


# The effect of antenatal care on colostrum avoidance in pastoralists: The case of Afar, Northeast Ethiopia

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## Abstract

Breastfeeding is sufficient for infants in the first 6 months of life and is important to maintain maternal health. Evidences revealed that neonatal mortality is higher among children who received colostrum as compared to those who are deprived of colostrum. Therefore, this study aimed to assess the factors associated with colostrum avoidance practice among pastoralists in Afar Regional State, Northeast Ethiopia. A community-based cross-sectional study was conducted on 1188 mother-child pairs in Afar Regional State in June 2016. Univariable and multivariable logistic regression analyses were carried out to identify the predictors of colostrum avoidance. Statistical significance was declared at  $P$ -value  $< .05$ . About 40% of children deprived of colostrum. Mothers aged 20 to 34 years (AOR: 1.79; 95% CI: 1.18, 2.73), not attending antenatal checkup (AOR: 1.82; 95% CI: 1.64, 2.85), receiving prelacteal feeding (AOR: 2.21; CI: 1.88, 3.93) and late initiation of breastfeeding (AOR: 2.71; 95% CI: 2.02, 3.65) were positively associated with colostrum avoidance. Nearly 4 in 10 children deprived of colostrum. Therefore, promoting antenatal care and strengthening service-based counseling on proper newborn feeding practices will be important to improve colostrum feeding.

## Keywords

Afar, Antenatal, children, Colostrum, Pastoral

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## Introduction

Breastfeeding is sufficient for infants in the first 6 months of life and is important to maintain maternal health.<sup>1</sup> For instance, it helps the contraction of the uterus and reduces postpartum hemorrhage.<sup>2,3</sup> Contrary to the World Health Organization (WHO) recommendation, infants are forced to take other kinds of milk and complementary foods within the first 6 months. Moreover, about 6% of infants are not breastfed at all. In Ethiopia, only 59% of infants aged less than 6 months are exclusively breastfed.<sup>2</sup>

Colostrum is the special breast milk produced in the first few days postpartum. It is a yellowish and sticky. Colostrum contains more protein, vitamin A, white blood cells and antibodies.<sup>4-8</sup> Thus, colostrum provides a natural immunity against infectious diseases and is considered as the first immunization to newborns.<sup>4</sup> It has a mild purgative effect, which helps to clear meconium. This clears bilirubin from the gut and helps to prevent jaundice. In addition, colostrum contains growth factors and

hormones, which help a newborn's immature intestine to develop and helps to prevent the baby from developing allergies and intolerance to other foods.<sup>3-5,7,9,10</sup>

Supplementing breast milk with other liquids and/or foods within the first 6 months may expose infants to illnesses and accelerate infant mortality.<sup>3</sup> Colostrum avoidance is associated with higher probabilities of child under nutrition.<sup>11</sup> Evidence revealed that neonatal mortality was higher among children who received colostrum compared to neonates who did not receive colostrum.<sup>12</sup> In Ethiopia, the mortality rate among children aged less than 5 years is 67 deaths per 1000 live births, and the infant mortality rate is 48 deaths per 1000

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live births. The highest mortality rate is in Afar region; 125 deaths per 1000 live births.<sup>3</sup>

Despite the above facts, colostrum avoidance is still practiced in many countries<sup>13</sup> and different parts of Ethiopia,<sup>10,14-16</sup> including Afar regional state.<sup>14,17</sup> Moreover, there is limited evidence on the factors associated with colostrum avoidance in Afar National Regional State. Therefore, this secondary analysis aimed to assess the factors associated with colostrum avoidance practice among pastoralists in Afar Regional State, Northeast Ethiopia.

## Methods

### Study Setting and Design

A community-based cross-sectional study was conducted among children aged 6 to 23 months in Afar Regional State in June 2016. Afar is a semi-arid region and the majority of the population is pastoralist. There are 5 zones in the region. A pastoralist is defined as a community that derives more than 50% of their food and income needs from livestock.<sup>18</sup>

### Study Participants and Sampling Procedure

A stratified multi-stage sampling was employed to include 1188 mother-child pairs. First, 2 zones (zone 1 and 4) were randomly selected. Then, 2 districts were randomly selected from each zone. Thirty percent of kebeles (lowest administrative units next to a district in Ethiopia) from each district were considered. The sample size was proportionally allocated to each kebele based on the number of eligible children using health extension log book. Finally, a simple random sampling technique was used to select eligible children. If there were more than 1 eligible child in 1 household unit, 1 child was selected using a lottery method. Children of mothers with communication problem were excluded from the study.

### Study Variables

The dependent variable was colostrum avoidance practice. The independent variables were socio-demographic characteristics, child-feeding practices, maternal and child health-related characteristics.

### Data Collection Instrument and Procedures

Data were collected using an interviewer-administered questionnaire. The study tool was initially prepared in English and translated to Afar'af (the local language).

Eight diploma and 4 degree graduated health professionals were recruited as data collectors and supervisors, respectively. The data collectors and supervisors were trained for 2 days. Then, the tool was pre-tested on 5% of the sample size. Child's age was recorded using written official documents (vaccination cards). But for children who did not have written documents, a maternal recall was considered.

### Data Processing and Analysis

This is a secondary analysis of data from a community-based cross-sectional study. Data were coded, cleaned and entered into Epi-Info version 7.1.4 and then exported to SPSS version 20 for analysis. Univariable and multivariable logistic regression analyses were carried out to identify the predictors of colostrum avoidance. Variables with  $P$ -value  $< .25$  in the univariable logistic regression analysis were included in the multivariable analysis. Crude and adjusted odds ratio (AOR) with 95% confidence interval were estimated. The Hosmer-Lemeshow goodness-of-fit with enter procedure was used to test for model fitness. Statistical significance was declared at  $P$ -value  $< .05$ .

## Results

### Socio-Demographic Characteristics of the Study Participants

In this analysis 1129 mother-child pairs were included. A majority (84.5%) were in the age of 20 to 34 years. Ninety-six percent of mothers had ever married and 75.1% were illiterate. About 59% of mothers in the age of 20 to 34 years, 57% of mothers in households which were led by husbands and nearly 68% of mothers living in urban areas gave colostrum to their child (Table 1).

### Health Service and Obstetric Characteristics

Nearly 3 in 9 (33.3%) and 28% of mothers had attended antenatal and postnatal checkup, respectively. About 56% of the study participants had delivered the index child at home. Nearly 92% of the study participants who attended postnatal checkup and about 77% of the study participants who attended antenatal checkup had received advice on proper infant and young child feeding practices (Table 2).

### Child Characteristics and Feeding Practices

About 47% of children received breastfeeding early. Sixty-eight percent and 39.5% (95% CI: 36.65%,

**Table 1.** Socio-Demographic Characteristics of Mothers of Children Aged 6 to 23 Months in Pastoral Areas, Afar Regional State, Northeast Ethiopia, 2016 (n = 1129).

	Colostrum avoidance (n = 1129)	
	No	Yes
	n (%)	n (%)
Age of mother (year)		
<20	18 (72)	7 (28)
20-34	562 (58.9)	392 (41.1)
>34	103 (68.7)	47 (31.3)
Residence		
Rural	588 (59.5)	401 (40.5)
Urban	95 (67.9)	45 (32.1)
Household head		
Wife	386 (63.5)	222 (36.5)
Husband	297 (57.0)	222 (43.0)
Marital status		
Ever married	665 (61.5)	417 (38.5)
Never married	18 (38.3)	29 (61.7)
Maternal educational status		
Formal	59 (42.1)	81 (57.9)
Illiterate	540 (63.7)	308 (36.3)
Informal	84 (59.6)	57 (40.4)
Husband educational status		
Formal	94 (45.6)	112 (54.4)
Illiterate	528 (65.7)	276 (34.3)
Informal	61 (51.3)	58 (48.7)
Decision making		
Mainly wife	67 (62.6)	40 (37.4)
Mainly husband	287 (63.5)	165 (36.5)
Only a wife	7 (43.8)	9 (56.2)
Only a husband	53 (72.6)	20 (27.4)
Both jointly	269 (55.9)	212 (44.1)
Family size		
2-3	74 (62.7)	44 (37.3)
>3	609 (60.2)	402 (39.8)
Number of under-five children		
1	211 (64.1)	118 (35.9)
2	396 (59.7)	267 (40.3)
≥3	76 (55.5)	61 (44.5)

42.36%) mothers practiced prelacteal feeding and colostrum avoidance, respectively (Table 3).

### Factors Associated with Colostrum Avoidance

Univariable logistic regression analysis showed that maternal age, household head, prelacteal feeding, early initiation of breastfeeding, antenatal and postnatal checkup significantly associated with colostrum avoidance. In the multivariable logistic regression analysis

**Table 2.** Health Service Utilization Among Mothers of Children Aged 6 to 23 Months in Pastoral Areas, Afar Regional State, Northeast Ethiopia, 2016 (n = 1129).

	Colostrum avoidance (n = 1129)	
	No	Yes
	n (%)	n (%)
ANC checkup		
No	409 (54.3)	344 (45.7)
Yes	274 (72.9)	102 (27.1)
Advice on IYCF during ANC checkup		
No	55 (63.2)	32 (36.8)
Yes	219 (75.8)	70 (24.2)
Number of ANC checkup		
1	7 (46.7)	8 (53.3)
2-3	128 (72.7)	48 (27.3)
≥4	139 (75.1)	46 (24.9)
Mode of delivery		
Cesarean	21 (72.4)	8 (27.6)
Vaginal	662 (60.2)	438 (39.5)
PNC checkup		
No	471 (58.0)	341 (42.0)
Yes	212 (66.9)	105 (33.1)
Advice on IYCF during PNC checkup		
No	12 (44.4)	15 (55.6)
Yes	200 (69.0)	90 (31.0)
Place of delivery		
Home	381 (60.2)	252 (39.8)
Health institution	302 (60.9)	194 (39.1)

**Table 3.** Child Characteristics and Feeding Practices in Pastoral Areas, Afar Regional State, Northeast Ethiopia, 2016 (n = 1129).

	Colostrum avoidance (n = 1129)	
	No	Yes
	n (%)	n (%)
Sex of child		
Male	410 (59.2)	283 (40.8)
Female	273 (62.6)	163 (37.4)
Age of the child (month)		
6-11	282 (56.7)	215 (43.3)
12-17	218 (70.8)	90 (29.2)
18-23	183 (56.5)	141 (43.5)
Birth order		
1	66 (64.1)	37 (35.9)
2-3	407 (59.3)	279 (40.7)
>3	210 (61.8)	130 (38.2)
Prelacteal feeding		
Yes	358 (46.6)	410 (53.4)
No	325 (90.0)	36 (10.0)
Early initiation of breastfeeding		
No	274 (45.4)	330 (54.6)
Yes	409 (77.9)	116 (22.1)

**Table 4.** Univariable and Multivariable Logistic Regression Analysis on the Predictors of Colostrum Avoidance Among Mother-Child Pairs in Pastoral Areas, Northeast Ethiopia, 2016.

	Colostrum avoidance		COR (95% CI)	AOR (95% CI)
	Yes	No		
Age of mother (Year)				
<20	7	18	0.85 (0.33, 2.18)	0.83 (0.30, 2.29)
20-34	392	562	1.53 (1.06, 2.21)*	1.79 (1.18, 2.73)*
>34	47	103		
Residence				
Rural	401	588	1.44 (0.99, 2.09)	0.93 (0.81, 1.12)
Urban	45	95		
Household head				
Wife	222	386	0.76 (0.60, 0.97)*	1.01 (0.76, 1.35)
Husband	222	297		
Antenatal checkup				
No	344	409	2.26 (1.73, 2.96)*	1.82 (1.64, 2.85)*
Yes	102	274		
Mode of delivery				
Cesarean	8	21	0.58 (0.25, 1.31)	0.59 (0.24, 1.490)
Vaginal	438	662		
Postnatal checkup				
No	341	471	1.46 (1.11, 1.92)*	0.55 (0.45, 1.12)
Yes	105	212		
Sex of child				
Male	283	410	1.16 (0.90, 1.48)	1.3 (0.98, 1.73)
Female	163	273		
Prelacteal feeding				
Yes	410	358	10.34 (7.13, 15.00)*	2.21 (1.88, 3.93)*
No	36	325		
Early initiation of breastfeeding				
No	330	274	4.25 (3.27, 5.51)*	2.71 (2.02, 3.65)*
Yes	116	409		

maternal age, prelacteal feeding, early initiation of breastfeeding and antenatal checkup were statistically significant at  $P < .05$  (Table 4).

Mothers aged 20 to 34 years were more likely to discard colostrum (AOR: 1.79; 95% CI: 1.18, 2.73) as compared to those aged older than 34 years. Women who lacked antenatal checkup were more likely to discard colostrum (AOR: 1.82; 95% CI: 1.64, 2.85) as compared to women who attended. Children who had received prelacteal feeds were more likely to be deprived of colostrum (AOR: 2.21; CI: 1.88, 3.93) as compared to those who did not receive the feeds. Women who initiated breastfeeding lately were more likely to discard colostrum (AOR: 2.71; 95% CI: 2.02, 3.65) as compared to those who initiated early.

## Discussion

Breastfeeding practices are suboptimal in Afar National Regional State. This analysis showed that 39.5% [95%

CI: 36.65%, 42.36%] of children were deprived of colostrum which is relatively similar with the findings from Amibara district (36.9%).<sup>14</sup> However, it is higher as compared to the findings from Raya Kobo district (13.5%),<sup>5</sup> Samara-Logia city administration (12%),<sup>17</sup> Aksum town (6.5%),<sup>15</sup> North Wollo zone (12%),<sup>16</sup> and Nepal (16.5%).<sup>19</sup> Qualitative findings from Gozamin district revealed that mothers consider colostrum as a cause of wound on the throat of the child, diarrhea and makes the child very thin.<sup>20</sup>

About 77% of the study participants who attended antenatal checkup had received advice on proper infant and young child feeding practices. Hence, women who had a history of antenatal checkup were 82% less likely to discard colostrum as compared to those women who lacked the checkup. In Raya kobo district, mothers who did not know the advantages of colostrum were more likely to discard it.<sup>10</sup> In line with this, mothers who received counseling on infant feeding at antenatal check-up were less likely to discontinue exclusive

breastfeeding before 6 months as compared to those who did not receive counseling.<sup>17</sup> Similar findings were reported at Aksum town<sup>15</sup> and northwest Ethiopia.<sup>21</sup> Mothers who attended antenatal checkup may be advised by health professionals about the advantages of colostrum. In addition, mothers who did not know the dangers of prelacteal feeding were more likely to practice prelacteal feeding compared to mothers who knew the dangers of prelacteal feeding.<sup>22</sup>

Children who had received prelacteal feeds were about 2 times more likely to be deprived of colostrum as compared to those who did not receive the feeds. A relatively similar finding is found at North Wollo zone.<sup>16</sup> In Raya kobo district, untrained traditional birth attendant believe that colostrum causes abdominal cramp and raw butter cleans infants' stomach, therefore, she recommends mothers to discard colostrum and to feed their infants with raw butter before breastfeeding initiation.<sup>12</sup>

Women who initiated breastfeeding lately were 2.7 times more likely to discard colostrum as compared to those who initiated early. Similarly, mothers who had late initiation had more odds of discarding colostrum than mothers who initiated breastfeeding within 1 hour after delivery.<sup>10,16</sup> In line with this, mothers who initiated breastfeeding lately were nearly 3 times more likely to practice prelacteal feeding compared to mothers who initiated breastfeeding early.<sup>22</sup> In fact colostrum avoidance may cause late initiation of breastfeeding. In Nepal, Infants who did not receive colostrum were less likely to have begun breastfeeding within an hour of birth compared to those who received colostrum.<sup>19</sup> This might be explained as the time of breastfeeding initiation increases, there will be more time for colostrum avoidance.

Mothers aged 20 to 34 years were 79% more likely to discard colostrum as compared those aged older than 34 years. In Amibara district, mothers with 2 or 3 children were less likely to breastfeed their child within 1 hour of birth compared to mothers with 4 or more children.<sup>14</sup> This can be justified in such a way that older mothers might have experiences on feeding colostrum to their infants, unlike younger mothers.

## Conclusion

This study showed that the magnitude of colostrum avoidance was 39.5%. Maternal age, antenatal checkup, prelacteal feeding and early initiation of breastfeeding were the predictors of colostrum avoidance. Therefore, promoting antenatal care and strengthening counseling and advice on proper newborn and infant feeding practices will be important to improve colostrum feeding. The study will be prone to the following limitations. Firstly, it is unable to establish cause-effect relationship.

It is also prone to recall bias and children under the age of 6 months were excluded.

## Author Contributions

MLL and NBY conceived this problem. MLL designed this problem. RA controlled the overall activity of data collection in the primary study. MLL performed data analysis and interpretation. NBY and RA involved in the interpretation of data. MLL drafted and finalized the manuscript. All authors read and approved the final manuscript.

## Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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## Ethics Approval and Consent to Participate

The study was approved by the Research Ethics Review Committee (RERC) of the College of Medical and Health Sciences at Samara University dated 12th May 2016 (Reference number: ERC/0018/2016). Participants were provided with the information regarding the purpose, objective, procedures, potential risks and benefits of the study, and the right to withdraw from the study. They were also assured of strict confidentiality with regard to any information obtained from them.

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## Availability of Data and Materials

The datasets used and analyzed during the study are available from the corresponding author on reasonable request. The co-authors gave full responsibility to the corresponding author to share and discuss with editors and reviewers.

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