of breastfeeding practices for collecting information on complementary feeding; therefore, not all countries were able to provide nationally representative data in the requested format. As a result, we included other types of information, such as data derived from surveys conducted in limited areas, and for some indicators, when no survey data were available, qualitative information given by the participants.

For the purpose of the analysis we grouped neighbouring countries, but our grouping does not reflect formal administrative divisions. Among countries of the Eastern Mediterranean region

¹ A detailed list of these references is given in Delpuech & Dop, 1999.

of WHO we grouped the North African states on one hand, and the Middle Eastern countries with Pakistan and Yemen on the other hand. Among countries of the African region, we separated West Africa, East Africa, Central and Southern Africa.²

2. INDICATORS OF BREASTFEEDING PRACTICES

Data from nationally representative surveys were available for all the countries except for Palestine and Syria. In Congo, a rural and an urban survey were conducted at different times (Tchibindat, 1999).

2.1 Initiation of breastfeeding

Overall, one third of neonates of the African and Eastern Mediterranean regions are put to the breast within one hour of birth, and two-thirds within one day.

Early initiation, within the first hour of birth, is unusual. In two countries only, Malawi and Zambia, more than half of neonates are put to the breast within the first hour. Moreover, initiation within the first day is not widespread; in eight African countries, less than one in two neonates is breastfed within the first day. The practice of giving prelacteal liquids to neonates is widespread and could be a major cause of diarrhoea and early mortality.

Initiation within the first day is more common in East Africa (mean 72%) than in West Africa (mean 52%) (Figure 1). In the three Mediterranean countries for which data are available, Egypt, Jordan and Morocco, two-thirds or more of neonates are breastfed during the first day.

Promotion of early initiation is especially needed in Cameroon and Niger where less than one third of neonates are breastfed within the first day.

2.2 Exclusive breastfeeding rate

The mean proportion of exclusively breastfed infants is somewhat similar in both regions, with 30% in Africa and 36% in the Eastern Mediterranean.

Low exclusive breastfeeding rates are a distinctive feature of West African countries: exclusive breastfeeding rates are below 15% in all of them, and the mean rate is 7%. In some countries exclusive breastfeeding is almost exceptional (Niger and Nigeria 1%, Burkina Faso and Côte d'Ivoire 3%) (Figure 2). Low rates are also found in other parts of Africa but with no regional pattern (Malawi 3% and Cameroon 7%). Rates are much higher in East African countries (mean 55%). The highest rates, about 90%, are observed in Ethiopia, Rwanda and Burundi. In the four Southern and Central African countries, rates are intermediate (mean 22%).

Among Mediterranean countries, the distribution of rates is narrower as neither very low nor very high rates are observed. Approximately half of North African infants are exclusively breastfed (53%). In the Middle East the mean rate is lower (24%).

² North Africa: Algeria, Egypt, Libya, Morocco, Tunisia. Middle East: Iran, Jordan, Lebanon, Palestine, Pakistan, Syria, Yemen. West Africa: Benin, Burkina Faso, Côte d'Ivoire, Ghana, Guinea, Mali, Niger, Nigeria, Senegal, Togo. East Africa: Burundi, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Rwanda, Tanzania, Uganda, Zambia. Central Africa: Cameroon, Congo. Southern Africa: Botswana, Namibia, Zimbabwe.

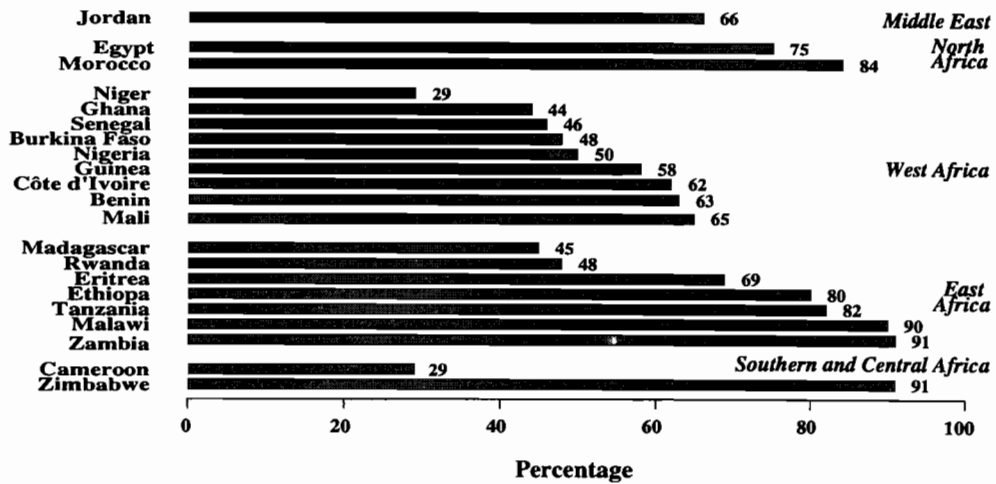


Figure 1
Initiation of breastfeeding within the first day of birth

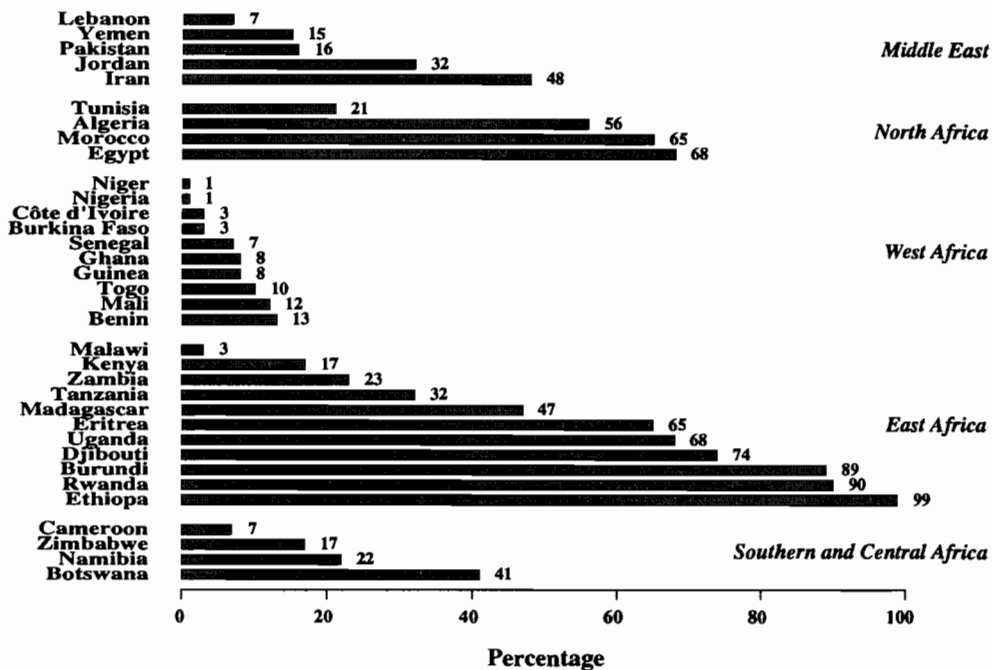


Figure 2
Exclusive breastfeeding rate (infants <4 months)

2.3 Rate of breastfeeding with plain water only

This indicator is used in place of the predominant breastfeeding rate — a key indicator recommended by WHO — because most DHS surveys estimate breastfeeding with plain water only (BF+W) and do not report separately breastfeeding with other water-based liquids such as juice, tea, etc. Values for this indicator are not available in Algeria, Iran, Botswana, Djibouti, and Ethiopia.

In both regions, approximately a third of infants less than 4 months are breastfed and given water (BF+W). Generally where exclusive breastfeeding is widespread, BF+W is uncommon and vice versa (Figure 3).

West African countries, whose exclusive breastfeeding rate is low, have a mean rate of BF+W of 48%, whereas in East Africa the mean rate is lower (20%). Five West African countries have rates above 50%, while the highest rate in East Africa is only 45%. Among Eastern Mediterranean countries, the rate is higher in the Middle East (mean 44%) than in North Africa (mean 16%).

Approximately two-thirds of African and Eastern Mediterranean infants less than 4 months are breastfed exclusively or with water. Some countries have both an exclusive breastfeeding rate and BF+W that are low, e.g. Benin and Kenya, where less than one-third of infants are breastfed either exclusively or with water.

2.4 Timely complementary feeding rate

In Africa, 65% of 6–9 month-old infants are receiving complementary foods in addition to breast milk, while only 52% receive them in the Mediterranean countries.

Marked differences are observed among regions of Africa: mean rates are high, above 70% in Eastern, Central and Southern Africa, whereas the mean rate is 54% in West Africa (Figure 4).

In five of the ten West African countries (Figure 4), less than half of the infants receive complementary foods at 6–9 months. In three countries — Guinea, Mali and Ghana — only approximately a third of infants are fed according to recommendations. In Mali, for instance, only 31% of infants are fed complementary foods, while 68% receive only water or other liquids in addition to breast milk.

In North African and Middle Eastern countries rates are also low, ranging from 30 to 70%, with the exception of Iran where almost all 6–9 month-old infants are fed complementary foods (93%).

2.5 Continued breastfeeding rate at one year

Two-thirds of children are breastfed beyond the first year in the Eastern Mediterranean region on average, while the mean percentage is 90% in the African region. Figure 5 illustrates the marked difference between the two regions.

In Africa, only two countries have rates below 80% (Namibia and Botswana), while in the Eastern Mediterranean region all countries have rates that are lower, except Iran (83%), and Pakistan (88%).

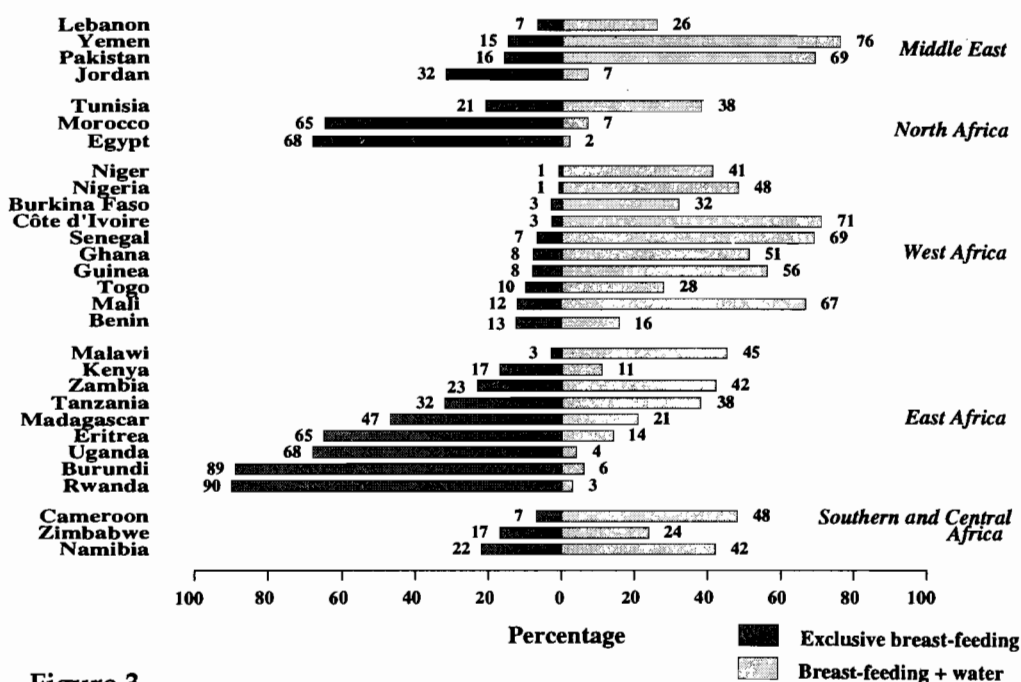


Figure 3
Exclusive breastfeeding rate and rate of breastfeeding with water (infants <4 months)

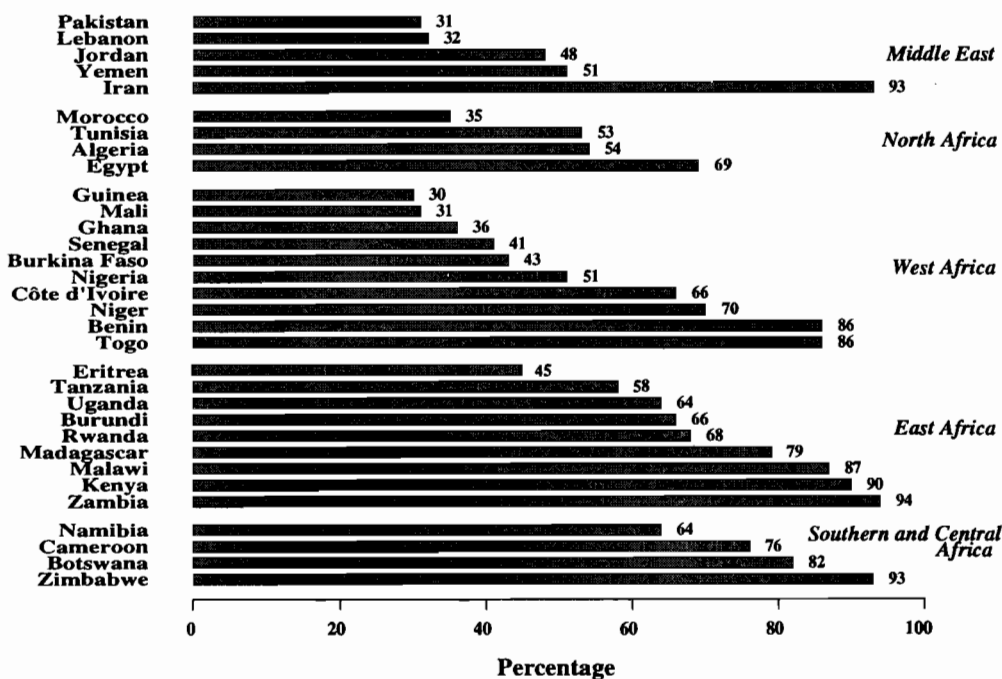


Figure 4
Timely complementary feeding rate (infants 6-9 months)

2.6 Continued breastfeeding rate at two years

The gap observed between the Eastern Mediterranean and the African region at one year, is less marked at two years. Less than one-third of young children are still breastfed in the Mediterranean countries (mean rate 32%) while more than half of African children are breastfed at two years (mean rate 54%).

A comparison of the median duration of breastfeeding between regions would yield similar results.³ Although the Eastern Mediterranean and African regions differ significantly in their median duration of breastfeeding they share a common trend, that of urban and educated mothers to stop breastfeeding earlier than their rural or uneducated counterparts (Perez-Escamilla, 1993). In the many countries where urbanization is increasing this will cause a decline in the duration of breastfeeding.

2.7 Bottle-feeding

For many countries, the WHO indicator (percent of infants less than 12 months who are fed from a bottle) could not be calculated from DHS publications because bottle-feeding among non-breastfed infants was not reported. Therefore we present the bottle-feeding rate *among breastfed infants less than 4 months*. This indicator could underestimate the true rate of bottle-feeding because non-breastfed infants are likely to be fed from a bottle.

In the Eastern Mediterranean region, the indicator is documented in the North African countries but in only one Middle Eastern country (Jordan, 25%). Nevertheless, the data indicate that the use of bottles is much more frequent in the Mediterranean than in Africa: the mean rate is 30%, while in Africa only 9% of infants are bottle-fed on average (Figure 6).

Bottle-feeding is more common in West Africa (mean 11%) than in East Africa (mean 5%). In two countries of Africa (Nigeria and Namibia), almost one-third of breastfed infants are bottle-fed.

3. COMPLEMENTARY FEEDING

3.1 First complementary foods

First complementary foods are the first nutrient providing foods given to infants in addition to breast milk. During the WHO/UNICEF expert consultation on complementary feeding of infants and young children,⁴ the term *special transitional foods* was often used to designate these foods because they are “specially prepared complementary foods designed to meet the particular nutritional and physiological needs of the infant and young child” (WHO, 1998).

Three types of foods were distinguished:

- foods prepared traditionally for infants and young children
- processed complementary foods designed for infants and young children
- nutritionally improved home-based preparations.

³ This indicator is lacking for several Eastern Mediterranean countries and therefore is not presented.

⁴ Montpellier, France 28-30 November 1995.

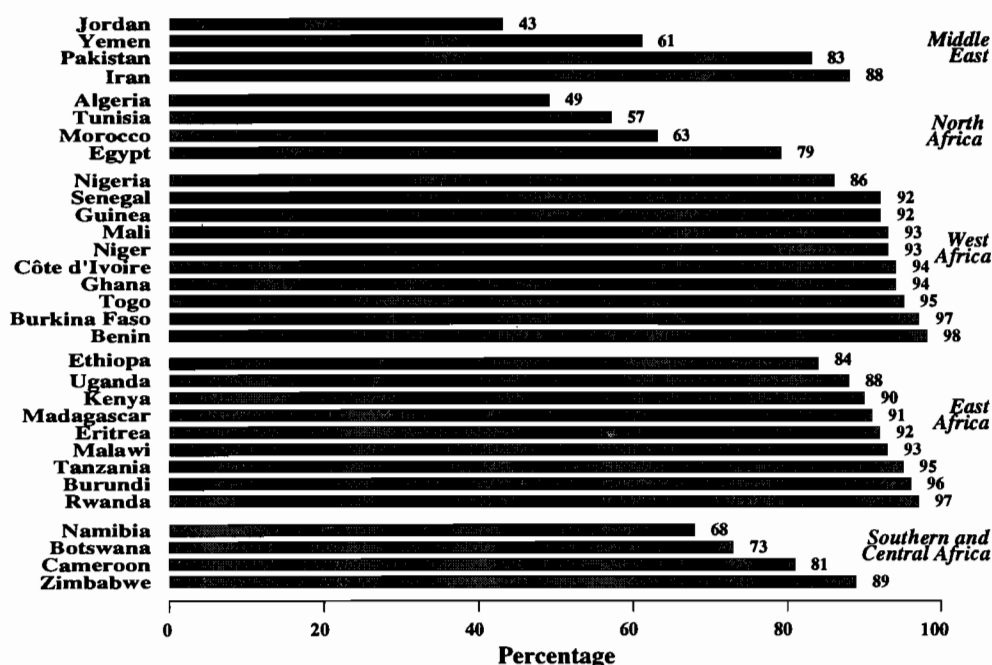


Figure 5
Continued breastfeeding rate at one year (children 12–15 months)

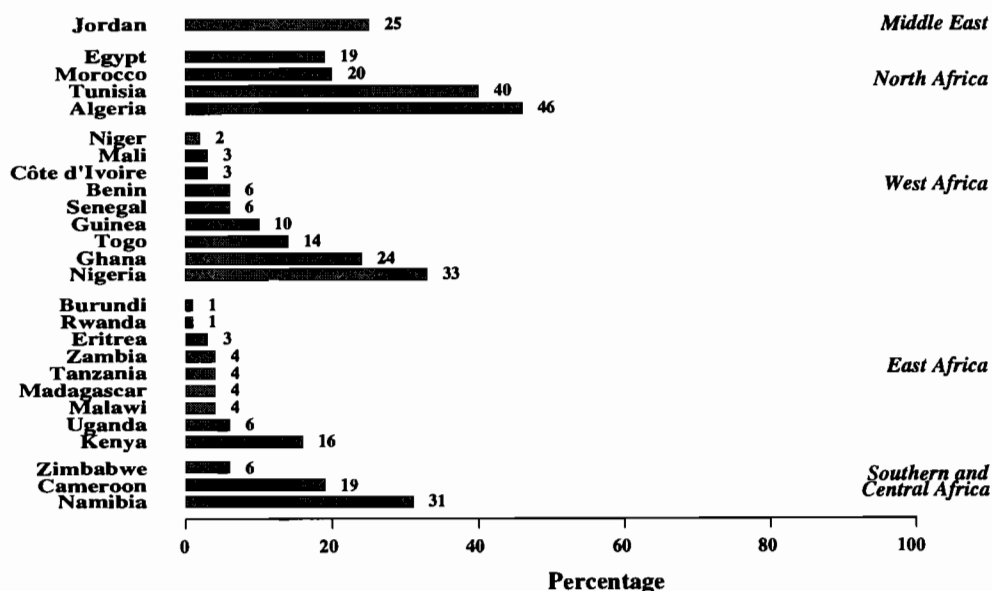


Figure 6
Bottle-feeding rate (among breastfed infants <4 months)

Nature and composition of first complementary foods in African countries

— Traditional porridge

The first complementary food given to African infants is a thin cereal porridge. In most cases, it is made of a single cereal, maize, millet or sorghum. In Sahelian countries of West Africa, porridge is usually made from millet. In Coastal West African states, from Côte d'Ivoire to Nigeria, maize is most often used. In Nigeria imported cereals, rice and oats, are also used. In Malawi, soya bean flour is added to maize flour. In Congo, a fermented maize paste is used to make porridge in the cities, while cassava porridge is prepared in rural areas.

Other ingredients may be added, often sugar, and cows' milk, fresh or fermented in pastoral communities (Ethiopia, Kenya, Tanzania, Mali and Niger), but this is not necessarily very frequent. In many countries, groundnut paste/flour or other legume pastes are added, but the frequency of use and amounts added are not documented. Animal products are not frequently added to porridge except in Nigeria (crayfish and periwinkle powder). In Tanzania, mashed potatoes and bananas are given to infants, and in Nigeria, fruit juice, vegetable soup and mashed vegetables with palm oil.

Fermented cereal porridge is used in many countries (e.g. fermented maize porridge in Nigeria, Ghana, Congo and Botswana, and millet porridge in West Africa).

The energy density is usually low because porridges are thin: energy density ranges from 30 to 90 kcal/100 g of prepared porridge. A very low energy density, approximately 30 kcal/100g, characterizes *ogi*, the traditional cereal porridge given to Nigerian infants (Brown et al., 1988). In Congo, the median energy density of gruel is comparable to that of breast milk, 60 kcal/100g (Trèche, 1999). Because energy density is low, the density of all key nutrients is also markedly insufficient. Only the protein density of the prepared gruel is documented; it is between 0.5 and 2.5 g/100 g.

When energy dense foods are added to the porridge, e.g. oil or groundnut paste, the energy density can be higher. In Nigeria, a porridge consisting of cereal, nuts and palm oil has an energy density of 115 kcal/100 g and a protein density of 1.9 g/100 g of porridge.

As the infant grows older, the porridge is gradually thickened. Thick porridges have a high energy density because their water content is low. In Tanzania a maize and groundnut thick porridge has an energy density of 130 kcal/100 g. The actual viscosity of such a porridge has not been measured. A high viscosity may limit children's intake of porridge.

The age of cessation of porridge consumption is generally not documented, with the exception of Congo where survey data show that the median age is 5.6 months in rural areas and 8.0 months in urban areas.

— Commercially available or distributed processed foods

Most processed foods, produced by large industrial units or by the cottage industry, are a mixture of a cereal staple and a legume flour (groundnut, soya bean, cowpea or chickpea flour).

In Ethiopia, the centrally produced *Faffa* consists of wheat flour, defatted soy flour, dry skimmed milk and pea flour, vitamins and minerals. The protein content is 21 g/100 g of dry mix. In Eritrea, DMK is produced from wheat, chickpeas and oil. The energy density of the

prepared gruel is 100 kcal/100 g of porridge. In Botswana, *Tsabana*, made from sorghum and soy, with vitamins and minerals, is distributed to all mothers of children less than three years of age. The energy density is 70 kcal/100 g of porridge and the protein content is 8 g/100 g of dry mix. The mothers are also given oil and advised to add some to the porridge to increase the energy density.

In Ghana, *Weanimix* is both a centrally produced mix and a household preparation, consisting of a roasted cereal and a legume (maize or rice, beans, groundnuts or cowpeas). The protein content is 11 g/100 g of dry mix. In Benin, *Ouando* is made from maize, sorghum and beans or soya beans. The energy density is between 40 and 70 kcal/100 g depending on how thick the porridge is. In Burkina Faso, *Misola* foods are produced by small-scale production units and by the community. They are made of millet, soya beans and groundnuts. The energy density is in the range of 60–70 kcal/100 g. In Malawi, *Likuni Phala* was introduced several decades ago. It is presently made of roasted or extruded maize and bean flour. The energy density is 79 kcal/100 g of porridge and the protein content is high: 3.2 g/100 g. In Uganda, the *Baby-soy* porridge is made of maize and soy flour with sugar. The energy density is 60 kcal/100 g.

Bitamin from Niger and *Vitafort* from Chad are based on a cereal, cowpea and groundnut mixture. *Musalac* from Burundi and *Sosoma* from Rwanda are made of two cereals and soya beans. *Nutrimix* and *Viten* in Togo are based on maize, sorghum and rice, with soya bean flour. The first formulation of *Vitafort* in Congo was the only food containing cassava, and *Actamine* in Morocco is the only one based on wheat (they both contain soya bean flour).

A review of experiences in the small-scale production of complementary foods in Africa is presented by Trèche (1999) in Chapter 4.

— Improved household preparations

In Ghana, in addition to *Weanimix*, two other preparations are promoted: *FRI-weaner*, a thick porridge made with maize, beans, groundnuts and milk; and *Tombrown*, made with roasted maize. In Benin, at Pahou, a variety of recipes are promoted for the preparation of porridge, sauces and purées.

Tanzania promotes the preparation and use of germinated cereal flour at the household level to reduce the viscosity of porridge. The energy density of a maize porridge with germinated sorghum is 100 kcal/100 g of porridge. A fermented porridge, *Togwa*, is also being experimented with.

A major constraint to the home-based preparation of improved complementary foods is the limited time mothers can devote to it. Where it is not a custom, it might be difficult for mothers to find the extra time to do it, especially in rural areas where women's workload is heavy.

Nature and composition of first complementary foods in Eastern Mediterranean countries

— Traditional foods

In contrast with the African countries, cereal porridge is not the main first complementary food given to infants in the Eastern Mediterranean. Nonetheless, cereal porridges and

puddings are used in many countries. They are rice-based in Egypt, Iran, Jordan, Pakistan, Palestine and Yemen, wheat-based in Egypt, maize-based in Egypt and Palestine, and made of other local cereals elsewhere.

Foods very often mentioned as first complementary foods are fruit juices, tea or herbal teas with bread or biscuits, vegetable soup, mashed vegetables and fruit. Dairy products, milk and yoghurt, are also frequently given to children; milk is given as a beverage with biscuits or added to porridge or pudding. In Jordan, sweetened carbonated drinks are mentioned, and there is a concern that children are receiving too much sugar. Other foods are given less often: eggs, cheese and legumes.

There is little information on the energy density of foods except in Egypt and Iran. In Egypt, *Mehalabia*, a maize starch and milk pudding with sugar, has an energy density of 130 kcal/100 g; a rice pudding is also prepared with milk and sugar. In Iran, rice based porridges or puddings are prepared with milk or sugar and almonds, with a respective energy density of 67 and 107 kcal/100 g and a protein density of 2 to 5 g/100 g.

— *Commercially available foods*

In several countries imported cereal-based foods for infants and young children are used: *Cerelac* in Egypt, Pakistan and Yemen, *Galactina* in Egypt, and *Farlac* in Pakistan.

There are several locally produced cereal foods. In Pakistan, *Farax* is an industrially prepared food made of wheat or rice. In Egypt, *Riri* is a partially pre-cooked wheat-based or rice-based food with skimmed milk and cacao.

— *Improved household preparation*

The Egyptian National Nutrition Institute has experimented and promoted several recipes for home preparation: *Arabena*, which is based on beans, chickpeas and wheat, lentils or rice; and *Sesamena*, made of wheat, lentils and sesame. Home processing techniques have been developed to improve the nutritional value of foods, through the chapati and germination techniques. Germination improves the digestibility and energy density of *Sesamena*.

Consumption of complementary foods before 4 months of age

Before the age of 4 months, infants should receive no foods or liquids other than breast milk. The consumption of liquids and foods decreases infants' intake of breast milk and exposes them to pathogens. In many countries liquids other than breast milk are given to infants. Moreover, in several countries, a noticeable proportion of infants are fed complementary foods before 4 months.

Although the number of countries where this information is documented is small, the data indicate that this harmful practice is widespread: the proportion of infants fed complementary foods before 4 months is especially high in Malawi (42%), followed by Togo (38%) and Zimbabwe (37%). In Benin, Cameroon, Kenya, Tunisia, and Zambia it is near 25%.

In Congo, complementary foods are introduced very early, at 0–2 months more than one third of infants have already been given complementary foods, in urban centres as well as in rural areas. In Palestine, qualitative data indicate that a large proportion of infants are already receiving complementary foods before the age of 4 months.

Median age of introduction of first complementary foods

Several African and Eastern Mediterranean countries have given estimates of the median age of introduction of first complementary foods. These must, however, be interpreted with caution as they are not the result of nationally representative surveys.

Among the few African countries that provided information, introduction is early: it varies between approximately 3 months in Malawi and Congo, and 5 months in Botswana. In the Eastern Mediterranean region, the age of introduction is somewhat later, with country medians ranging from 4 months in Jordan and Palestine, to 4.5 in Yemen, and to 6 months in Libya and Syria.

Preparation and distribution of first complementary foods

This information stems from qualitative studies and the values presented are merely indicative.

— Frequency of preparation

In Uganda and Ghana, porridge is prepared once a day for infants between 4 and 9 months. In Nigeria, a frequency of 3.5 preparations per day is reported at 4 and 6 months. In Malawi frequency increases gradually with age from 2/d at 4 months to 3/d at 6 months, and 4/d at 9 months. In Burkina Faso, porridge is prepared for infants once or twice a day.

In the Eastern Mediterranean region, only three countries have provided some information. In Libya food is prepared once a day for 4-month-old infants, while in Palestine a mean frequency of 1.5 times/d is reported. In Pakistan, frequency is higher with 3 preparations per day.

— Frequency of feeding

The number of meals given to infants is generally low in African countries, e.g. in Kenya (1/d at 4 months, 2-3/d at 6 and 9 months). In Tanzania, frequency is 2-3 from 4 to 9 months, and in Botswana and Ghana, 3/d from 4 to 6 months. In Congo, at 3-5 months, approximately two thirds of infants consume two meals of porridge per day. The highest frequency is reported in Nigeria (3-4/d from 4 to 6 months, and 4-5/d at 9 months).

In the Eastern Mediterranean countries, on the contrary, the usual number of meals is higher, 3/d or more at all ages. At 9 months, frequency is 3/d in Libya and 6/d in Palestine.

Use of imported complementary foods

Imported foods are more expensive than locally produced foods. In poor populations, there is a risk that infants fed imported foods will not be given sufficient amounts of these foods to satisfy their energy and nutrient requirements, because the foods are too expensive. It is difficult to estimate the importance of imported foods in comparison to locally produced complementary foods because consumption of the latter is unknown.

Data on acquisition and consumption of imported complementary foods were not available at country level. Nevertheless, the participants of the Alexandria and Addis Ababa workshops gave some indications on the level of consumption of imported foods in their country. Imported complementary foods are generally more available in the urban areas of developing countries than in rural areas.

In several Eastern Mediterranean countries, e.g. Egypt, Jordan, Lebanon, Libya and Palestine, imported cereal-based complementary foods are available, and their use is common. In Libya, it is estimated that imported foods represent approximately half of all complementary foods. Imported foods are available in Yemen but the level of consumption has not been estimated.

In most African countries and some Eastern Mediterranean countries (Pakistan), on the contrary, the use of imported foods is very limited. There are exceptions in Africa, for instance Nigeria, where more than 10% of complementary foods are imported. In the CFA Franc zone,⁵ the 1994 devaluation of the currency has made imported complementary foods much more expensive, and urban mothers have reverted to using local foods (Delpuech et al., 1996).

3.2 Solid complementary foods

Nature of solid foods in African countries

In almost all countries, solid foods given to infants and young children are taken from the family pot. In many countries the staple of the pot is millet, cassava, yam, plantain or rice, with a sauce of legumes (beans, groundnuts) or foods of animal origin (meat, fish). Nevertheless the amount of sauce given to young children is usually small. In Tanzania, a stiff porridge is used as solid food. At 6–7 months, only a small percentage of infants are given fish, meat or eggs in Eritrea and Mali (approximately 10%), and in Benin, Tanzania, Uganda and Zimbabwe (between 15 and 20%); in Zambia 42% receive animal foods.

The variety of foods given to young children is further limited by food taboos; there is a widespread taboo on giving eggs to infants and young children. In Botswana, meat is avoided because it is believed to delay teething.

Nature of solid foods in Eastern Mediterranean countries

In several countries, solid foods are prepared specially for children and a wide variety of foods are used: mashed vegetables, cereals or legumes with red meat, chicken or fish, eggs, and fruits (Egypt, Jordan and Palestine).

In some countries, children are fed solid foods mainly from the family pot (Yemen and Pakistan). Family foods can be spicy, e.g. in Pakistan. The variety of foods may be more limited when family foods are mainly based on cereals, e.g. in Yemen where staples are rice, sorghum and wheat. Bread or biscuits, with tea or dairy products, are again often mentioned. It is difficult to know how often and how much of these foods is given. Moreover, there may be large differences between rural and urban areas, as in Egypt, where complementary foods are usually not prepared specially for infants in the rural areas.

Median age of introduction of solid foods

The median ages reported by the participants of the workshops show that solids are introduced earlier in Eastern Mediterranean countries than in African countries, except in Libya (median

⁵ Communauté Financière Africaine (African Financial Community of French speaking countries)

12 months), but this difference could be an artefact, because the distinction between first complementary foods and solid foods is more difficult in Eastern Mediterranean countries (e.g., bread and biscuits are solid foods often used as *first complementary foods*).

In rural areas of Congo, family foods are introduced at about 6 months, i.e. at an age when infants should only be receiving their first complementary foods (Table 1).

Number of meals of solid foods per day

Information on the frequency of meals of solid foods was given by three Eastern Mediterranean countries, Libya and Yemen (3/day), and Palestine (3 main meals and 3 lighter meals). In African countries the number of meals of solid foods ranges from 1–2/d in Tanzania, to 2/d in Congo and Ghana, 3/d in Kenya, and 2–4/d in Nigeria.

Table 1
Median age of introduction of solid foods

African Region		Eastern Mediterranean Region	
Country	Median	Country	Median
	(months)		(months)
Rural Congo ^a	6.1	Palestine	4.0
Ghana	7.0	Jordan	4.5
Kenya	7.5	Egypt	5.0
Tanzania	7.5	Iran	5.0
Uganda	7.5	Pakistan	7.5
Urban Congo ^a	7.5	Libya	12.0
Nigeria	8.5		

^a mean age

4. CONCLUSION

This analysis clearly shows that distinct patterns of breastfeeding practices exist in Africa and the Middle East. Moreover, there are marked differences within regions, especially in Africa.

The two distinctive features of breastfeeding in West Africa are the low rate of early initiation, and the very low exclusive breastfeeding rate. Promotion of early initiation and of exclusive breastfeeding should be the first priorities of programmes for improving breastfeeding practices in this region.

A regional pattern is observed for the timing of introduction of complementary foods, although it is less clear-cut. In the Eastern Mediterranean region and in West Africa, introduction is generally too late, as shown by the low timely complementary feeding rates, with the exception of Iran, Benin and Togo. Rates are higher in Eastern, Central and Southern Africa — above 50% in all countries — except Eritrea. A high rate of timely complementary feeding, however, can be an indication that complementary foods are introduced too early;

this seems to be the case in several countries of Africa, e.g. Benin, Cameroon, Congo, Kenya, Malawi, Togo, Zambia, and Zimbabwe. Early complementation can cause a reduction in breast milk intake.

Feeding infants from a bottle is still uncommon in Africa, except in Nigeria and Namibia, whereas the practice is widespread in Eastern Mediterranean countries.

In Africa, the first complementary food is often a thin cereal porridge. The frequency of preparation is lower than the frequency of feeding porridge, implying that cooked porridge is stored to be served more than once during the day. The risk of microbial contamination is therefore high. Moreover, the energy density of traditionally prepared porridge is low, often lower than that of breast milk. Consequently, the nutrient density of porridge is also grossly insufficient. The frequency of feeding is generally too low to compensate for the low energy density of porridge. Quantitative data on children's intake are lacking.

The traditional porridge can be improved by the addition of locally produced energy-dense or protein-dense foods such as legumes, but more data are needed on the availability of these foods, their price and on the necessary home-based transformations, in particular whether they are labour intensive. Traditional food technologies using germination and fermentation should be studied with a view to improving and promoting them.

In some countries, important efforts have been made to promote the preparation of improved porridges, notably in Ghana and Tanzania. Many countries produce processed foods for infants and young children, but the level of production is limited in most cases. Both types of programmes — small-scale production and improved home-based preparation — need to be evaluated in terms of food quality, including their energy density, use, and impact on children's energy and nutrient intakes.

Solid foods are introduced early in the diet of African infants; the median age of introduction is less than 8 months. In almost all countries, children are fed solid foods from the family pot. The staple is very bulky, and amounts of other ingredients, such as legumes, vegetables and animal foods, are probably very small. There are again no quantitative data on young children's intake of solid foods. If the intake of porridge is maintained after solid foods are introduced, then the frequency of meals of solid foods (mean 2/d) is satisfactory. If, on the contrary, the consumption of porridge is discontinued, there is a risk that the children's energy needs will not be met.

In the more affluent Eastern Mediterranean countries, the situation of complementary feeding is very different. A wide range of foods are given in addition to porridge. Vegetables and fruit, animal foods and particularly dairy products, are often mentioned. Proper means of storing foods are more accessible than in African countries, and the risk of microbial contamination is lower. Processed foods, often imported, are more accessible. Nevertheless, some practices are inappropriate, such as the widespread habit of giving tea and bread, which could impair iron absorption. Moreover, in some countries special transitional foods are not prepared for infants traditionally, e.g. in rural Egypt, or the variety of foods is very limited, e.g. in Yemen; in these countries, the situation of complementary feeding is somewhat similar to that of the African countries.

In most Eastern Mediterranean countries, the solid foods given to young children are prepared specially for them. There is a large variety of foods and the frequency of feeding is adequate.

Nevertheless, in some countries the situation is not as favourable, as in Yemen, where children are fed a cereal staple from the family pot with insignificant amounts of other foods.

Efforts have been made in Egypt and Pakistan to produce special transitional foods. Improved household preparations have been developed and experimented with, and are currently being widely promoted in Egypt.

A standardized set of indicators for assessing complementary feeding is needed to help in designing and evaluating programmes for improving infant feeding. The development of standardized indicators is a difficult task because of the diversity of feeding practices between countries within a region, and between regions. As part of the Complementary Feeding Initiative, WHO's Nutrition Programme is committed to assisting countries in developing and field testing standardized indicators of complementary feeding.

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Complementary feeding

of young children in Africa and the Middle East



COMPLEMENTARY FEEDING OF YOUNG CHILDREN IN AFRICA AND THE MIDDLE EAST

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