Global perspectives: What Anthropology can tell us about breastfeeding

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Breastfeeding Concerns

1. How often should I breastfeed?
2. How long should I breastfeed my infant?
3. When should I add new foods?
4. Is my breastfeed baby healthy/growing?

1. How often should I breastfeed?

“On demand” or cue feeding

- Follow infant cues to determine when to feed

Demand is culturally constructed

- Anthropological truism: All behavior, even that of a tiny nursing baby, is never independent of the setting in which it occurs

Case of Quechuan mothers in Nuñoa, Peru

What does "demand" mean in Peru?

- Mothers' reports of feeding frequency differ dramatically from observed

TABLE 1. Comparison of Reported and Observed Magnitude of Daily Breastfeeding

ID Number	Daily Frequency		Mean Duration (min)		Total Magnitude (min)		Rank Order (Total)	
	R	O	R	O	R	O	R	O
08	6	13	5–10	1.55	30–60	20	2	1
19	10	9	10–15–20–30	4.33	100–300	41	8	2
25	4	22	5	1.87	20	42	1	3
15	5	21	30	1.76	150	43	6	4
13	6	15	25–30	3.39	150–180	49	7	5
14	7	10	50–60	4.97	350–420	56	9	6
27	3	10	30	5.30	90	54	3.5	7
07	6	21	15	3.82	90	82	3.5	8
12	6–7	26	15	5.06	90–105	120	5	9

Vitzthum, V. J. (1994). Annals of the New York Academy of Sciences, 709.

What does "demand" mean in Peru?

- Comparison of feeding: Quechuan women vs. Turkana (Kenya) women

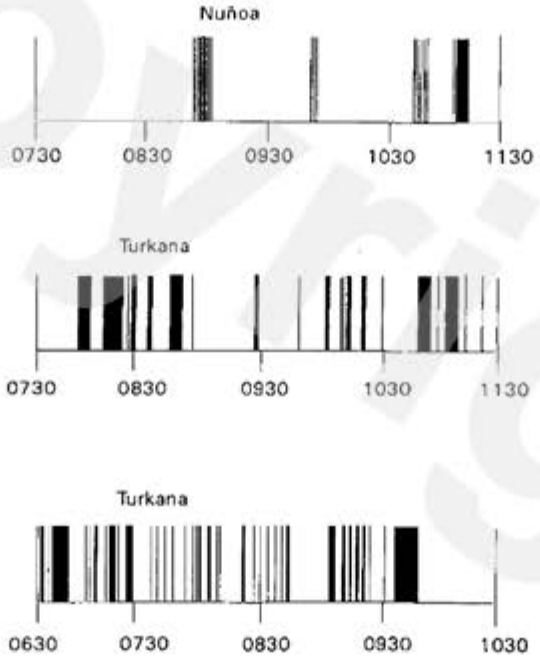


Fig. 1. Variation in breastfeeding structure. Timed suckling activity in a 7-month-old Nuñoa infant and a Turkana infant observed at 3 months (middle panel) and 8 months (bottom panel) of age. Each vertical bar represents a suckling episode; episodes separated by less than 1 minute compose a nursing session. (Modified from Vitzthum, 1989; and Gray, 1994.)

Vitzthum, V. J. (1994). Yearbook of Physical Anthropology, 37.

What does “demand” mean in Peru?

- Cultural factors that promote unique Peruvian breastfeeding structure:
  - Season (work in field vs. home)
  - Cold temps prohibit much night feeding despite cosleeping
  - Extended family as caretakers
  - Babies are worn and breastfeeding is very casual

“On demand” in US breastfeeding moms

Reported 24-frequency of feeding in 61 moms: 10.5±3.5

Ariaal mothers of Kenya

- Settled pastoralist population
- 251 breastfeeding mother-infant pairs

US moms vs. Ariaal moms

- Ariaal moms more likely to report 24-hour frequencies >20
- US moms and Ariaal moms report equal night feeding (3.1 vs. 2.8)
  - Jim McKenna notes this number is probably ½ true number for cosleepers

Ariaal: Predictors of feeding frequency

- Resumption of menstruation is associated with low feeding frequency
- Low BMI is associated with higher feeding frequency
- More children is associated with low feeding frequency
- SES associated with high feeding frequency

Some factors to look at cross culturally:

- Work expectations
- Presence of non-maternal caregivers
- Family structures
- Beliefs about milk and non-milk foods
- Parking vs. carrying babies
- Beliefs about infant sleep
- Subsistence and market availability
- Nutritive vs. non-nutritive suckling
- Etc.

…all of these shape “demand” and thus nursing behavior

2. How long should I breastfeed my infant?

World Health Organization

Exclusive breastfeeding is recommended up to 6 months of age, with continued breastfeeding along with appropriate complementary foods up to two years of age or beyond.

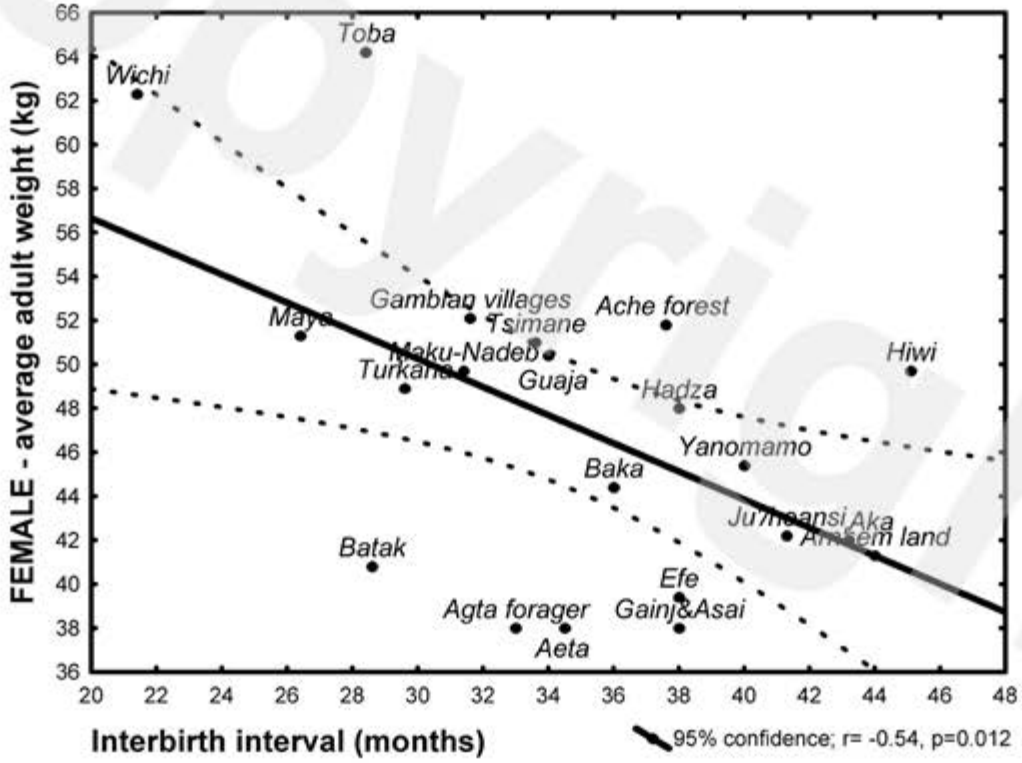
Anthropology of birth spacing

- Evolutionary approach:
  - Optimal relationship between maternal and infant condition versus number of offspring you can have over your lifespan= increased evolutionary fitness

- Biocultural approach:
  - Cultural practices impact length of lactation

Evolutionary approach

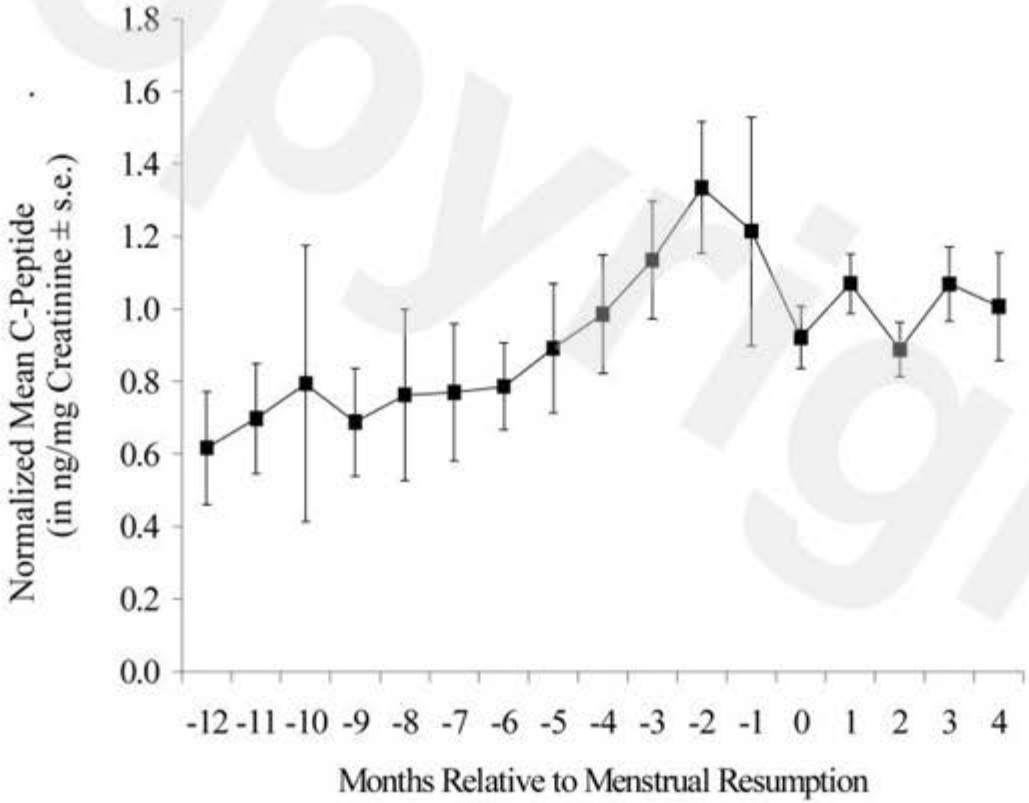
- Maternal condition (energetic status) in combination with nursing frequency impacts return to menstruation
- Women with greater energy stores will resume sooner



Gawick and Hochberg (2012). Lessons from the life history of natural fertility societies on child growth and maturation. Swiss Med Wkly. 2012;142:w13600

Energetics of Postpartum Amenorrhea

- Toba people of Argentina
- C-peptide – measure of insulin/energy availability

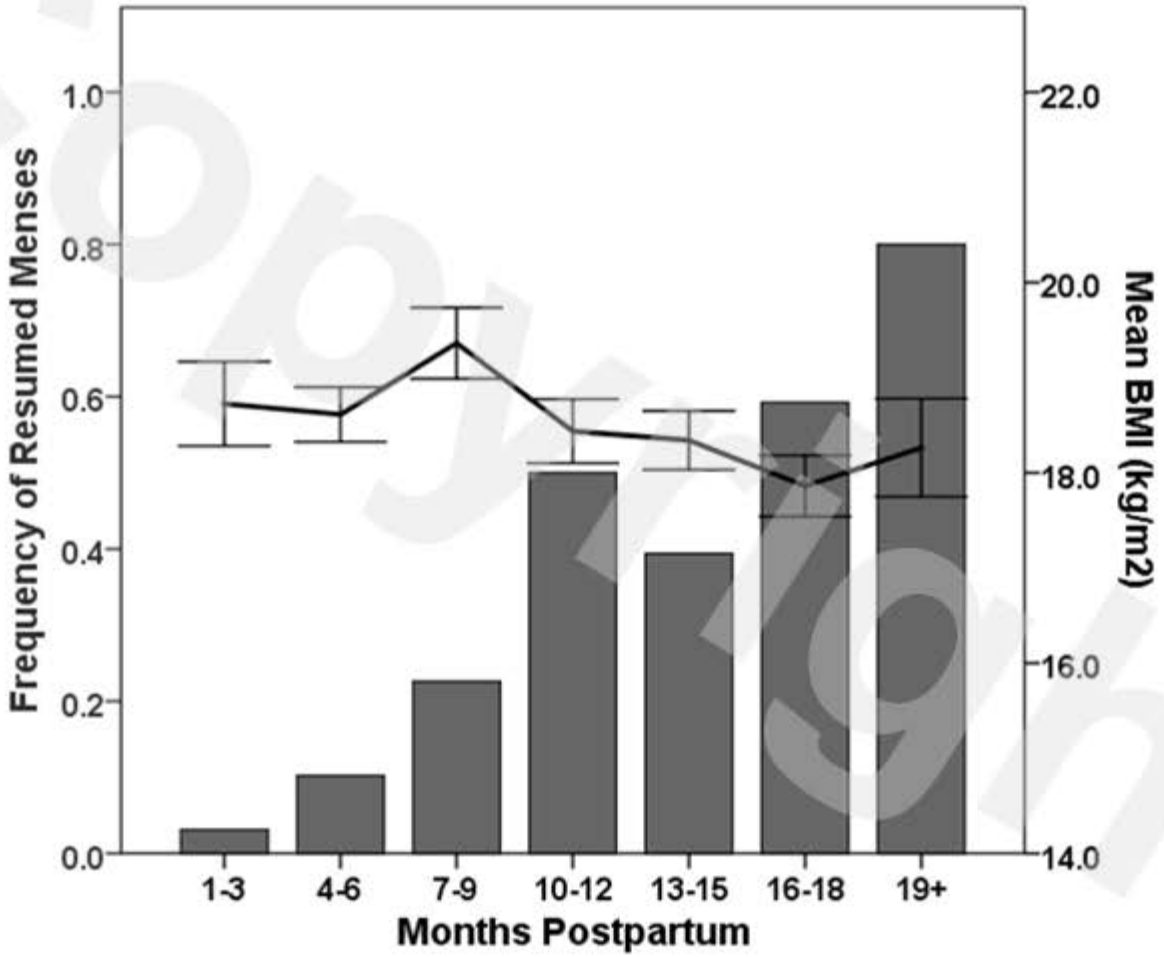


Valeggia & Ellison (2009). Interactions between metabolic and reproductive functions in the resumption of postpartum fecundity. Am J Hum Biol. 2009 Jul-Aug; 21(4): 559–566.

US vs. Ariaal woman

- Time to menstruation post birth

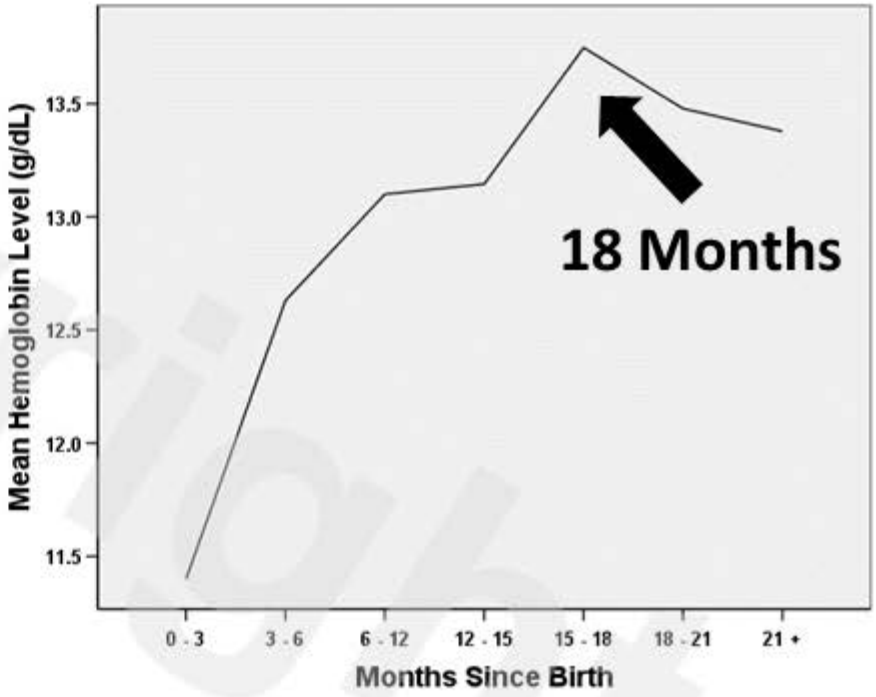
Ariaal: Return to menstruation and BMI: cross-section



Miller, & McConnell (2015). Milk immunity and reproductive status among Ariaal women of northern Kenya. *Ann Hum Biol*, 42 (1), 76-83.

Postpartum iron status

- Higher iron is associated with return to menstruation
- Iron peaks ~18 months
- Calculated mean interbirth interval: 28 months



Miller, EM (2010). Maternal hemoglobin depletion in a settled northern Kenyan pastoral population. *Am J Hum Biol*, 22, 768-774.

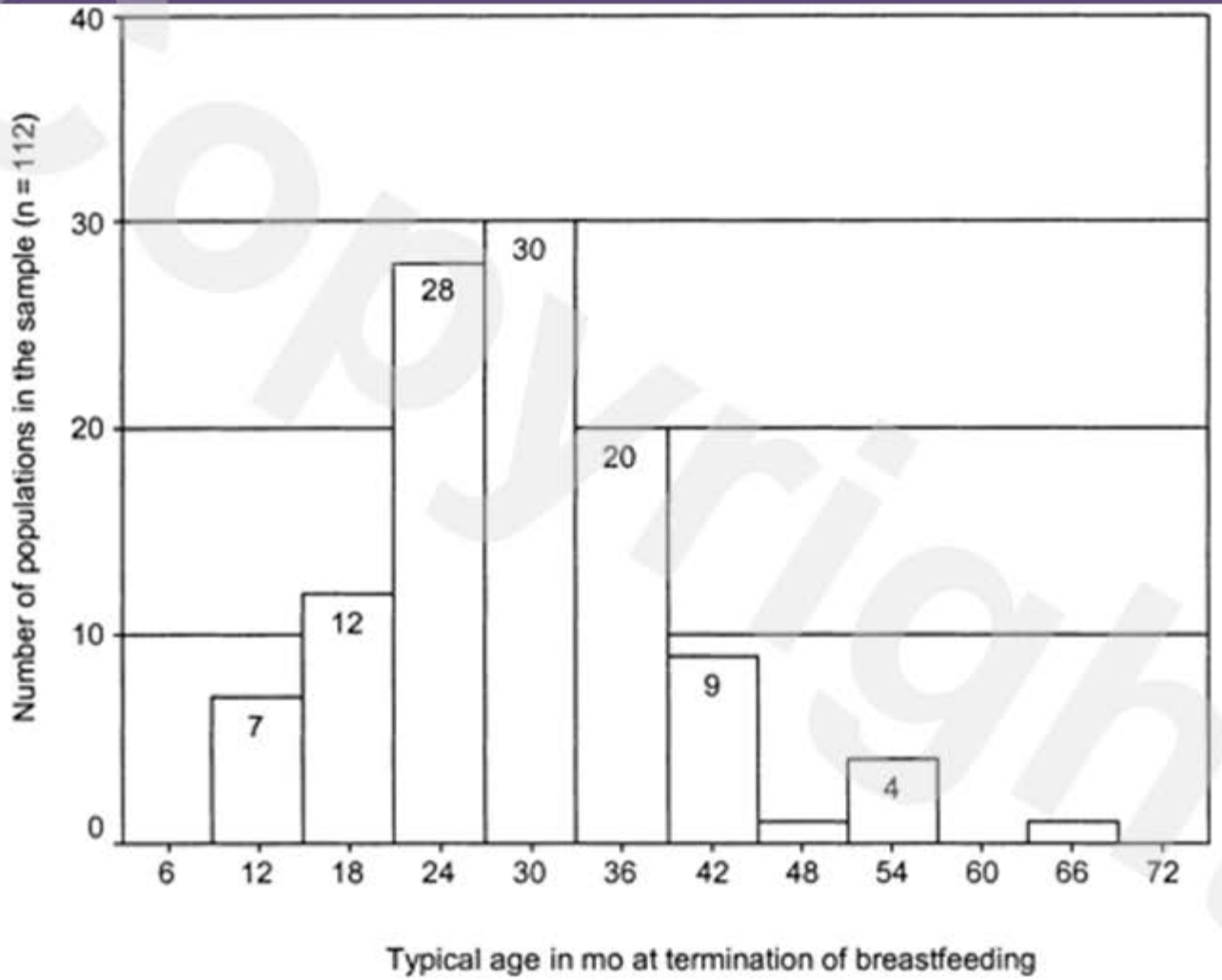
Evolutionary approaches

- Frequent suckling suppresses ovulation provided energy stores are low enough
- If energy stores are higher, perturbations to suckling frequency allow menstruation to resume quickly
- Therefore, maternal physiology creates optimal interbirth interval based on maternal energy status

Biocultural approaches

- Cultural practices impact suckling frequency and maternal condition
- E.g. Pumping & other US practices

Cross-cultural duration of breastfeeding



Sellen (2001). Comparison of infant feeding patterns reported for nonindustrial populations with current recommendations. J Nutr 131:2707-2715.

Biocultural approaches

- !Kung San: hunter-gatherer population in southern Africa
- Interbirth intervals are ~4 years

Biocultural approaches

- !Kung carry their children and their foraged food on their backs
- High loads increase interbirth interval
- Greatest offspring survival at IBI ~4 years

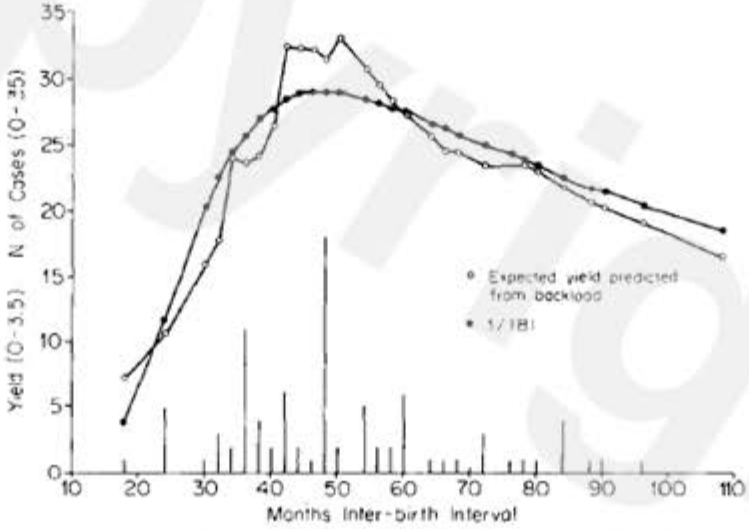


FIGURE 3. Graph of yield of surviving teenagers predicted by the best predictors (backload and 1/IBI), and bar chart of frequency of occurrence of each interbirth interval. Ungrouped data.

Blurton Jones (1986). Bushman birth spacing: A test for optimal interbirth intervals. Ethology and Sociobiology 7: 91-105

2. How long should I breastfeed my infant?

"How long" may be individualized, but will also vary based on cultural context

Table 7. Reasons Given by a Sample of 81 Mothers for Cessation of Breastfeeding

	Timing of Cessation Relative to Interview			
	Future		*Completed*	
*Principal Reason Given at Interview**	*n*	*(%)***	*n*	*(%)***
Household food availability				
When there is milk and rain	2	(4)	1	(2)
Little animal milk available	2	(4)	1	(2)
Maternal				
Maternal illness		—	5	(11)
Breast milk perceived as insufficient		—	1	(2)
Pregnancy		—	1	(2)
Mother went on a long journey		—	1	(2)
Infant				
Child "big enough"	30	(46)	14	(30)
Child able to walk	4	(6)	2	(4)
Child able to eat all foods other than breast milk	4	(6)	2	(4)
At least two of the above	13	(20)	6	(13)
Mother judges child "ready"	5	(9)	2	(4)
Eruption of first premolar teeth	1	(2)		—
Child illness		—	9	(19)
Child was very healthy		—	1	(2)
Not good to breastfeed for too long	2	(4)		—
Other				
Mother could identify no particular reason	1	(2)	1	(2)
Total number of responses recorded	64		47	

*Whenever mothers were unable to prioritize one of two given reasons, both are recorded.

**Percentages may sum to more than 100 because of rounding.

Most common reason: child is "big enough"

Datoga pastoralists of N. Tanzania

Sellen, D. W. (2001). *Journal of Human Lactation*, *17*(3), 233-244.

3. When should I add new foods?

World Health Organization

Exclusive breastfeeding is recommended up to 6 months of age, with continued breastfeeding along with appropriate complementary foods up to two years of age or beyond.

Adding foods among Datoga

Table 6. Reasons Given by a Sample of 60 Mothers for Introduction of Maize-Meal Porridge to the Diet of Their Most Recent Child

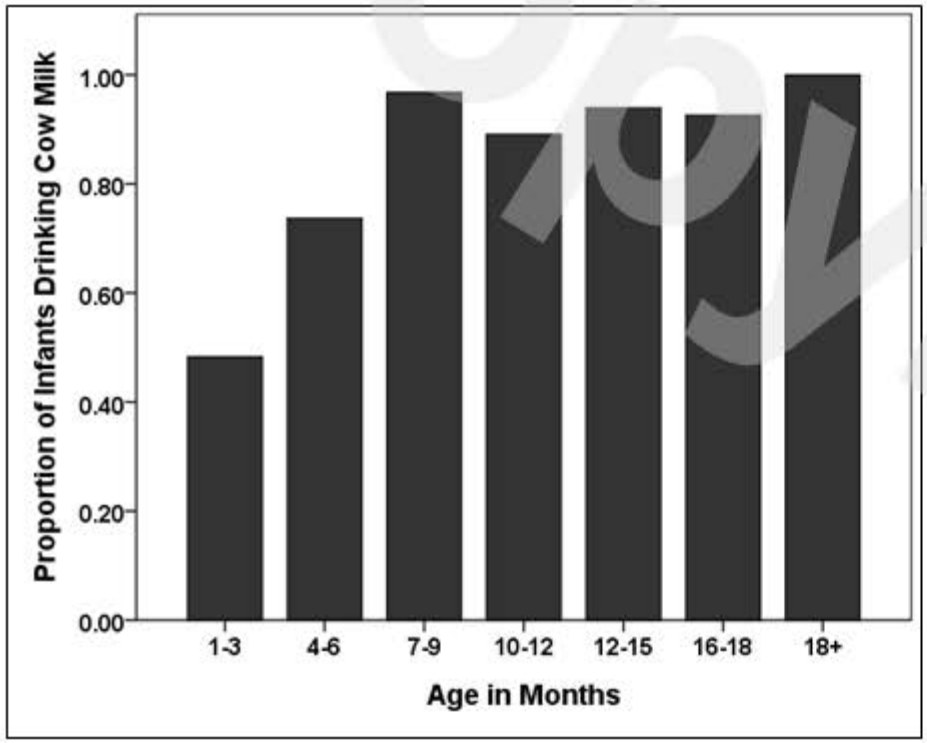
	Timing of Introduction Relative to Interview			
	Future		*Completed*	
*Principal Reason Given at Interview**	*n*	*(%)***	*n*	*(%)***
Household food availability				
Scarcity of cow's milk	1	(8)	12	(22)
Plentitude of cow's milk		—	2	(4)
Necessity to teach the infant how to eat solid foods before cow's milk becomes scarce	1	(8)	2	(4)
Cattle removed to dry season camps	1	(8)	1	(2)
Maternal				
Maternal illness	1	(8)		—
Breast milk perceived as insufficient		—	6	(11)
Infant				
Child "big enough"	4	(31)	11	(20)
Child began walking	1	(8)		—
On testing, child was found able to use other foods		—	3	(6)
Child wanted to eat with other children		—	2	(4)
Eruption of first premolar teeth		—	2	(4)
Child illness		—	2	(4)
Complementary foods deemed better for health		—	1	(2)
Other				
Onset of long rains	1	(8)		—
Mother could identify no particular reason	3	(23)	10	(19)
Total number of responses recorded	13		54	

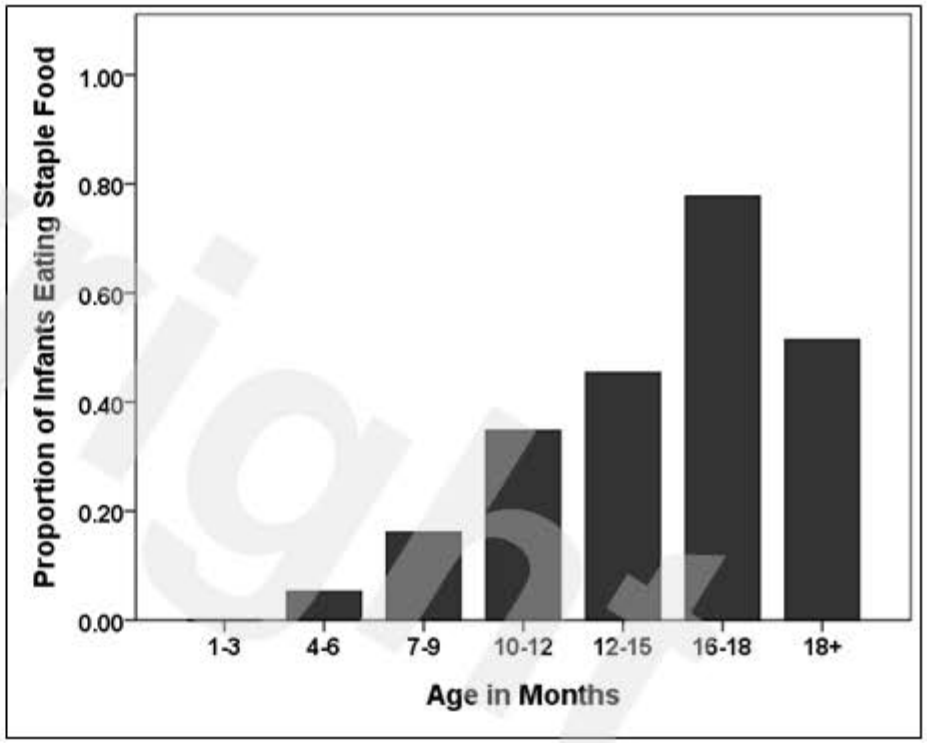
*Whenever mothers were unable to prioritize one of two given reasons, both are recorded.

**Percentages may not sum to 100 because of rounding.

Sellen, D. W. (2001). *Journal of Human Lactation*, *17*(3), 233-244.

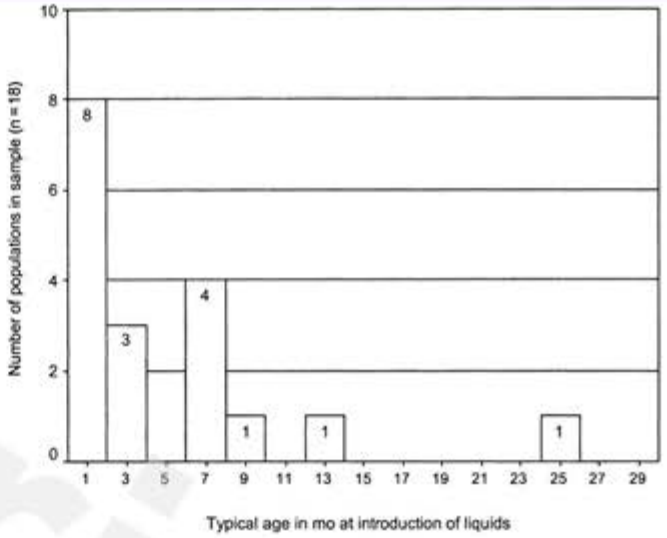
Ariaal weaning foods

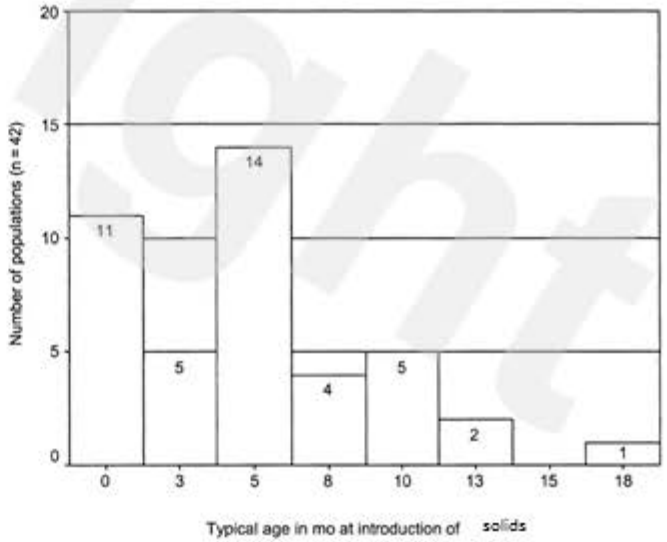




Cross cultural complementary feeding

- Most societies offer liquids and solids well before WHO recommendations

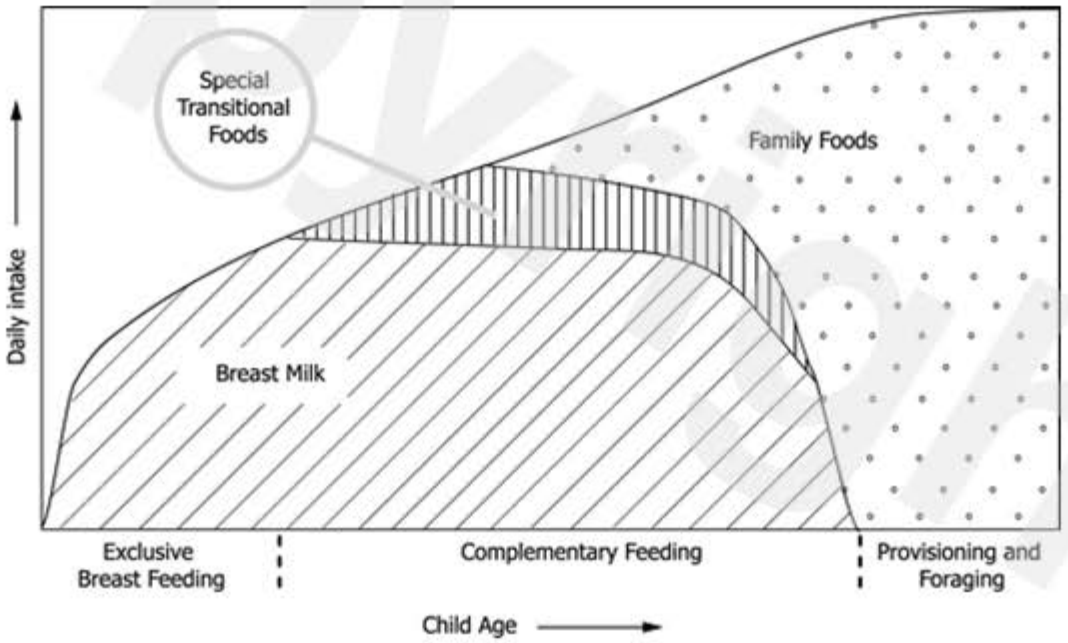




Sellen (2001). J Nutr 131:2707-2715.

3. When should I add new foods?

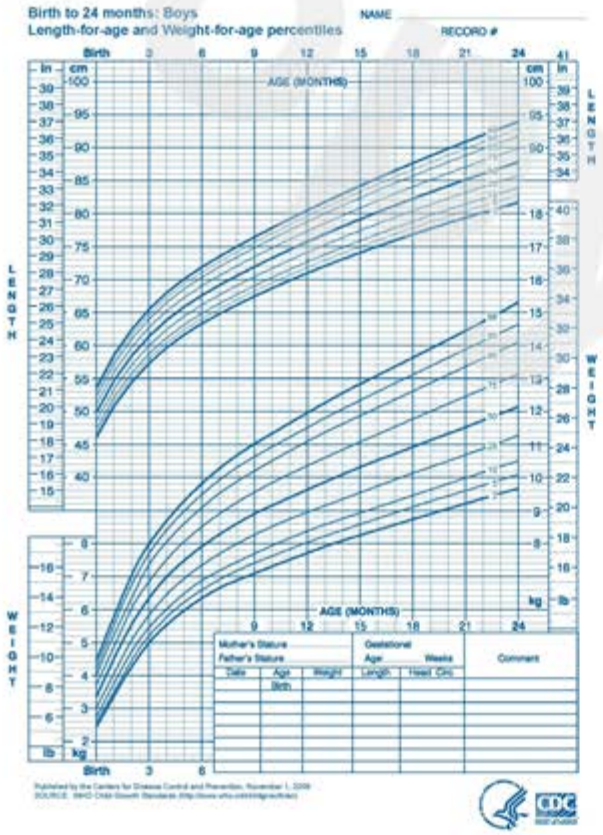
In some circumstances, exclusive breastfeeding must be shorter to meet the nutritional needs of infant

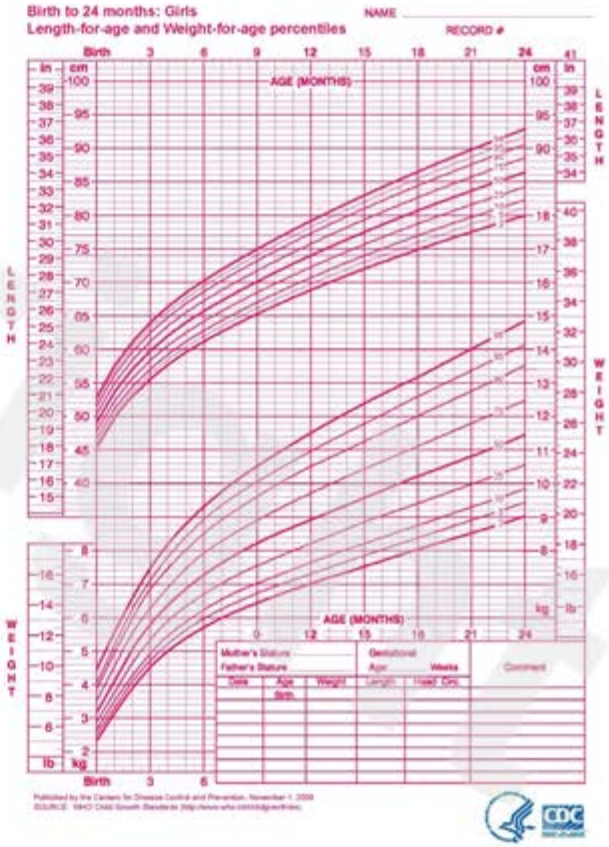


Sellen DW. 2007.
Annu. Rev. Nutr. 27:123–48

4. Is my breastfeed baby healthy/growing?

Growth curves can be culturally biased





Ariaal of Kenya

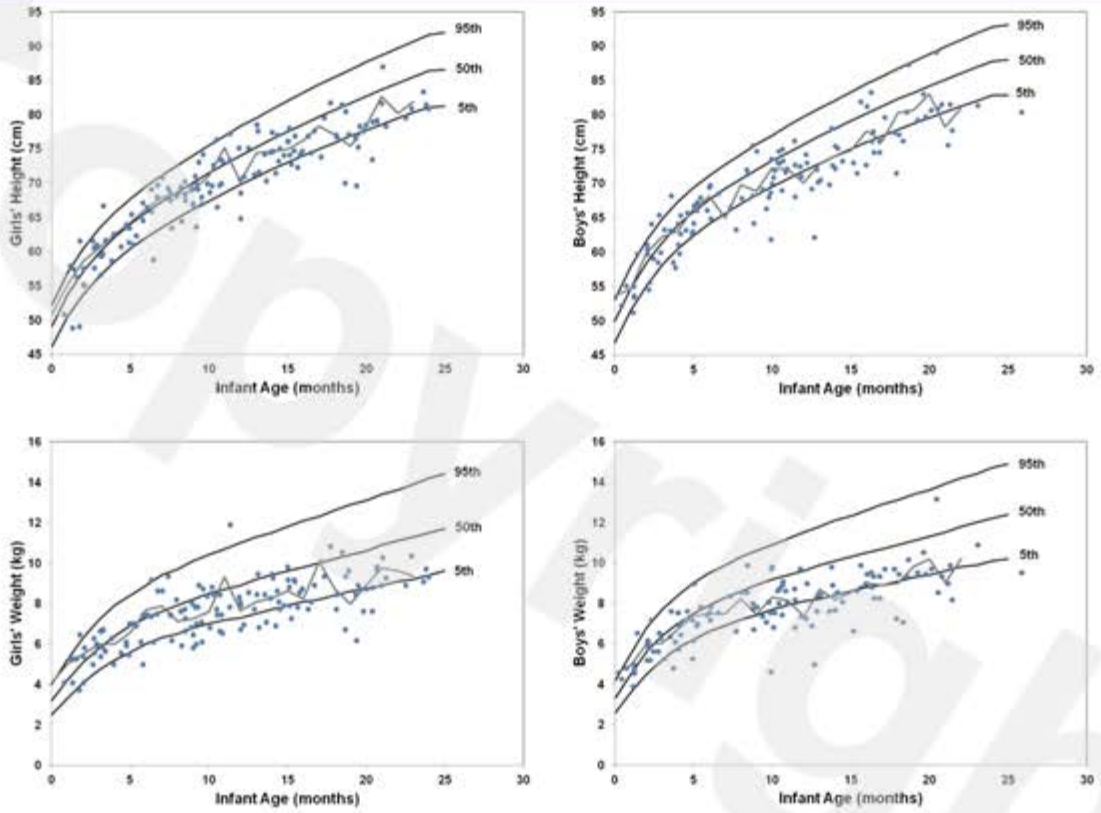
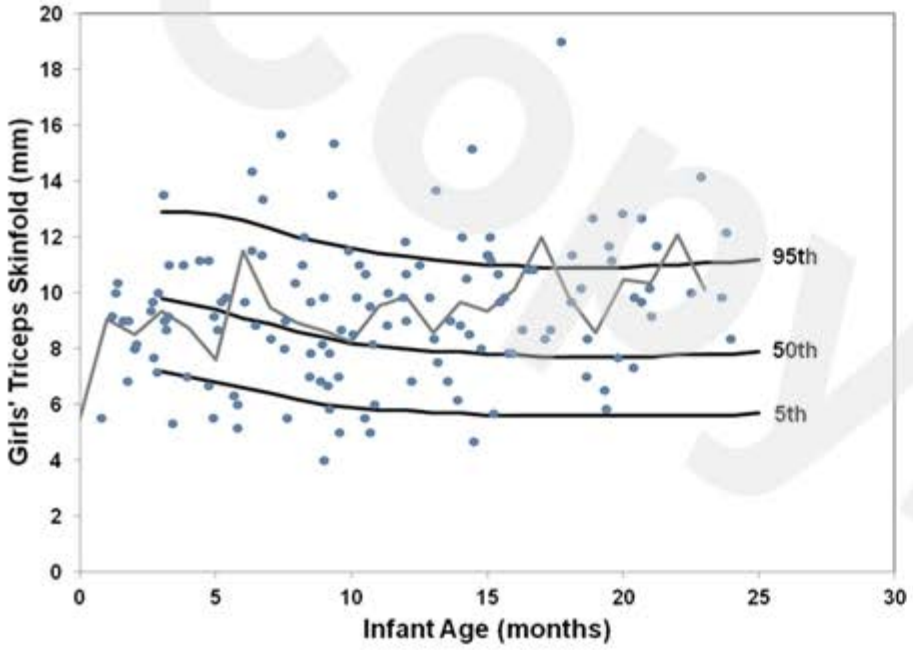


Figure 1. Ariaal infant length and weight by sex, across the postpartum period. Percentiles are based on the WHO Child Growth Standards (2006). *Dots* represent individual infants' measurements, while the *gray line* represents the moving average for the Ariaal population.

Miller, E. M. (2014). *American Journal of Physical Anthropology*, *153*(2), 286-296.

Ariaal infant fat



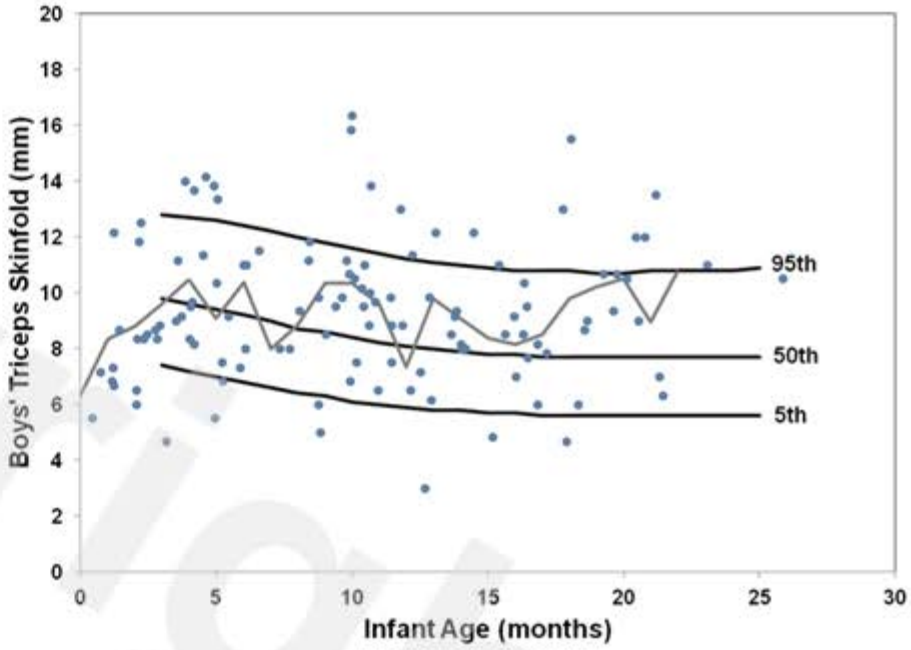


Figure 2. Ariaal infant triceps skinfold by sex across the postpartum period. Percentiles are based on the WHO Child Growth Standards (2006) for triceps skinfold, which begin at 3 months. *Dots* represent individual infants while the *gray line* represents the moving average for the Ariaal population.

Miller, E. M. (2014). *American Journal of Physical Anthropology*, *153*(2), 286-296.

Ariaal infant fat by nutritional status

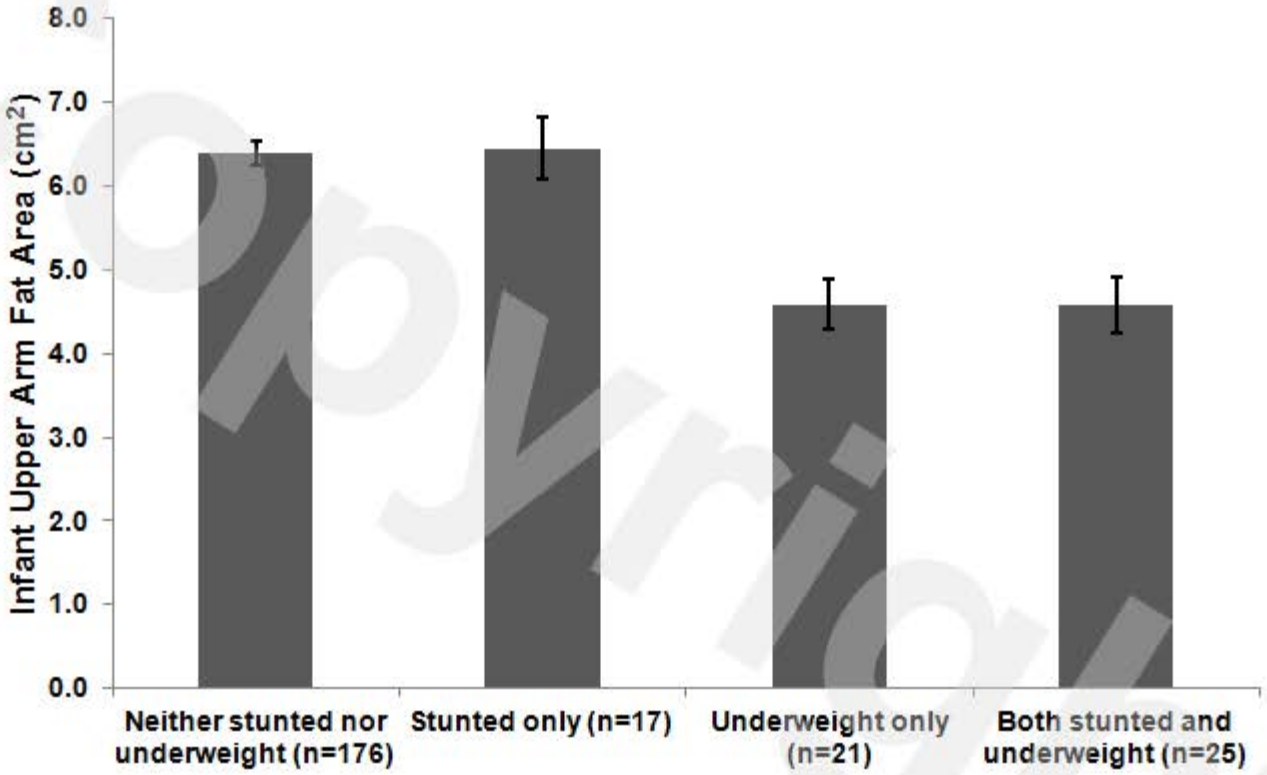


Figure 3. Infant UAFA by nutritional status. Infants are considered stunted with a LAZ less than −2, while infants are considered underweight with a WAZ less than −2. Infants in the underweight only and the both stunted and underweight categories have significantly lower infant UAFAs compared with infants who are not ($p > 0.0001$ for both). Stunted infants do not have significantly different UAFAs compared with infants who are not stunted.

Miller, E. M. (2014). *American Journal of Physical Anthropology*, *153*(2), 286-296.

Ariaal fat and length gain by cow's milk consumption

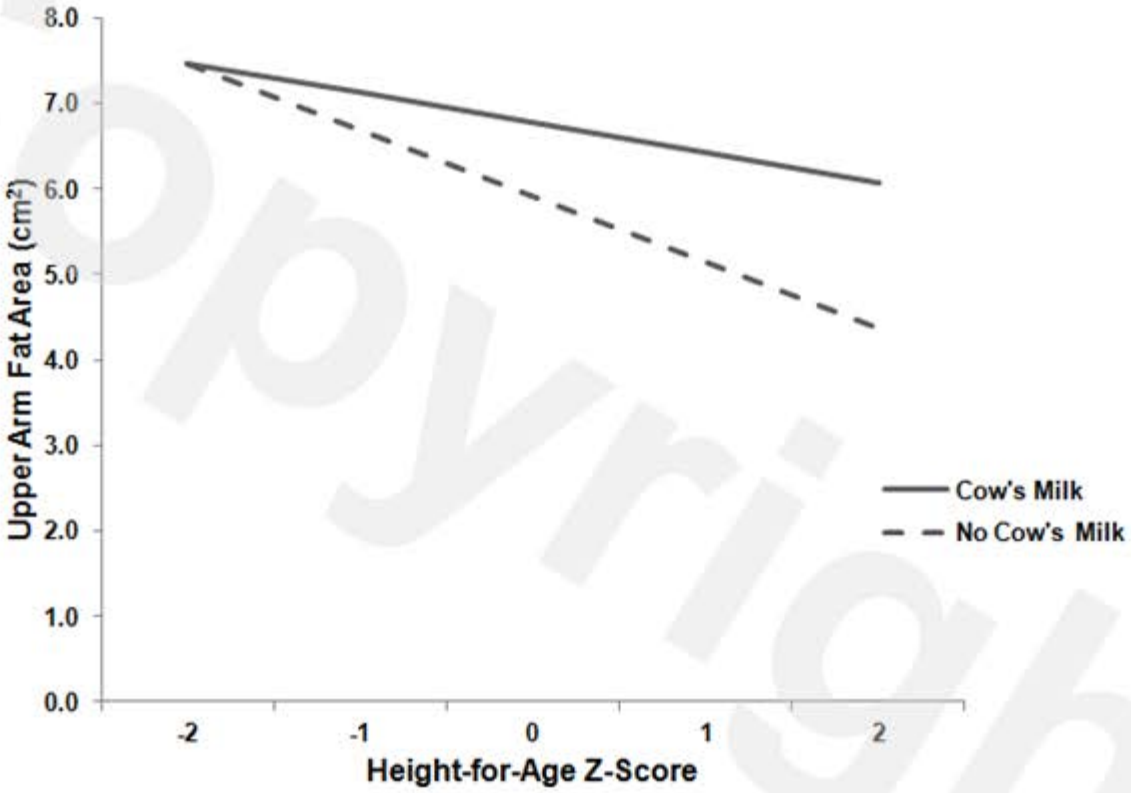


Figure 4. Interaction between drinking cow's milk, LAZ and UAFA based on regression coefficients in Table 2.

Miller, E. M. (2014). *American Journal of Physical Anthropology*, *153*(2), 286-296.

4. Is my breastfeed baby healthy/growing?

- Culture-specific breastfeeding patterns and milk use leads to growth that preferentially deposits fat over gaining length in Ariaal babies

- Of note: Formula fed infants are generally shorter and fatter than exclusively breastfed infants

Conclusion

- Anthropologists have much to add about the culture of breastfeeding
- Understanding worldwide variation in breastfeeding practices can help normalize variation in clinical practices