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Report and analysis of an ethnographic study concerning the effect of food availability and infant feeding practices on the nutritional status of children 0-23 months.

by

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REPORT OF AN ETHNOGRAPHIC STUDY CONCERNING THE DETERMINANTS OF INFANT FEEDING PATTERNS IN NORTHERN CAMEROON (PROJECT: "EFFECTS OF FOOD AVAILABILITY AND WOMEN'S ACTIVITIES ON NUTRITIONAL STATUS OF CHILDREN 0 - 23 MONTHS.")

INTRODUCTION

The data reported here were gathered during the period from May to September of 1983 in a series of communities in northern Cameroon. A full census of households was carried out in four communities, selected to represent a range of variation in ethnic groups, living conditions, and nearness to the regional center of Maroua. From the household census data families were selected which had children under 24 months of age. A random sample of these children of 24 months and under. A random sample of of these households with small infants was then selected, of approximately 50 in each of the four communities. Ethnographic interviews were carried out in the selected households, by interviewers from the local region who could speak the relevant local languages. Due to problems of interview quality control(see appendix 1), data from the community of Mokong had to be discarded entirely, and a number of interviews from the other communities were also not used in the analysis. Approximately 28 families from each of the three communities--Meskine, Dogba, and Gawar were used in this data analysis. This is a sample size that is quite sufficient for the kinds of ethnographic observations projected here.

The ethnographic interviews in Dogba were carried out in a manner somewhat different from those in the other two communities. Hence only portions of the primary data are

reported in the aggregate for the three communities. Also, additional data from Dogba, which are not available for the other two communities, are given special attention below.

Data from ethnographic interviewing of the type described here is intended to provide hypotheses and guidelines to help in shaping practical progams in food and nutrition. The propositions below, based on both quantitative (statistical) analysis and descriptive, qualitative data, suggest a number of features of households and communities that are likely to be of great importance in any program for improving food use and nutritional status of the people in the region. The following statements summarize and highlight the findings from the ethnographic phases of the project:

1. Ethnographic interviews show that many people (mothers) in the region of northern Cameroon believe in, and practice nursing of infants for at least 14 to 20 months. Many breast feed for 2 years or more.

2. Practices with regard to giving complementary foods and breast-feeding vary considerably from one community to another, and especially within communities.

3. In general, the people do not believe in, or practice, giving substantial amounts of solid or semi-solid foods until breast-feeding is terminated, well into the second year of life.

4. Food complementation for nursing infants relies heavily on "bouillie"(gruel), usually made from millet, often quite thin and rather deficient in proteins and some vitamins and minerals.

5. A large number of infants who should be receiving substantial additions to breast-milk, (at least beyond the age of 6-7 months if not earlier), are receiving only "hot water," "millet-water", some "bouillie", and perhaps a bit of butter or cream. Some of these infants are also given thin "meat soup"(consomme), but this, too, is irregular, and low in nutritional quality.

6. A number of key factors appear to influence the levels of feeding practices, of which direct economic resources play a role, but in conjunction with many other, non-economic factors.

7. Some of the most important factors affecting infant feeding practices are: economic resources, family composition,(especially the number of wives), location in a particular community, mothers' work outside the home, nature of the father's occupation, and the ethnic/religious cultures to which the families belong. The value of animal herds also somehow influences infant feeding patterns, though it is not clear exactly what the pathways of influence might be.

8. The number of infant and child deaths are known to be high in the entire region, and ethnographic interviews in one of the communities (DOGBA) produces an estimated combined infant/child mortality rate of over 320 per 1000.

The differences from one community to another stand out as highly important in these data, and suggest that practical intervention programs should pay especial attention to the patterns of behavior and beliefs systems in communitiesand ub-regions, instead of seeking to apply programs in exactly the same manner, with the same tactics, everywhere in a region.

At the same time, it is also clear, from the ethnographic study, that there are important differences within communities, which place children at differential risk of poor health, at least in part as a consequence of poor feeding practices. In designing programs, planners should be alert to the possibility that other factors besides those discussed in this study may significantly affect program success.

THREE COMMUNITIES: MESKINE, DOGBA, AND GAWAR

One primary finding from the ethnographic interviews is that food availability, and food practices show considerable variation from one community to another. The reasons for such inter-community variations are very complex. It is a commonplace observation in development projects, food and nutrition programs, and other interventions, that some communities are "very receptive and cooperative"; others are "difficult." When there are clear ethnic differences between communities these overt cultural differences are of thought to be the sole, or primary, explanation for the contrasts between communities. On the other hand, when the communities are multi-ethnic, it becomes clear that the inter-community differences result from many other factors besides ethnic cultures.

Relationships to communications channels and to urban influences are often of considerable importance in causing contrasts between communities. In these ethnographic observations in northern Cameroon, the town of Meskine is very close to Maroua, and therefore can be regarded as "more cosmopolitan" or "more modern" in its degree of contact with forces and conditions of economic and cultural change. Dogba, some 45 minutes from Maroua, accessible by a partly paved, partly dirt roadway, is intermediate in degree of contact with "cosmopolitan influences." Gawar is the most removed, as it is some 3 to 4 hours by vehicle toward the western mountainous part of the region. Gawar is just as multi-ethnic as the other two, and has been settled by a variety of different peoples.

If distance, in terms of roads and other communications were the only factors, we would expect Gawar to be the "most different" and showing the least "wider world" influences, in comparison to Meskine and Dogba. However, Gawar has a sophisti cated agricultural development officer; a community health nurse is stationed there; and evidently there have been special development projects in Gawar from time to time. Thus, the histories of governmental (or other) programs and projects, plus differences in the characteristics of project personnel, have provided differential influences in communities such as these. Many other aspects of historical accident may also have left their marks in different ways in the communities.

The ecological contexts of communities also have very important consequences. Different crops due to different soil conditions; different possibilities for keeping animals; differences in water availability; differences in the kinds of social environments---nearness to particular ethnic groups; all have an important impact on the current cultural practices in rural communities. Some years ago an ambitious research project concerning personality factors and behaviors was carried out in East Africa, in which it was demonstrated that ecological factors associated with types of subsistence systems were in many respects more powerful than ethnic cultural differences in contrasting the various communities.

One important ecological factor is simply the size of the community itself, regardless of location. Very small communities have many fewer services, and usually much less occupational specialization than do larger centers. Both Meskine and Dogba--

each with something less than 1000 families--are large enough to accomodate a moderate division of labor, hence greater complexity of economic resources. Gawar is smaller, but is nonetheless an economic and political center. All three of these communities share a common denominator of relationship to the national system of Cameroon, and all three are in the savannah region served by the small city of Maroua. All three communities reflect a general cultural context in which the Islamic religion is a relatively dominant influence, with a minority of Christians, and with a considerable population of families who adhere to tribal religious traditions that for lack of a better term we will refer to with the somewhat awkward term, "pagan." The data indicate that the Moslems tend on the whole to be the economically more affluent households in the local communities.

Intra-community variations: economic resources

Just as there are important differences among the communities in the study, so, too, are there very significant differences within communities. Families are different in their composition, their social resources, their religious practices, and ethnic identifications. Probably the most important variations among the families in each community are their differences in economic resources.

The interviews provide a picture of the impressive variations in economic resources and materials style of life among different households. Despite the general poverty of the population, there is nonetheless a significant hierarchy of economic means in each community. In the community of Meskine, for example, at the wealthier end of the scale is a family with an automobile (age and make unspecified), in which the mother reports giving the baby milk, eggs, meat, and the interviewer reported that it was a "very clean home." Another fairly well-to-do (by local terms) family has a Suzuki, bicycle, radio, 7 wooden beds, 6 cows, 4 goats, 3 lambs, and a petroleum lamp. Many households have a bicycle for transportation, but at the low end of the economic scale are families such as one that reports only 1 chicken, no other animals, a wooden chair, 3 wooden beds, and a petroleum lamp. In the poorest families one encounters fairly frequent statements of "milk, bouillie and hot water" as the preferred feeding feeding pattern.(Reported as "yesterday's feeding" for a 12 month old child in one of the poorer families.)

In the statistical analyses that follow, we have used a measure of economic means that we label "Material Style of Life" (MSL). This measure, based on the economic value of the family's possessions, has been found to be an effective measure of economic status in anthropological studies in many parts of the world.

We will first discuss patterns of infant feeding, followed by presentation of a statistical analysis of the ethnographic interviews. The purpose of the latter is to make a "first approximation" of the factors that influence feeding patterns in

these populations. Because infants grow and mature so rapidly, their nutrient requirements also change very rapidly. In order to assess the adequacy of feeding practices in a qualitative fashion, or assess their nutritional status in a more precise manner, it is vital to know a child's age. In the study in Northern Cameroon this proved, as anticipated, to be a difficult problem. Therefore, before going on to discuss the feeding patterns, I will digress to discuss the issues involved in trying to establish precise ages of children.

Problems with Age of Children

In the northern Cameroon region, as in many other parts of the world, many people do not know their baby's birthdate, and their estimates of the child's age may be very rough approximations. This problem of accurate estimation of a child's age is most serious in relation to interpreting anthropometric measurements, which assume highly accurate age data, in order to interpret small differences in height for age and weight for age. However, these same problems about age estimates are also serious in relations to identifying patterns of change in infant feeding.

The interview data reveal that people of the region use a number of different ways to calculate, or estimate, the ages of their young children. In the first place, whenever interviewers asked people the ages of children, they readily provided the information. Unfortunately, such age estimates by the mothers have some serious inconsistencies. A number of mothers referred to the previous Ramadan as a "marker". Sometimes the age of the child did fit with "born a few weeks

before Ramadan", or "at the approach of Ramadan". In other instances the other data about the child do not seem to fit well with the earlier census data. That is, the age of the baby in the interview must be at least 2 months more than the age given in the census. In some cases, however, the age at the time of the census and age in the interview are clearly discrepant.

Fewer than half the mothers know the birthdate of their youngest infant. Some report the baby's birthdate as for example "the 15th of the month of Ramadan".... but since the month of Ramadan changes every year this cannot actually serve as a clear birthday marker in following years. About 60% report that they don't know the baby's birthday.

Many women report that they "calculate" the age of the infant "by counting from the first rainy season." This is quite inexact, and one also wonders what it is that they are counting. Others report that they count "with the moon". Others state that they count "according to the months."

The fact that people do not remember their child's birthdate is a clue to the likelihood that age in months is not a matter of great concern to the families. Therefore a statement such as "he is 17 months" appears to mean that 1) he is more than a year; and 2) he has some months to go before he is (approximately) 2 years old.

It is quite interesting, and important, to note the kinds of "natural events" and activities used to mark time periods. That is, to the question about the time of the child's birth, and to the question "how did you calculate the age of your

infant?" answers about time markers include:

1. Ramadan ("before", "during," etc.)
2. "after the entrance to the sorghum fields"
3. "three days after the feast of lambs"
4. "with the time of rain."
5. "the time of yellow millet harvest"
6. "following the work we do"
7. "there was a fight in the town"
8. "they repaired their roofs"
9. "during the ceremony of the Salak twins"
10. "during the harvest of red millet"
11. "ten days before the feast of May 20"
12. "there was a ceremony for a baby in the household"
13. "ceremony of my neighbors twins"

(note: #13 and #9 seem to be referring to the same event...yet one reports her child as 4 months , the other as 6 months...)

14. "time of the onion harvest"
15. "time when one cleans the fields of karal"
16. "the time of mowing"
17. "during the feast of Guiziga"

Several important features stand out in this list. First, it is clear that there is much attention to timing in terms of the annual work cycle. Second, the times of particular planting, of "the onion harvest", and other activities, can vary from one household to another, depending on the size of their holdings, the other work commitments of the household head, and other things. Clearly the calendar is different for the Islamic people than for the non-Islamic peoples. In fact, each different ethnic group has its own annual calendar of major activities, such as "the feast of Guiziga."

These ethnographic interviews, thus, provide a rich set of clues concerning the ways in which a "calendar of main events" could be constructed within each village, in terms of which the ages of children could be more clearly established.

PATTERNS OF INFANT FEEDING

It is now widely realized that there are serious problems in infant feeding in much of Western Africa, and the northern region in Cameroon is no exception. Although the ethnographic data give only a glimpse of the magnitude of infant mortality in the region, the numbers of households in the interview samples reporting one or more infant deaths suggest very high mortality rates in these communities. Of course, other factors apart from nutrition affect mortality, so the entire mortality picture must be understood in terms of the interactions among nutrition, infection, health care resources, and child care practices.

A pervasive pattern in the region is the relatively late introduction of solid foods. Young children are fed on "bouillie", which is a thin gruel, usually of millet. By itself, "bouillie" is not a strong means of complementary feeding, because it is neither high in calories nor in other nutrients. Some people add some butter or cream to infant diets, but in small amounts. The following examples from the interviews illustrate the general pattern of late introduction of solid foods, and the restricted diets of young children:

1. (Dogba) "some peanutbutter fritters, bouillie, millet-boiled water...first food not yet (baby is 17 months)"

2. (Dogba) "millet-water twice a day and nursing..one year old. Eats at 36 months."

3. (Dogba) "yesterday bouillie with peanuts, some meat, nursing...age 22 months. At 24 will replace nursing with bouillie."

4. (Dogba very poor family) "boiled water...she doesn't give her bouillie...13 months old .

5, (Meskine, poor family) "milk and hot water..because he is little. 12 months old"

6. (Meskine, moderately well-to-do) "milk and hot water..because the baby is so little...she can't eat yet. 9 months old"

7. (Meskine, moderately well-to-do merchant with 6 wives) "there are many foods you can't give to a baby such as potatoes and beans...because the baby can't eat well and he'll get diarrhea. Yesterday I made bouillie for my baby and I nursed him all day. 13 months old."

8. (Meskine, moderately well-to-do..has auto) "yesterday water, bouillie, meat, eggs and butter. 9 months."

The last two examples from interviews illustrate the fact that there are variations in feeding patterns among the somewhat wealthier families. From these examples we have a strong clue that economic resources influence what women give (or are able to give) their children. At the same time, we see clearly the evidence of beliefs about appropriate food for infants also affecting the kinds of foods that children receive or don't receive. Among the beliefs affecting infant feeding patterns are a series of food avoidances, which vary considerably from family to family, and which include statements about various foods that infants cannot or should not eat. One such belief is that "(solid) food will give him indigestion and it makes too much feces."

STATISTICAL ANALYSIS OF 57 FAMILIES

We examined in detail the interviews from 57 families from Meskine and Gawar, in order to identify possible predictive factors related to what can be regarded as "inadequate infant feeding". The assessment of the adequacy of infant feeding was based on the following conservative criteria:

1 to 6 mo. nursing, (hot water, bouillie OK)
7 to 9 mo. should supplement at least with meat soup,

butter, cream.

10 to 15mo. should receive some solid food

over 15 mo. should receive multiple solid foods

Approximately half the infants in the 57 households were judged to be receiving inadequate supplementation. We examined the correlations between a number of key variables and "inadequate feeding", with the following results:

TABLE I. CORRELATIONS WITH "INADEQUATE FEEDING"

NUMBER OF WIVES.	-.32
VALUE OF ANIMALS.	-.33
RELIGION (MOSLEM, "PAGAN")	-.22
WOMAN WORKS OUTSIDE HOME	-.16
MATERIAL STYLE OF LIFE (household possessions)	+.15
ETHNICITY OF HOUSEHOLD HEAD(Fulbe, Guiziga, other)	-.13
MAN'S OCCUPATION (cultivator or "other")	-.07

These correlations, although quite tentative, as they are based on a rather small sample, and only apply to the two communities, present a realistic picture and "make sense in relation to the other ethnographic observations. In the simple correlations given above, we note that (taken by themselves as variables) the strongest single "predictor" of poorer feeding practices is the situation in which a family has more animals. It is not an overwhelmingly strong relationship, but it comes through consistently in these data. Similarly, the families with multiple wives seem to have tendencies to feed their infants less well. Third in the list of correlations is that of religion--with a seeming advantage to the infants living in Moslem families (but see below).

The negative correlation between "women's work outside the home" and infant feeding supports findings from other parts of the world, in which households of low income, seeking to "make ends meet" through women's entry into the cash economy tend to have some negative effects on patterns of infant feeding. Of course this is a controversial

area, and the data in these interviews do not give enough information about the specific ways in which women's work and commercial activities affect infant feeding.

In order to look at these same variables to see their collective effect on "inadequate infant feeding" I did a multiple regression analysis with "infant feeding" as the dependent variable. In this statistical analysis we can see two important features: 1) the total predictive effect of the different variables; and 2) the special effects of particular individual variables in interaction with other variables. The following table gives a somewhat different picture from the earlier, individual correlations.

TABLE II. MULTIPLE REGRESSION:PREDICTORS OF "INFANT FEEDING"
(see Codebook of variables in Appendix)

	BETA
MATERIAL STYLE OF LIFE (hhld. possessions)	.93
NUMBER OF WIVES (one vs. more than one)	-.80
RELIGION (MOSLEM, "PAGAN")	.53
WOMAN'S WORK OUTSIDE THE HOME	-.53
VALUE OF ANIMALS	-.46
OCCUPATION OF HHOLD HEAD (Cult. or other)	-.46
ETHNICITY OF HHLD HEAD (FOULBE, GUIZIGA,OTHER)	-.45
COMMUNITY (Meskine or Gawar)	.29

When we try to look at the relationships of all the variables as a group in affecting infant feeding practices, we see that "material style of life" is a much stronger predictor than it was when we looked at the simple, pair-wise correlations. That is, families with more household goods--those who have cars or mopeds, for example--tend on the whole to feed their infants

with more solid supplements than do the economically poorer households.

The number of wives remains consistent in the analysis--families with multiple wives tend to be slower in giving adequate supplementation to the infants. Other variables controlled, it appears in these data that Moslem households are feeding their infants less adequately than are the "Pagan" households. Christian households were too few (4 cases), and are not included in the analysis.

Families with larger animal herds (cattle, sheep, goats) tended to have poorer supplementation practices, according to these data. This trend is evident in the simple, pair-wise correlations, and comes out just as clearly when we have the whole cluster of variables acting together.

The ethnic variable appears to indicate that Foulbe tend to give more food supplementation to their infants than do the Guiziga and the "other ethnic groups" (Moufou, Dimeo, Mandara, Gadala, and others). Thus, the Moslem families who are not feeding their children as effectively would appear to be non-Fulbe Moslems.

The household head's occupations were coded as "cultivator" or "other," in which it was judged that all the "other" occupations were of higher socio-economic status--"merchant, "professor" "local political officer," "chauffeur," etc. The statistical analysis suggests that there is some way in which the non-agricultural occupations are a negative effect on infant feeding adequacy, other things being equal. We note that this is a somewhat paradoxical effect--in the same way that

women's entry into commercial activities has a paradoxical effect. Higher wage-earning should serve to raise the family's socio-economic status--and higher socio-economic status means better infant feeding, on the whole. However, if we remove (statistically) the positive effects of the higher material style of life, then there is the unfortunate negative association between higher occupational status and infant feeding patterns.

The "community variable" suggests that there is some sort of contrast between Meskine and Gawar. If we assume that the difference is in contacts with Maroua and thus degree of "modernization", with Meskine representing a "more modern" environment, compared to the semi-isolation of Gawar--then we have the unfortunate possibility that the "more modern" community of Meskine tends to have poorer infant feeding practices.

When we turn our attention to peoples' stated ideals concerning supplemental feeding of small children we are able to clarify somewhat the results above. Women were asked "What foods do you prefer to give to your child under 24 months? For what reasons do you prefer to give these foods?" The answer to this question does not depend so squarely on peoples' economic means, since the question concerns preference rather than actuality.

The following table gives an interesting picture of inter-woven economic and cultural variables. The dependent variable, "beliefs about adequate infant feeding", was coded from 1 to 5, in the same way as the behavioral variable.

TABLE III. PREDICTORS OF BELIEFS ABOUT ADEQUATE INFANT FEEDING

	BETA	(SIMPLE R)
WOMAN WORKS OUTSIDE HOME	-.64	-.21
MAN'S OCCUPATION	-.40	-.03
MATERIAL STYLE OF LIFE	.49	.12
NUMBER OF WIVES	-.32	-.06
COMMUNITY	.35	.30
VALUE OF ANIMALS	-.19	-.26
MOTHER'S ETHNIC CULTURE	.08	.31

MULTIPLE R= .59 R-SQUARED = .34

This time the effect of the woman's working outside the home is, curiously, even more striking than in the statistics concerning current feeding practices. Also curious is the fact that the man's higher occupational status tends toward a less adequate cultural pattern of food complementation. The effect of actual material style of life--the household economic resources--is in the predictable direction, but not quite as strongly as is the case with that actual feeding pattern described earlier. The presence of plural wives does enter the picture, but again not nearly as powerfully as in the actual feeding.

The "ethnic variable" as a key element in predicting ideal infant supplmentation practices seemed at first to be quite important, mainly because of the special attitudes of the Guiziga, who happen to be more numerous in Meskine than in Gawar. They state that they prefer to delay feeding of solid foods until the baby is weaned, usually after two years of age. One older Guiziga male told me that "When I was young the babies didn't get anything but breast milk until they were 3 years old; now they get some other foods when they are younger." The Guiziga pattern

of infant feeding, especially in earlier times, represented an extreme reliance on breastmilk alone. The Fulbe, adapted to life in the savannah environment, are apparently not as extreme as the Guiziga in their delay of introduction of additional foods, but they, too, have a number of small children who receive few solids until well past the first year.

The seemingly more effective infant feeding practices in the community of Gawar, more isolated and less "modern" than Meskine, is possibly due to the traditional practices of the various ethnic groups from the mountainous areas in the western part of the region. A large number of different ethnic groups are found in Gawar; no one particular cultural group stands out. The data from these ethnographic interviews would seem to indicate that the infant feeding patterns in the mountainous regions have traditionally been quite different from those of the savannah groups like the Guiziga.

Contrasts between Meskine and Gawar

We have focussed on the differences and similarities between Meskine and Gawar mainly as they represent respectively the "more cosmopolitan" and the "least cosmopolitan" of the communities. Meskine has more Moslem families in the sample; and the Meskine sample has mainly Fulbe and Guiziga families, while the Gawar sample is dominated by a variety of other ethnic groups--Dimeo, Kapsiki, Mafa, Bao, Gadala, and others, many of which are traditionally from the mountain environments to the west.

The following table graphically illustrates the differences between Gawar and Meskine in their answers to "what foods do you prefer to give your child under 24 months?"

TABLE V. PREFERRED FEEDING FOR INFANTS UNDER 24 MONTHS

	MESKINE	GAWAR
1. only water, bouillie, milk:	10	3
2. plus some butter/cream	5	0
3. plus some meat soup	2	6
4. mention meat, fritters, fish, sauce, eggs	6	12
5. at least 2 kinds of item 4	5	4

Chi Square = 12.75 $p < .002$
Gamma = .36

In addition to the fact that the people in general feed their children better (or at least complement with solid foods earlier in Gawar than in Meskine), the ethnic group that seems particularly contributing to the low end of the supplementation scale in Meskine (Guiziga mothers), are not following the same kinds of infant feeding practices in Gawar. Evidently the Gawar social environment favors a general pattern of more ample supplementation, regardless of the ethnic culture.

A rather striking difference between Meskine and Gawar is seen in the reply to the question: "Are there certain foods that you prefer to eat during pregnancy?" Many more Gawar women reported that they wanted to eat fruit during pregnancy. The table shows this interesting difference between the two communities.

TABLE VI. FRUIT PREFERENCE DURING PREGNANCY

	MESKINE	GAWAR
Mention fruit:	5	14
No mention of fruit	21	13

Despite the greater numbers of families in Gawar that profess a traditional tribal ("pagan") religion, on examination of the interviews we found that the mention of fruit as a suitable pregnancy food was mainly among Moslems--apparently Moslem families from the non-Fulbe cultural groups.

There was also a contrast between Meskine and Gawar in certain kinds of food restrictions. More Meskine women, particularly Guiziga, reported that they avoid manioc, both during pregnancy and in lactation. On the other hand, several of the women in Gawar reported that they avoid eggplant (aubergine), and they also a number of other avoidances (baobab, gombo, peppers) which were not reported by women in Meskine.

Another interesting food restriction prevalent in Gawar, but not in Meskine, is the avoidance of sweets, sugar, sugarcane, and honey by pregnant women. A few of the Gawar women also reported that they avoid giving sweets to their babies. Only one Meskine women reported such an avoidance of sweets for infants. The following table shows the dramatic difference between the two communities in women's avoidance of sweets during pregnancy:

TABLE VI. AVOIDANCE OF SWEETS DURING PREGNANCY

	MESKINE	GAWAR
Mention sweets avoid.	7	21
No mention of avoidance	21	6

Chi Square = 13.3 p< .0001
Gamma = .83

This striking difference between the two communities had no relationship to the religion of the women, and was not accounted for by differences in socio-economic status.

There are a number of other differences between the two communities that appear in the interview data. These differences are mentioned to point out that certain general ecological features of different communities may affect whole patterns of behaviors. In Gawar, for example approximately half the household heads had multiple wives. In Meskine only one third of the families were polygynous. This difference is important, when we consider the apparent effect of multiple wives in apparently somewhat depressing infant complementation behavior.

Another very significant difference is the fact that Meskine families have much larger herds of animals than do the people in Gawar. Despite these differences in numbers of animals, there were no significant differences in materials style of life--the household economic resources--between the two communities. Table VIII shows the differences in animals holdings. I devised a system of weights, whereby cows and horses were given a weighting of 5, sheep and goats 3, and chickens or other small creatures 1. This system does not do full justice to the real differences in value between these animals, but it

serves as a fairly effective indicator of relative differences in animal wealth.

TABLE VIII. VALUE OF ANIMALS HERDS BY HOUSEHOLDS

	MESKINE	GAWAR
High animal values	11	8
Low animal values	5	20

Chi Square = 5.16 $p < .01$
gamma = .69

The wealth in animals, as noted above, appears to have a negative effect on infant feeding practices. This is particularly interesting, in that animal wealth is quite strongly correlated with material style of life indicators in both the communities. Thus, of the families low in animal resources, 23 of them are also low in material style of life. Of the families that are high in material style of life, 80% are also high in animal wealth. Thus household organization in families with more animals has a negative impact on infant feeding even though these families with animal wealth also have other types of economic resources as reflected in higher MSL scores.

Concerning food avoidances for their infants under 24 months, several of the Gawar women reported that they avoid food that is "spoiled", "not properly cooked", "left out overnight." These kinds of avoidances were not part of the food avoidances for infants in Meskine.

DOGBA: A DIFFERENT COMMUNITY

I have reserved Dogba for separate discussion for two reasons. The interviews carried out in Dogba were somewhat different from those in the other two communities. Only parts of the data are compatible. Perhaps more important, the community of Dogba seems quite different from the other two in their child feeding practices and in a number of other respects. Like Meskine and Gawar, the Dogba sample has approximately one third Moslem families, a slightly smaller number of families with traditional religions, and six Christian families. There is a Seventh Day Adventist compound at Dogba, with a fairly well-kept dispensary, a school, and the church. Some of the Dogba people are employed at the compound.

Dogba has only 7 Fulbe family heads in the sample, and only 3 Guiziga--hence the sample, and presumably the population is even more heterogeneous than the other communities, for none of the 15 or so ethnic groups (other than the Fulbe) account for more than 2 or 3 households each. The infant feeding pattern in Dogba seems extreme. At first glance the pattern of "ideal food for the child under 24 months" does not seem so different from the other communities. We see the range of variation in the following table:

TABLE IX. IDEAL FEEDING FOR CHILD UNDER 24 MONTHS: DOGBA

	NO. OF MOTHERS
1. water, bouillie, milk	9
2. plus some butter/cream	2
3. include meat soup	3
4. some solid food	9
5. more than one solid	3

What makes this pattern more extreme than in the other two communities is the fact that a large number of the Dogba children were between 15 and 24 months of age at the time of the interviews--an age at which many nutritionists would argue that the child should receive a variety of solid foods. Over half of the infants (16) were reported to be over 16 months old at the time of the interview! Thus, in my judgement concerning "adequate infant feeding," I rated only 7 of the 29 cases as "adequate" or positive--almost all of those 7 cases were in very young children.

Four of the seven were Moslem families.

There were a number of mothers who reported that their babies receive their first solid food when they stop nursing. Some of these cases from Dogba provide a dramatic picture of delayed introduction of solids:

> "at 20 months stops nursing and begins to drink bouillie with peanuts and ripe fruits. (Guiziga family)
>
> "stops nursing, and first foods at 17 months" (Maquinmiaun woman)
>
> "19 month old---receives bouillie, cold water and breast milk...will stop nursing now..." (Montourona family)
>
> "18 month old--receives yellow-millet bouillie, boiled water and milk. stopped nursing at 14 months (Christian, Zoulgo family).
>
> "one year old...wealthy family...receives millet water and nursing" (Moufou mother)

"two- year old...receives breast milk, millet water, and some of the family's regular food. will stop nursing at 30 months." (Nguilbada (pagan) mother).

"two-year old...nurses until 36 months...then replaces with bouillie." (Guiziga mother)

"bouillie at 3 months and meat soup at 17 months...13 months, stops nursing.." (mother is Christian Markaba).

CHILD DEATHS IN DOGBA: INDICATOR OF POOR NUTRITION PRACTICES?

In the interviews in Dogba the mothers were asked to recount the total number of pregnancies, numbers of miscarriages, deaths of children, and currently living children. The data from this part of the interview are very disturbing, for they show a total of 49 children born alive, but not now living. From a total of 154 live births, this gives a rate of approximately 32 % child-loss. Since interviews concerning infant and child deaths are generally subject to serious under-reporting, I would conclude that the infant and child death rate is even higher than that recorded in this small sample. Since the sample was drawn as a random sample from a census of households in Dogba, it does not appear likely that some systematic bias was introduced in the interviewing.

I tallied a total of 12 families in which more than one child death was reported. The cross-tabulation between "child deaths" and "adequate supplementation" is given in the following table:

TABLE X. "EXCESSIVE CHILD DEATH" AND "FEEDING PRACTICES"

	0 OR 1 CHILD DEATH	2 OR MORE DEATHS
"ADEQUATE CHILD FEEDING"	6	1
"NOT ADEQUATE CHILD FEEDING"	11	11

(gamma -.49)

The sample here is too small for the statistical computation to mean very much in predicting the characteristics of the entire population, but one is struck by the fact that those few families in which feeding practices are more adequate appear to have fewer child deaths. Of course a number of other factors apart from nutrition also affect infant and child mortality, including diarrhea, malaria and other diseases. In exploring the small sample for possible other clues concerning the rates of infant/child deaths in Dogba I noted the negative impact of plural wives as a possible contributor, as we see from the following table:

TABLE XI. INFANT/CHILD DEATHS IN RELATION TO PLURAL WIVES

	NO DEATHS	1 DEATH	2 OR MORE DEATHS
ONE WIFE	8	3	4
PLURAL WIVES	3	2	6

(gamma = .48)

WOMEN'S WORK AND MORTALITY

The tentative generalization seen in the Meskine-Gawar data, concerning the possible negative effects of women working outside the home, is re-inforced by the Dogba ethnographic interviews. In that community 9 of the women report working for money, particularly in preparing and selling "bil-bil", a millet-beer. The following table shows the relationship between such entrepreneurial activity and the data on infant/child mortality in the households.

TABLE XII. WOMEN'S WORK OUTSIDE THE HOME AND MORTALITY

	ONE OR NO INFANT/CHILD DEATHS	2 OR MORE DEATHS
WORK AT HOME AND FIELDS	15	4
EARN CASH IN BIL-BIL OR OTHER SELLING	2	7

Gamma = .55 Chi Square significant at .02

We do not, of course, learn from these interviews about the actual causal factors that adversely affect the infants and children of the women who seek income through these entepreneurial activities. In some other studies it appears that women may be leaving small children in the care of their older sisters and brothers during the day as they go off to marketing activity. Any practical intervention program should pay especial attention to the infant-feeding behaviors of the mothers as they go out to work--including field work.

The data on child mortality in Dogba do not appear to be related to either the material style of life or the value of animal herds. The material style of life table (below) is practically duplicated by the "value of animals" tabulation.

TABLE XIII. MATERIAL STYLE OF LIFE AND "EXCESSIVE MORTALITY"

	ONE OR NO INFANT/CH. DEATHS	2 OR MORE DEATHS
OWNS AUTO OR MOTO	4	3
NO MOTOR VEHICLES	12	8

(Gamma = -.14) N. S.

Although we do not have infant/child mortality data from the families in Meskine and Gawar, these data strongly suggest that the patterning of infant/child deaths is related to the pattern of "infant feeding inadequacy." That conclusion is not in itself surprising. What is perhaps more important in the data above is the possibility that several of the factors indentified in connection with "inadequate infant feeding" are powerful enough to be identified even in a small sample in a single community.

CONCLUSION

Throughout the discussion above I have tried to emphasize that the data presented here are only tentative, and should serve more as guidelines for practical programs (and hypotheses for further research), rather than as hard-and-fast "conclusions." The risk factors identified in these materials can be used to develop an "index of risk" for each small child in communities affected by a food/nutrition program. In addition, it is strongly suggested that workers in particular communities and sub-regions modify and amplify such "indices of risk", using information gathered in the specific communities; in certain respects it would be expected that the profile of significant risks would differ from one community to another.

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COMPLEMENTARY FEEDING OF INFANTS IN NORTHERN CAMEROON.
(Data from communities of Meskine, Doŋba, Gawar, 1983)

AGE OF INFANT		"BOUILLIE"		BUTTER / CREAM		SOUP		ANIMAL MILK		MEAT/EGGS FISH/OTHER SOLID FOOD	
	#	no.	%	no.	%	no.	%	no.	%	no.	%
0--6mo	(10)	5	28%	5	28%	0	0	1		0	
7-9	(9)	5	56	1	11	1	11	0		4	44
10-12	(11)	6	56	1	9	1	9	0		4	36
13-15	(13)	9	75	1	8	2	17	0		5	42
16-18	(12)	11	92	1	8	1	8	2	17	5	42
19-21	(8)	6	75	3	38	2	25	2	25	6	75
22+	(7)	7	100	0	0	0	0	2	29	5	71