Kenya Policy Brief:
Feeding Infants and Young Children in Kitui County

Gretel Pelto and Faith Thuita

Audience

This policy brief is for policy makers, program managers, researchers, and other professionals dealing with nutrition, health, community development, and social and behaviour change and those with an interest in maternal and child health and development in Kitui County.

Purpose

There is increasing recognition of the need for implementation research that is designed to provide context-specific information and data to inform decisions for planning nutrition and public health interventions. This brief provides evidence for decisions to improve maternal and young child nutrition derived from a systematic landscape analysis in the county.

1. Introduction

This policy brief summarises key results from a study designed to identify potential interventions to improve nutrition in infants and young children in Kitui County, Kenya. The study was commissioned to provide information necessary for the design of appropriate high-impact nutrition interventions in Kitui to improve nutritional outcomes at the household level.

The climate of Kitui County varies between arid and semi-arid, with very erratic and unreliable rainfall. Most of the area is hot and dry. The limited availability of water, coupled with poor soil fertility, presents major challenges for crop cultivation. More than a third of the county's residents reside in the marginal mixed farming regions, which rely largely on livestock for food (milk and other products) and revenue. However, the livelihood system is beset by high vulnerability to recurrent and prolonged droughts, lack of water and pasture, high livestock mortality, and repeated crop failures. The low-lying eastern and central areas of the county are also prone to flooding. The study was conducted in selected communities in the four divisions of Kitui Central (Tiva), Lower Yatta (Kalunini), Mutomo (Mwamba), and Mutonguni (Musengo).

Two research approaches were used in Kitui County:

- Ethnographic research was conducted using the GAIN-initiated Focused Ethnographic Study of Infant and Young Child Feeding Practices (Pelto and Armar-Klemesu 2014).
- A dietary assessment and an application of Optifood, a linear programming software tool

An FES applies well-established ethnographic methods to obtain data from caregivers on determinants of dietary practices, including social, economic, cultural, technological, and environmental factors (Pelto et al. 2012). This research approach uses sampling procedures that ensure representation of economic strata

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and age sub-groups of infants and young children 6–24 months of age. Optifood is a research tool that uses data obtained from dietary intake measurement to reveal the strengths and weaknesses of current diets. It identifies locally appropriate food-based modifications to improve dietary adequacy, taking into account local dietary norms, food use practices for infants and young children, and associated constraints (Ferguson et al. 2006). These two approaches combined are used to identify context-specific opportunities and limitations for dietary improvement through behaviour change interventions (Hotz et al. 2015).

2. Overview of the Situation: The Importance of Nutrition in Infancy and Early Childhood

Adequate nutrition is essential to growth, health, and development during infancy and early childhood. Under-nutrition, which in addition to being the result of inadequate diets, is also influenced by hygienic practices, health provision, and care, is an underlying factor in 45% of child deaths (Black et al. 2013). The immediate consequences of poor nutrition during the early formative years include significant morbidity, mortality, and delayed mental and motor development. In the long term, early nutritional deficits are linked to impairment in intellectual performance, decreased work capacity, and poorer reproductive outcomes and overall health during adolescence and adulthood. The '1,000-day window'—the period from conception to a child's second birthday—is a critical time frame for the promotion of optimal growth, health, and behavioural development (World Health Organisation [WHO] 2010).

IYCF practices are a major determinant of child nutritional status outcomes. Optimal IYCF practices include exclusive breastfeeding for the first 6 months and appropriate complementary feeding from 6 months through at least 2 years, and continued breastfeeding to 2 years of age or beyond. Appropriate complementary feeding includes timely initiation of solid/ semi-solid foods from 6 months of age; increasing the amount, density, and variety of foods; increasing the frequency of feeding as the child gets older; responsively feeding the child; and ensuring that good hygiene practices are used in preparation and feeding, while maintaining breastfeeding.

IYCF practices in Kenya are currently less than optimal. Only 25% of young children are fed adequately diverse diets (Kothari and Abderrahim 2010). In previous research, caregivers, families, and communities in Kenya have been reported to lack up-to-date knowledge of optimal IYCF practices, particularly during the complementary feeding period (Thuita 2008; Nduati et al. 2008; Israel-Ballard et al. 2009). Improving complementary feeding practices amongst Kenyan children aged 6–23 months could significantly contribute to improved child survival, health, and development.

3. Overview of Methods

To assess current practices and identify potential interventions to improve nutrition in infants and young children, researchers used the FES manual and protocols (Pelto and Armar-Klemesu 2014). Each protocol consists of a set of modules, which are administered through in-depth one-on-one interviews. The modules are designed to explore a range of issues, including foods for infants and young children, food preparation and feeding practices, sources of food acquisition and food expenditures, types of problems faced by parents of infants and young children, food and nutrition problems

of infants and young children, perceptions about health and food, and perceptions about micronutrient supplements and fortification of infant foods. The modules' open-ended questions were administered with extensive probing to expand and interpret the initial responses. The nutritional assessment of IYC diets was done via a cross-sectional dietary survey and analysis using Optifood software (Ferguson et al. 2015).

4. Results

Infant and young child diets

In Kitui, breastfeeding rates from 6-23 months are high. All mothers reported that the index child was initially breastfed and all but 2 of the 32 children aged 6–23 months were breastfed at the time of the study. However, analysis of the current diets of infants and young children showed that they are inadequate in many nutrients.

The majority of children consumed porridges (based primarily on unrefined maize flour and secondarily on the preferred grains, i.e. millet and sorghum). The most common accompaniment to these staples was the broth from vegetable stews. Milk, as a separate beverage, was consumed by many children, but tended to decrease in the second year of life. Few children consumed animal flesh foods (0%–2%) or fresh fruits (8%–9%).

The limited number of foods commonly consumed by children in Kitui was reflected in low dietary diversity scores, which is a general measure of the quality of the diet. Fewer than 25% of children achieved the minimum dietary diversity of 4 food groups or more for children 6-23 months of age (WHO 2008). The nutrient density in the infant and young child (IYC) diet, another measure of dietary quality, was often low. The nutrient densities of diets of children 6–8 months old were below WHO desired levels for 8 of 10 key nutrients examined (the exceptions being vitamin A and vitamin C). For the age sub-groups in the 9–23 month range, nutrient densities were below desired levels for 7 of the 10 key nutrients. The most serious problem nutrients were iron and zinc in all age groups and vitamin B12 in the 12–23 month age group, after accounting for estimated breastmilk intakes (Ferguson et al. 2015).

Increased frequency of feeding specific, locally available foods could go a long way in filling nutrient gaps in the IYC diet. This includes consumption of animal milk three times a day every day (added to porridges so as not to encourage displacement of breast milk); green leafy vegetables, millet, and a fortified cereal once a day every day; legumes one or two times a day every day; and meat, fish, or eggs three times per week.

While incorporating these changes into current diets would allow infants and young children to meet their requirements for nine nutrients (6–11 months) or seven nutrients (12–23 months), after accounting for estimated breastmilk intakes, adequate intakes of iron, zinc, and calcium would be difficult to achieve, and additional solutions are required to increase access to good food sources of these nutrients beyond current food use and dietary patterns (Ferguson et al. 2015).

Food acquisition for infants and young children

The results indicate that not only do caregivers generally access foods through markets, but several food items used specifically in IYC diets are obtained primarily from markets. None of the families in the study produced all of the foods that they needed to feed themselves and their children. The amount of time that they could rely on home-produced staple foods varied, but was never more than a few months at best.

The preferred grain for infant porridge is millet, which is almost always made from a commercial source, either a branded product or a generic flour. Other commercially produced, multi-grain porridges are also given to infants and young children. When millet porridge is not available, maize flour porridge is given. The maize flour may be purchased or comes from milling home-produced maize or purchased maize.

Caregivers' nutrition knowledge

One important finding is that caregivers generally have sound nutrition knowledge about feeding infants and young children. They have acquired this from many sources: school, medical professionals at health clinics, and community health workers. Most importantly caregivers are aware of and strongly committed to the idea that what children eat affects their growth and their health. Their knowledge accords well with contemporary thinking about IYCF.

> 'As far as I am concerned, giving quality food is all that is needed to keep a child healthy. If a mother gives quality food, the child will grow well and when taken to the hospital for weighing, the nurses will tell you that the child is growing well'.

A small minority of the randomly selected respondents were highly knowledgeable; the quotation below was elicited in response to an interviewer's question about whether the caregiver had ever heard of vitamins:

> 'There are different types of vitamins—A, C, D—which help prevent the baby from illness. If the baby is safe from infection, she will generally be healthy, and I will feel good. In my view, the type of diet the baby eats will make the baby strong'.

For the most part, cultural beliefs are not preventing caregivers in Kitui from using affordable nutritious foods that are available in their environments. However, fish is not seen as a desirable food for anyone and is not given to infants and young children. Traditional foods are widely regarded as inadequate nutritionally and are given only because women have no choice. *Githeri* (the mixture of whole maize and beans that is a family food staple) is regarded as particularly bad because it is difficult for children to chew. A few caregivers spontaneously suggested that soda and commercial, reconstituted juices are also not good.

There are major gaps between what caregivers want to feed their infants and young children and what they are able to give them. Mothers would like to feed cereals that they regard as nutritious. Much of the time they are forced by lack of resources to feed plain maize porridge, a food that they have been taught is nutritionally inferior.. Even the addition of milk is not seen as raising the 'healthiness' value of maize porridge to that of millet porridge. Millet, on the other hand, is viewed as a food of high intrinsic nutritional value.

Hygiene and food safety

Another important positive finding from the study is that caregivers have well-developed ideas about food hygiene and the importance of protecting food from contaminants. They are aware of and concerned about personal hygiene, food hygiene, and food safety. They attempt to give their children both nutritious and safe food. However, their preparation and storage practices may still put children at risk of food-borne diseases because they do not have sufficient and consistent access to the technology that helps ensure food safety.

Caregivers prepare food over wood fires that require substantial efforts, both to acquire firewood from the surrounding countryside and to build and maintain the fire. Consequently, they cannot easily prepare or reheat food for their children on a schedule to meet children's needs, which means that prepared foods have to be stored for many hours without benefit of refrigeration that would prevent growth of pathogens.

> 'I cook multiple portions because I have a thermos flask to store the porridge. The thermos flask keeps the porridge hot.

> When the baby wants to feed, all I do is just give it to her. The flask is placed on the kitchen table, a raised surface to keep from breakage or from anything else'.
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> 'I always make multiple portions because I have no time to prepare it when the child needs to feed. Besides, I am leaving him with neighbours, thus I have to leave food for him'.

While the picture with respect to caregiver knowledge and practice is generally favourable, there were two areas of weakness that emerged from the study:

- The use of black, sugar-sweetened tea, often served without milk, is a frequent dietary component. Caregivers prepare this in the morning and store it in thermos bottles or other containers, so that it is handy to feed during the day, in response to child thirst. It is also left to be fed by alternate caregivers when mothers are away.
- Food is commonly stored under unsafe conditions after its initial preparation.

For both of these findings, the results indicate potential problems, but they do not provide definitive evidence of adverse effects on IYC nutrition and health. Further studies are required to confirm this.

The dual problems of fuel and water

Collecting firewood and fetching water are major time- and energy-consuming household management tasks for women in Kitui. These two fundamentally important responsibilities compete for time to engage in other, equally essential activities in agricultural production; income-earning activities; and child care, including feeding and food acquisition and preparation.

The competition for women's scarce time is particularly acute in the dry season when there is a heavy need for them to engage in income-earning activities to purchase food. It is further exacerbated by the scarcity of water, which is critically important because it directly affects IYC nutrition.

> 'All the harvest is finished, so we have to buy all the food. During these months water is also a problem. The rock catchment gets its water from the rains. It dries up during these months and we have to travel for about 2 hours to get water from the traditional wells'.
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> 'The water situation is so bad that sometimes people do not eat because there is inadequate water. Though food may be available in the household, there is completely no water to cook the food. We are forced to go look for water very far. Sometimes we fail to find water and people are forced to sleep hungry'.

Technology and infrastructure solutions are required to relieve these additional, underlying stresses working against adequate child nutrition both indirectly, through mothers' time constraints, and directly, through the ability to cook food.

Food insecurity

Food insecurity is a widespread concern and common and escalating problem for caregivers in Kitui throughout the year, not just during the dry season. The majority of caregivers brought up this issue when asked what challenges they face in raising their children. It was often the first problem they discussed. Because no households can meet their food needs from home production, food insecurity is often expressed as 'a lack of money to buy food', as well as a lack of food from their own production.

Although many families face food insecurity throughout the year, the problem is more severe in some months than in others. During periods of food insecurity, caregivers adapt their recipes. They make simple dishes without the additions that add flavour and nutrients. Caregivers described preparing foods for their infants and young children without oil, sugar, and milk. This leads to problems in children's acceptance of food and to the loss of nutritional qualities in their diet. Caregivers described efforts to buffer their children from food insecurity by skipping meals themselves and eating less. But these

compensatory moves are not sufficient to prevent nutritional and behavioural problems in their children.

The ability of households to cope with food shortages is dependent on many factors. Some of these factors are related to differences in household agricultural management and conditions, including the amount of staple foods grown for home consumption; in availability and types of household plots to extend the growing season; and in the feasibility of growing a diversity of crops to expand the range of food available during the good months and fill in gaps during the worst months. Other factors are related to social and demographic conditions, including the number of adults who contribute financially to the household, the size of the household and the number of children, and health conditions of the household's adults. Single mothers have the most difficult time coping with food insecurity, and their children are at greatest risk of malnutrition.

Caregivers use a variety of resources to try to meet the challenge of not enough food and the lack of money to buy food. Some caregivers have more resources than others. Caregivers who are raising their children alone—because their partners are not in the community or have died or because they have no close relatives nearby—are the most severely affected by food insecurity.

The activities and strategies that caregivers reported using to obtain food, or money to buy food, included jobs for others in the community to earn small amounts of money, making craft products to sell, short-term entrepreneurial activities, food-for-work and other social programs, borrowing food and/or money from relatives, and buying food on credit at local stores. The range of options open to individual women varied widely. For example, between and even within communities, access to social programs appears to be highly variable. In addition, help from relatives is not an option for many, and access to credit depends on the willingness of individual shopkeepers to offer such an accommodation.

Emotionally, periods of serious food shortage are very difficult. The following quotations provide some indication of the stress caused by food insecurity in Kitui:

> 'My head aches because of thinking a lot. I keep worrying because I do not have food and I do not know where to seek help. I think, yet I do not know what to do. Sometimes the head aches and the body feels weak and sick'.

> 'It's very painful not to be able to feed your children. Sometimes I sit down and cry because I look at unhappy children sitting around me yet I can't give them anything. Children do not have school fees and even more there is no food. I feel sad. It's very painful not be able to feed your children'.

> 'Though my husband helps out, sometimes when I ask him for money to buy food he says he does not have it … You know I have children; I cannot run away and go back to my family home. I know well that going back to our home won't help. Who will provide for my children? When the situation becomes worse, I cannot ask for help from my father, he also has his own problems … Some days we sleep hungry; other times we find something to eat. That is life for us'.

5. Summary and Conclusions

Caregivers appreciate the health value of the nutritious foods in their local food system and use them to the extent that their limited resources permit. However, the foods that caregivers have access to and that are culturally acceptable as foods for infants and young children do not provide an adequate basis for healthy IYC growth and development. Although dietary adequacy can be improved using behavioural change inter-

ventions, they alone are insufficient; additional interventions are needed to facilitate access to nutritionally adequate diets for all infants and young children.

Caregivers appreciate the importance of good hygiene and food safety, but are constrained by inadequate access to water; the difficulty of obtaining and cooking with firewood, their only fuel; and the lack of refrigeration. They prepare special foods for their infants and young children once a day and are not able to prepare fresh food over the course of a day. These technological constraints, together with the demands of farm work and hours spent working to earn money, contribute heavily to severe pressures on caregivers' time, including time for taking care of and interacting with their infants and young children. The lack of good child care options when women must be away from their children is a source of worry for mothers and a serious problem for optimal child health.

In sum, the results show that a number of different factors are responsible for poor nutrition in infants and children, and it is not possible to identify one that is most important.

Implications for intervention actions

The implication of the finding that multiple factors are responsible for under-nutrition can be viewed as either a discouraging or a positive outcome. It is discouraging because it shows that there is no one simple solution, comparable to giving an antibiotic to cure an infection. But the positive outcome is that many different actions can be taken, each of which will contribute to improving the nutrition of infants and young children in Kitui. Some of these actions are 'nutrition-specific' and some of them are 'nutrition-sensitive' (defined below). The potential actions vary in the time frame needed to implement them and the resources that are required, and in the time it will take to show results. They also vary in the policies that are required to initiate and support them.

Increasing the market accessibility of nutritious foods is one part of the equation for filling nutrient gaps. Caregivers are heavily oriented to purchasing healthy foods for infants and young children from the market. But markets must be financially accessible to households, and improving caregivers' income stream is therefore essential to realise benefits from market-dependent interventions.

Recommendations

In this section, we make suggestions for two types of interventions, 'nutrition-sensitive interventions' and 'nutrition-specific'. Nutrition-sensitive interventions refer to a class of development activities, for example in agriculture, safety nets, early child development and schooling, that affects nutritional status and well-being because they address the underlying causes of undernutrition, while nutrition-specific interventions are those that address the immediate determinants nutrition (Ruel et al. 2013).

Nutrition-sensitive interventions related to technology and environment actions

- Improve access to clean water sources.
- Promote the use of improved stoves to use firewood more efficiently.
- Introduce stoves that use alternatives to firewood.
- Develop better methods for safer food storage.

High-priority interventions in agriculture

- Identify the reasons for the reported problems in household millet production and improve capacity to grow millet.
- Improve local milk production, at both the household and community levels.
- Explore the potential to improve access to green leafy vegetables through

homestead and community gardens. Innovative, low-technology strategies may be required to overcome the arid conditions in the area.

Interventions to improve household food security by shoring up household economic status

- Create new income-earning opportunities for women though non-farm activities. In Kitui, with its strong tradition of crafts, developing opportunities for women to engage in work craft production and ensuring a fair return on their labour holds promise as a means of improving household income. Other forms of small-scale manufacturing could also be explored. (Such development efforts must be implemented in a fashion that protects breastfeeding and ensures that infants and young children are not left in the care of inappropriate caregivers.)
- Develop and expand programs to identify and provide financial support to women and households in Kitui who are at risk during periods of financial hardship.

Interventions to improve household capacity to provide quality care for infants and young children

- Develop services and programs to address psychological stress in women, particularly depression, because there is growing evidence that health and development of infants and young children is seriously negatively affected by maternal depression and the results of the study suggest this is a common problem.
- Develop alternative, affordable, short-term care facilities for infants and young children so that women can engage in domestic and income-earning activities without endangering their own and their children's health.

Nutrition-specific interventions

- Introduce micronutrient powders and other special nutritional formulations to help fill the nutrient gaps in local diets.
- Promote the use of foods that are currently seen as 'additions' to IYC diets and identify ways to extend this practice to incorporate other nutrient-dense ingredients into IYC dishes (e.g. millet, green leafy vegetables in addition to just vegetable broth, milk, bean flour). Make sure that these nutrient-dense 'food additions' are available in times of food scarcity, when children are particularly vulnerable.
- Contextualise existing behaviour change communication and nutrition education messages used in community and public health nutrition activities to address the specific, realistic dietary changes that have been identified and that can be made within current constraints.

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For more information, contact:
Adan Kabelo, GAIN Kenya Country Director
akabelo@gainhealth.org