# Infant and Young Child Feeding Practices among Pastoralist and Crop Farming Communities in Mvomero District, Tanzania

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**Abstract**

*This study aimed to determine feeding practices of infants and young children among pastoralist and crop farming communities in Mvomero district, Tanzania. A cross-sectional study involved mothers of children below two years of age, from crop farming (n=206) and pastoralist (n=142) communities. ProPAN research tools and procedures were adopted for data collection and analysis. Quantitative data were processed using ProPAN software and descriptive statistics, t-test and Chi-square test were done by SPSS version 21 software. Qualitative data were manually analyzed using the ProPAN matrices. Mean age of mothers (26 years) and of the studied children (12 months) were similar for pastoralists and crop farmers. About 35% (n=50) of pastoralist mothers had no formal education while 93% of the crop farming had at least attended primary school. High proportion of crop farmers (66.5%) initiated breastfeeding within one hour after delivery compared to about 35% in pastoralists. Pre-lacteal feeding was more common among pastoralists (37%) compared to crop farmers (22%). Early complementation was more common among pastoralists (87%) compared to crop farmers (48%). Limited knowledge on infant and young children's nutritional needs, traditional beliefs and cultural restrictions were among the barriers to optimal infant and young child feeding practices. Awareness of mothers regarding the recommendations, and mother's desire for their children to attain good health were the facilitators that enhanced mothers to comply with the recommended feeding practices. To promote optimum feeding practices in both communities, stakeholders should consider planning programs on educating community while addressing cultural specific barriers.*

***Keywords:*** children, pastoralist, crop famers, feeding practices

## Introduction

Appropriate feeding practices are a basic component for survival, growth and development of children (Bhutta *et al.,* 2008; TFNC, 2012). The first two years of life is considered to be a critical window for ensuring optimal child growth and development. Adverse disruptions like poor nutrition during this period can lead to underweight, wasting and stunting. Stunting is associated with impaired cognitive development, reduced school and work performance and hence low economic productivity (Black *et al.,* 2013; URT, 2013).

Poor feeding practices accompanied with the burden of infection are the primary cause of malnutrition worldwide (Bain *et al.,* 2013). Globally only 42% of newborns are introduced to breastfeeding the first hour of birth, 41% of infants 0-5 months of age are exclusively breastfed and only one in six children receive a minimum acceptable diet in low and lower-middle-income countries (UNICEF, 2018).

In Tanzania, although breastfeeding is universally practiced; pre-lacteal feeding, short duration of exclusive breastfeeding, inappropriate timing of introducing complementary foods, poor food preparation, low meal frequency and complementary foods with low energy and nutrient density are common practices (Muhimbula and Issa-Zacharia, 2010; Safari *et al.,* 2013; Vitta *et al.,* 2016). According to TDHS-MIS (2016) report, 59% of infants less than 6 months are exclusively breastfed, only 9% of children aged 6-23 months are fed according to the minimum acceptable dietary standards. The levels of undernutrition among

children under 5 years of age are unacceptable; 34.7, 14 and 5% of the children are stunted, underweight and wasted respectively.

In Morogoro 62% of the children were breastfed within the first hour of birth, more than one third of the children below six months were not exclusively breastfed and 16.5% of children aged 6-23 months received minimum acceptable diet (TFNC, 2014). Various studies conducted in different regions in Tanzania reported inadequate feeding practices (Exavery *et al.,* 2015, Kulwa *et al.,* 2015, Safari *et al.,* 2015); however, data segregation by livelihood is rarely available. According to WHO (1995) classification of severity of malnutrition by prevalence, Morogoro had high rate of stunting (33.4%), medium underweight (11.5%) and medium wasting (6%) (TFNC, 2014).

In their efforts to ensure good nutrition, growth and development, health and survival of children, the United Nations Children's Fund (UNICEF) and Pan American Health Organization (PAHO) developed and validated a set of recommendations to promote infant and young child feeding practices (UNICEF/PAHO, 2013). The recommendations are appropriate in improving breastfeeding and complimentary feeding practices especially in developing countries.

A good understanding of the circumstances behind communities' feeding practices and their differences in malnutrition prevalence is crucial in identifying and designing appropriate interventions that will improve nutrition and well-being of children. This study aimed to assess the extent to which the recommended infant and young child feeding practices are being observed and practiced. The information gathered seeks to strengthen provision of infant and young child feeding (IYCF) interventions and hence improve nutrition status.

## Materials and Methods

### Description of the study area

The study was conducted at Mvomero district; one among the seven districts of Morogoro region. Administratively, Mvomero is made up of four divisions, 17 wards, and 128 registered villages. According to 2012 National census, the average household size was 4.3 people per household (URT, 2013). Majority of the district's population derive their livelihood from crop farming, growing paddy and maize and only the population in the southern part of the district depends primarily on livestock keeping, raising goats and traditional zebu cattle (Lugendo, 2013). The study was conducted at Sokoine and Kimambira villages in Sokoine and Kisongo wards, respectively.

### Study population, sample size and sampling procedure

This cross sectional study comprised of mother child pair with children aged between 0–23 months. Purposive sampling was applied to select the villages with a mixture of both the crop farming and pastoralist households. Simple random sampling was used to select the 348 households (206 crop farming and 142 pastoralists). For the households with more than one child under 23 months of age, the youngest one was selected. Children with any form of disability, serious sickness and the visiting relatives were excluded from the study.

### Data collection

*Pro*PAN research tools were adopted for collection of quantitative and qualitative data. The forms and guides used were: structured caregiver questionnaire, semi structured interview, 24 hour-dietary recall and opportunistic observations form (UNICEF/ PAHO, 2013). Research tools were translated and pretested in 10 randomly selected households having children aged 0-23 months old at Kikuyu ward in Dodoma Municipality.

Face to face interviews with 348 mothers of children aged 0-23 months was conducted between January and June 2017. Dietary assessment involved 286 children aged 6 to 23 months old. During household visits, a person who fed the child was asked to recall foods and beverages she/he fed the index child in the last 24 hours prior to the interview. Utensils used to feed the child were used to estimate the amount of food and beverages served and consumed. Food weight was measured using TANITA kitchen scale. The commonly consumed foods in both communities were identified.

**Data processing and analysis**

Quantitative data were entered and analyzed using *Pro*PAN software with Epi-info (PAHO, 2004). Using SPSS software, descriptive statistics (means, frequencies, standard deviation, and variance) were calculated. Independent t-test and Chi-square test were used to test the significance differences between the two communities. Qualitative data from semi-structured interviews and opportunistic observations were summarized in matrices. The matrices showed the reasons for certain practices, knowledge and attitude of caregivers towards the ideal practices also barriers of and facilitators to ideal practices (PAHO, 2004).

**Ethics and permission to conduct the study**

The study was approved by Sokoine University of Agriculture. Permission to conduct the study was sought from respective district, ward and village authorities. Respondents provided written consent after they were informed about the objectives, modalities and benefits of the study.

**Results**

Socio-economic and Demographic Characteristics of the mothers and the children

Mean age for children was 12 months and mean age of mothers was 26 years in both communities. The pastoral households had mean household size of 8.4 while that of crop farming was 5.2. About one third of pastoralist mothers had no formal education compared to only 7% of the farming communities (Table 1).

Almost all mothers (99.4%) attended antenatal clinics in both communities as shown in Table 2; among these only 18.4% and 3.5% from crop farming and pastoralist communities respectively reported to attend ANC clinics more than three times during pregnancy for the index child. More than 80% of the mothers in crop farming community delivered in health facilities compared to about 9% of the pastoralist mothers. Larger proportion of mothers in crop farming (37%) than in pastoralist community (13.4%) received infant and young child care information within the previous three months.

**Infant and young child feeding practices**

**Breastfeeding practices and timing of complementation**

Nearly all children from both communities were breastfed and given colostrum. Significantly, more mothers in crop farming (66.5%) than in pastoralist community (34.8%) initiated breastfeeding within one hour after birth. About two and four out of 10 children from crop farming and pastoralist communities respectively were given pre-lacteal feeds, the common one being warm water (Table 3).

The majority of the mothers in pastoral (87.2%) and in crop farming (48%) communities introduced complementary foods to their children for the first time when they were less than four months (Fig. 1).

**Most common foods given to children**

Plant based foods were mostly consumed compared to animal source foods. In crop farmers, maize stiff porridge was consumed by more than three quarters of the children (84%) and it was mostly consumed with kidney beans, sardines or vegetable relish while among pastoralists, it was consumed with kidney beans, cow's milk or tomato relish. Consumption of milk was commonly reported among pastoralists while vegetables were frequently given to children of the crop farmers (Fig. 2 and 3). In both communities, fruit were rarely given to children.

**Barriers and facilitators to IYCF: Results from Key Informants interviews**

The main reasons for current feeding practices were limited knowledge on child feeding, social influence and cultural beliefs. For example, with regard to prelacteal feeds, during semi structured interview one mother stated: *"Only little amount of milk is coming out during the first days after birth, so I always start to feed my babies with goat milk on the second day after birth"* (mother from pastoralist community).

Another mother added *'There is no harm to give the baby warm water to clear the intestine before starting to breastfeed. Water is always clean'* (a mother from farming community)

**Table 1: Characteristics of mothers and children 0-23 months of age***

| Variables | Crop farming (N=206) | | Pastoralist (N=142) | | *p*-value |
|---|---|---|---|---|---|
| | n | % | n | % | |
| **Age of the children (months)** | | | | | |
| 0 - 5 | 39 | 19.0 | 23 | 16.2 | 0.521 |
| 6 -11 | 53 | 25.7 | 41 | 28.9 | |
| 12-17 | 60 | 29.1 | 41 | 28.9 | |
| 18 -24 | 54 | 26.2 | 37 | 26 | |
| **Sex of the children** | | | | | |
| Male | 97 | 47.1 | 68 | 47.9 | 0.986 |
| Female | 109 | 52.9 | 74 | 52.1 | |
| **Maternal age (years)** | | | | | |
| <18 | 5 | 2.4 | 16 | 11.3 | 0.039 |
| 18- 24 | 62 | 30.1 | 55 | 38.7 | |
| 25 - 35 | 110 | 53.4 | 45 | 31.7 | |
| >35 | 29 | 14.1 | 26 | 18.3 | |
| **Marital status** | | | | | |
| Married | 181 | 87.8 | 142 | 100 | 0.000 |
| Single | 25 | 12.3 | 0 | 0 | |
| Maternal education level | | | | | |
| Informal education | 15 | 7.3 | 50 | 35.2 | 0.000 |
| Primary education | 158 | 76.7 | 83 | 58.5 | |
| Secondary education and post-secondary | 33 | 16 | 9 | 6.3 | |
| **Maternal main source of income** | | | | | |
| Laborer | 171 | 83 | 139 | 97.9 | 0.000 |
| Vendor | 17 | 8.2 | 3 | 2.1 | |
| Agriculture work | 8 | 4.0 | 0 | 0 | |
| Formal employment | 10 | 4.8 | 0 | 0 | |

**Chi square test. Significant at p<0.05*

*'We always give ghee to a new born baby to induce passing out of meconium hence keep the child's intestine clean. We were told by our parents and we continue doing that. We have not observed any problem with that so far'* (a mother from pastoralist community).

Another barrier to optimal breastfeeding was misinterpretation of baby's hunger or satiety cues. It was noted during observation that mothers breastfed for only a short time sometimes as a response to soothe the baby when crying and stops shortly after the child stops crying. Breastfeeding is regarded as a way to stop the child from crying without considering satiety or hunger cues. The common mentioned reasons for early complementation were perceived milk shortage, lack of knowledge on the effect of early complementation, misinterpretation that the baby is crying often because breast milk is no longer satisfying. One respondent from crop farming community said:

**Table 2: Use of health services by mothers: comparison of crop farming and pastoralist communities***

| | Crop farming N=206 | | Pastoralist N=142 | | *p*-value |
|---|---|---|---|---|---|
| | n | % | n | % | |
| **Place of delivery** | | | | | |
| Health facility | 185 | 89.8 | 13 | 9.2 | 0.000 |
| Home | 17 | 8.2 | 72 | 50.7 | |
| TBA's house | 4 | 2.0 | 56 | 39.4 | |
| On the way to hospital | 0 | 0 | 1 | 0.7 | |
| **Assistance during delivery** | | | | | |
| Health worker | 184 | 89.3 | 13 | 9.1 | 0.000 |
| TBA | 18 | 8.7 | 65 | 45.8 | |
| Untrained person | 4 | 2.0 | 64 | 44.4 | |
| **Attending MCH growth monitoring clinic** | | | | | |
| Yes | 202 | 98.1 | 133 | 93.7 | 0.049 |
| No | 4 | 1.9 | 9 | 6.3 | |
| **Mothers received information on child feeding** | | | | | |
| Yes | 76 | 36.9 | 19 | 13.4 | 0.000 |
| No | 130 | 63.1 | 123 | 86.6 | |
| **Children aged 6-59 months who had received vitamin A in the last 6 months**** | | | | | |
| Yes | 161 | 96.4 | 107 | 89.9 | 0.034 |
| No | 6 | 3.6 | 12 | 10.1 | |

***Chi square test, significant at p<0.05*

**Children below 6 months were excluded in the analysis*

*"After three months, the child is big enough to start eating other foods. It cannot grow well with milk alone so smooth maize porridge will make the child to stop crying, grow well and sleep longer"*

Early complementation was practiced in both communities but more common among pastoralists due to cultural and traditional beliefs.

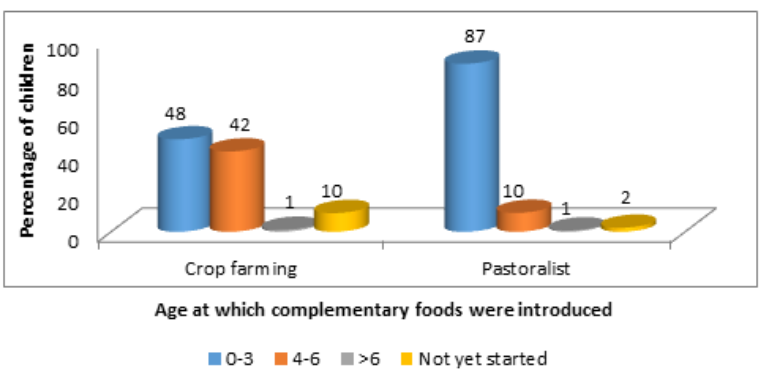


**Figure 1: Age of child when started complementary foods**

**Table 3: Breastfeeding practices for children 0-23 months**

| | Crop farming N=206 | | Pastoralist N=142 | | *p*-value |
|---|---|---|---|---|---|
| | n | % | n | % | |
| **Ever breastfed** | | | | | |
| Yes | 206 | 100 | 141 | 99.3 | 0.228 |
| **Initiation of breastfeeding** ***Excludes children who were never breastfed*** | | | | | |
| Within 1 hour | 137 | 66.5 | 49 | 34.8 | 0.003 |
| 1-3 hours | 52 | 25.2 | 70 | 49.6 | |
| More than 3 hours | 10 | 4.9 | 13 | 9.2 | |
| Doesn't know | 7 | 3.4 | 9 | 6.4 | |
| **Children given colostrum** ***Excludes children who were never breastfed*** | | | | | |
| Yes | 200 | 97.1 | 141 | 100 | 0.149 |
| No | 6 | 2.9 | 0 | 0 | |
| **Child given anything other than breast milk during the first three days after birth** ***Excludes children who were never breastfed*** | | | | | |
| Yes | 45 | 21.8 | 52 | 36.8 | 0.009 |
| No | 159 | 77.2 | 88 | 62.4 | |
| Doesn't know | 2 | 1 | 1 | 0.7 | |
| **Pre-lacteals given** ***excludes children who were not given pre-lacteals*** | | | | | |
| Water (including sugary water) | 23 | 51.1 | 23 | 44.2 | 0.200 |
| Other non-breast milk | 10 | 22.2 | 19 | 36.5 | |
| Others (tradition medicine, ghee, porridge) | 12 | 26.7 | 10 | 19.2 | |
| **Whether the child was breastfed yesterday** ***Excludes children who are not breastfed*** | | | | | |
| Yes | 189 | 91.7 | 135 | 97.9 | 0.016 |
| **Breastfeeding on demand** ***Excludes children who are not breastfed*** | | | | | |
| Whenever the child wanted | 186 | 98.4 | 137 | 99.3 | 0.172 |
| On a fixed schedule | 3 | 1.6 | 1 | 0.7 | |
| **Exclusive breastfeeding (6 months)** | | | | | |
| Yes | 80 | 39 | 11 | 7.8 | 0.000 |
| **Continued breastfeeding at 2 year** ***Children 20-23 months of age who are breast fed*** | | | | | |
| Yes | 23 | 74.2 | 22 | 91.7 | 0.096 |

For the mothers who reported to follow recommended child feeding practices, they mentioned some facilitators including availability of health facilities, community health workers and peer support groups who provide education and cancelling information on perceived benefits of breast milk. One mother from crop farmers said *"I learnt the benefits of exclusive breastfeeding from Mwanzo Bora project groups and I had a desire to practice it for my child. My child is healthy has gained weight as required. I feel it is a good practice"*. Mothers reported that the inclusion of animal source foods in child's food was also emphasized during peer group sessions. However, the main constraint was cost especially for the crop farmers while for the pastoralists; the main barrier was limited knowledge and cultural believes. A mother from pastoralists said:

*"We give our children maize porridge and that is enough for the baby. We grew up knowing*

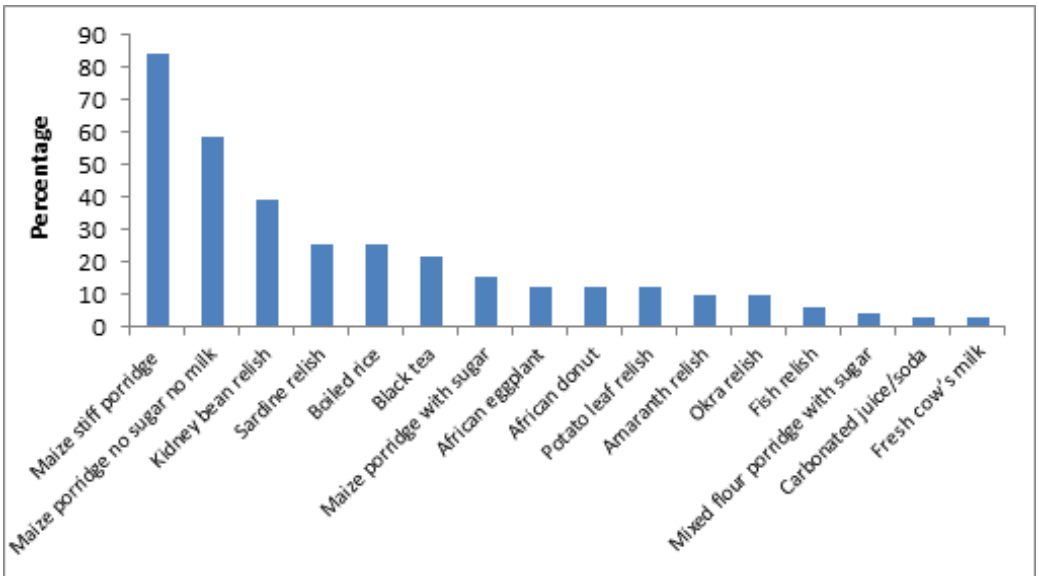


**Figure 2: Common foods given to children in farming communities**

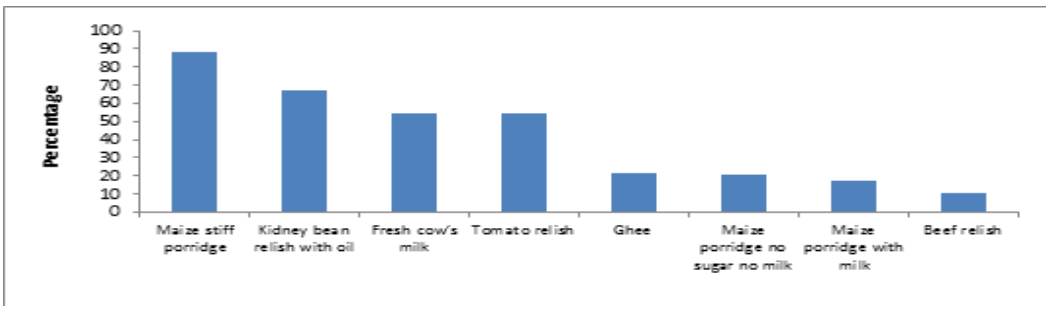


**Figure 3: Most common foods given to children in pastoral communities**

*that maize porridge and milk is enough for the child up to two years"*

## Discussion

### Breastfeeding practices

This study assessed the conformity of crop farming and pastoralist communities to recommendations of infant and young child feeding practices. About half of the children involved in this study were breastfed within the first hour of birth, and the proportion of children breastfed within the first hour was higher among crop farming households. More mothers in the farming community had attained formal education which might have facilitated early initiation of BF. Early initiation of BF was much lower among pastoral communities than what was reported in other studies conducted in Tanzania (Exavery *et al.,* 2015, MoHCDGEC, 2018); and in Ethiopia (Woldeamanuel, 2020). The possible reasons for not breastfeeding in time that were identified in this study and other studies include mode of delivery, education level of the mother, place of delivery and receipt of information on child feeding (Ahmed and Salih, 2019; Woldeamanuel, 2020). Other reasons were more cultural related such as poor perception that milk cannot start flowing immediately after giving birth and other activities which delayed the process like belief that mothers are unclean after delivery process thus they need to take time to clean themselves and babies before they start breastfeeding (Kalisa *et al.,* 2015). The same were reported in the qualitative data collected in this study. It was reported in systematic reviews that delayed initiation of breastfeeding increases the risk of child mortality (Edmund *et al.,* 2006, Smith *et al.,* 2017, Takahashi *et al.,* 2017);

hence children of the pastoralist communities may have increased risk of mortality.

Beside the negative effects of pre-lacteal feeding on the growth and development of children, considerable numbers of children were given pre-lacteal feeds between one and three days after they were born; warm water being the most common pre-lacteal given. The reasons for feeding babies with pre-lacteals were the perception that mother's milk is too little to satisfy the baby for the first days and attempts to relieve infants with stomach pain. Ghee was also reported among the pre-lacteals in pastoralist, believed to induce passing out of meconium to newborns. In most African countries, prelacteal feeds are still common especially in rural communities (Engebretsen *et al.,* 2014; Kinabo *et al.,* 2017; Chea and Asefa, 2018; Muhimbula *et al.,* 2019). In this study, majority of the pastoralist mothers delivered at home which might have contributed to high rates of prelacteal feeds. A systematic review in Ethiopia reported that women who delivered at home had higher odds for prelacteal feeding compared to those who delivered at a health facility (Temesgen *et al.,* 2018). This means promotion of early initiation of breastfeeding is important to avoid effects which may be caused by prelacteal feeding. Muhimbula *et al.* (2019) reported increased risk for acute malnutrition and underweight in children rural Tanzanian children who were given other fluids in the first three days after they were born.

Majority of the children in this study were fed on colostrum. During semi structured interviews when mothers were asked about feeding their children with colostrum it was stated that: 'First milk is not discarded since most of us are aware of its benefits'. This positive observation could be due to the widespread of education and information on benefits of the colostrum. Similar results of colostrum feeding to infants were reported by a study conducted in Tanzania (Safari *et al.,* 2013, Kinabo *et al.,* 2017).

Prevalence of exclusive breastfeeding in both communities was lower than the national average (TDHS-MIS, 2016). The perceived reasons for shorter duration of exclusive breastfeeding included the perception that milk is insufficient and cultural practices. It is possible that the high rates of malnutrition in the studied communities could be a result of failure to follow breastfeeding recommendations. Other studies done in rural and urban areas of Morogoro, Kilimanjaro and Tanga, Tanzania also found a lower prevalence of exclusive breastfeeding for six months (Mgongo *et al.,* 2013; Safari *et al.,* 2013; Maonga *et al.,* 2016;) Main barriers to optimal breastfeeding in this study were poor knowledge of the best practices, perceived milk shortage, women workload, and late attendance to Antenatal Care (ANC), home delivery, social influence and medical complications. Generally, there is a group counseling and prenatal education given to pregnant women during ANC. It is possible that some women did not receive the education or they don't pay much attention to it. Another reason for such barriers is cultural norms where by child feeding practices are more guided by cultural believes within a particular community. It is worth noting that such barriers were reported in other studies done in Tanzania, Nigeria, Congo DRC and Zimbabwe that the influence of the family members are the greatest barriers to optimal breastfeeding (Onah *et al.,* 2014; Muchacha and Mtetwa, 2015; Burns *et al.,* 2016; Mgongo, *et al.,* 2019).

Despite the numerous barriers to optimal breastfeeding some facilitators were noted which provide the opportunity for improving child feeding practices. Perceived benefit and advantages of breastfeeding, presence of health centers with skilled health providers and presence of health care providers at the community who provide education on the importance of optimal breastfeeding were some of the facilitators reported. These facilitators, if well used can improve adoption of best practices of optimal breastfeeding in Tanzanian communities. Similar results were reported in other studies conducted in different settings in Tanzania (Kinabo *et al.,* 2017; Mgongo *et al.,* 2019).

**Complementary feeding**

It was observed in this study that majority of infants were introduced to complementary foods at the age less than six months. Early

introduction of complementary foods before the recommended age of 6 months is common in developing countries (Safari *et al.,* 2013; Burns *et al.,* 2016). Although analysis of association between child feeding practices and nutrition status was not done in this study, it was reported in other studies that early introduction of complimentary foods is associated with undernutrition (Okwori *et al.,* 2011; Bhuta, 2013) hence, a possibility of high rates of undernutrition in the studied community.

Animal source foods other than milk were less consumed even in pastoralist community who are presumed to consume meat frequently than crop farmers. Generally, animals are slaughtered only on special occasions since they are considered as a sign of wealth. It was noted that poultry and fish are not consumed in pastoralist community due to cultural prohibitions. However, these beliefs are changing quite rapidly due to climate change and changes in livelihood strategies (Chege *et al.,* 2015). Similar findings of less frequent meat consumption in pastoralist community were also observed in other studies done in Kenya and in Ethiopia (Chege *et al.,* 2015; Galvin *et al.,* 2015).

Green leafy vegetables were rarely consumed in pastoral community. This could be due to the belief that vegetables are foods for animals (Chege *et al.,* 2015). In both communities, none of the children was reported to consume fruit in the previous day before the survey. Reasons for limited consumption of fruit and vegetables could be knowledge on their importance to children's diet, seasonal availability or limited income to afford purchase of fruit and vegetables. Fruit and vegetables are among the major dietary sources of many valuable micronutrients; hence low intake could lead to micronutrient deficiencies especially because intake of animal source foods is already low. Poor intake of fruit and vegetables among pastoralist community was also reported by Chege *et al.* (2015) and Mengistu *et al.* (2017) in studies done in Kenya and in Ethiopia. Since children are given family foods, this means it is important to diversify the family foods and provide them with additional snack.

This study noted the low level of knowledge on optimal complementary feeding among the mothers, cultural food restriction, social and economic influence as the constraints to optimal complementary feeding practices. Similar factors were highlighted in other studies (Exavery *et al.,* 2015; Kulwa *et al.,* 2015; Mengistu *et al.,* 2017). Poor complimentary feeding may lead to delayed growth, increased risk for undernutrition and cause anaemia in infants (Chen *et al.,* 2010; Huo *et al.,* 2015).

## Conclusion

Most of the feeding practices were far from optimal recommendations especially among the pastoralist communities. Several barriers to optimal child feeding were noted that related to cultural believes, educational and socioeconomic. Some foods were not considered important to children thus limit food diversification during this important stage of growth. To promote optimum feeding practices in both communities, stakeholders should consider planning programs on educating these communities while addressing cultural specific barriers. Furthermore, promotion of breastfeeding through different media, use of health care workers and trusted community leaders may help to improve IYCF practices especially among pastoral communities.

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