Chapter 6, p. 207-208 & AND Position Paper  Lactation

Key Nutrition Concepts

Human milk is the best food for newborn infants.

Breastfeeding in beneficial for baby, mother & society

Adequate milk supply is monitored by infant growth and # of soiled diapers/d.

When maternal diet is inadequate, the quality of the milk is preserved, maybe not the quantity.

Infants may need additional vits K & D and fluoride & iron

Health care policies, societal attitudes, family support and work environment affect BF rates.

Hormonal Control of Lactation

Prolactin

Stimulates milk production

Released in response to suckling, stress, sleep & sexual intercourse

Oxytocin

Stimulates letdown (release)

Tingling of the breast from contractions in milk duct

Causes uterus to contract, seal blood vessels & shrink in size

Human Milk Composition

Human milk is the only food needed by most infants for ~ 6 months

Provides nutrition

Immune protection

Protection from chronic Dz

The composition changes over a single feeding, over a day, based on age of the infant and infant needs

Colostrum

Milk secreted during the first few days postpartum

Very high in proteins such as secretory IgA & lactoferrin

From **Table 6.2** Compositions of 100 mL colostrum (days 1-5 postpartum) and mature milk (day 15 postpartum)

Water and Energy in Human Milk

Water

Major component in human milk

Isotonic with maternal plasma

Energy

~ 0.65 kcal/mL (~ 22 kcals/oz) but varies with fat, protein and carbohydrate composition

More calories than human milk substitute (HMS) and cow’s milk

Mature milk  Foremilk & Hindmilk

First milk during a feeding

Watery for hydration

Low lipid content

Some CHO

More rich in lipid for energy

Higher CHO

Lipids in Human Milk

Lipids—provides ~40-80% of kcals depending on duration of feeding

FA profile reflects maternal diet

DHA

Essential for retinal development

May be associated with higher IQ scores

Cholesterol

Higher in human milk than HMS

Early consumption of cholesterol through breast milk may be related to lower blood cholesterol levels later in life (previous edition)

Proteins in Human Milk

Total proteins

Lower than in whole cow’s milk (0.32 vs. 0.98 g/oz)

Have antiviral & antimicrobial effects

Affected most by age of infant

Casein

Main protein in mature human milk

Promotes calcium absorption

Whey

Liquid – immunoglobulins, lactoferrin for Fe- absorption

Non-protein nitrogen

Used to make non-essential amino acids & hormones

Milk Carbohydrates

Lactose

Enhances calcium absorption

Oligosaccharides = medium length poly

Second most abundant CHO

Prevent binding of pathogenic microorganisms to gut, which prevents infection & diarrhea

Vitamins & Minerals of concern

Vitamin A, D, E & K

Water soluble vits in general

Content reflective of mother’s diet

Vitamin B12 and folate

Low B12 seen in women who:

are vegans or malnourished

have had gastric bypass

Minerals: concentration related to age of baby

contribute to osmolality

Most have high bioavailability

Very low risk of anemia despite low iron content of human milk

Benefits for Mom

Hormonal benefits

Oxytocin stimulates uterus to contract

Physical benefits

May delay monthly ovulation

Lower rates of breast & ovarian CA and rheumatoid arthritis

**May** speed fat and wt loss

Psychosocial benefits

Increased self-confidence

Bonding with infant

Cheap

Fewer sick-baby days

Benefits for Infants

Nutritional benefits: dynamic, matches needs

Immunological benefits

Lower infant mortality

Reduces SIDS

Reduction in acute & chronic illnesses

Cognitive benefits

Benefits to Society

Decreased need for medical care

Renewable resource

No pollution

Spacing kids out

Good for mom & baby

The Breastfeeding Infant

Supply will = demand

Milk synthesis is related to:

Degree of emptying

Breast size does not dictate production, only storage.

Optimal duration of breastfeeding

AAP & AND 1 year or longer

U.S. Surgeon General exclusively for 6 months & best to breastfeed for 12 months

Reflexes & Cues

Gag reflex—prevents infant from taking things into lungs

Oral search reflex—infant opens mouth wide when close to breast & thrusts tongue forward

Rooting reflex—infant turns to side when stimulated on that side

Identifying hunger and satiety cues

Infant bringing hands to mouth, sucking on them & moving head from side to side (rooting) = hunger

Crying = late sign of hunger

Allow infant to nurse on one breast as long as he/she wants to ensure hindmilk for satiety

Infant Recommendations AAP

Tooth decay

See dentist by 12 mos

Vitamin supps

Vit K @ birth

400 IU/d vit D starting @ 2 mos

600 IU vit D @ 1 yr

Fluoride after 6 mos, prn. Mom supplements diet.

Fe- depending

Maternal Diet

MyPlate for pregnant and breastfeeding women

Dietary Guidelines

Moderate weight reduction can be achieved without compromising the weight gain of the infant

Appropriate balance of nutrients at specified calorie levels for each stage of breastfeeding

https://www.choosemyplate.gov/moms-pregnancy-breastfeeding

Maternal Energy Balance during Lactation

E cost: 500 kcal/day for the 1st 6 months & 400 kcal/d afterward

DRI: possibly +330-400 kcal/d for -0.8 lb/mo weight loss but highly individualized

Protein-calorie malnutrition

results in reduction in volume

Weight loss during breastfeeding

Most women do not reach prepregnancy weight by 1 year after birth

Modest or short-term energy reductions do not decrease milk production

Exercising and Breastfeeding

Modest energy restriction + increased activity may = weight & body fat

Exercise does not inhibit milk production or infant growth

Aerobic activity enhances maternal fatty acid mobilization differently than during calorie restriction

Other Factors of Maternal Diet

Vitamin and mineral supplements

Not needed for those eating a balanced diet

Fluids

Women should drink to keep urine pale

Vegans: B12

Of concern: kcals, protein, Ca, vit D, Fe, Zn

Components of maternal diet may be linked to **colic**.

Culprit foods: cow’s milk, eggs, peanuts, tree nuts, wheat, soy, fish, cruciferous vegetables & chocolate

Breastfeeding Goals for the United States

Who shouldn’t BF

Babies with galactosemia

Illicit drug use

TB

HIV/AIDS

Breastfeeding  Promoters Barriers

Support provided by health care system

Prenatal breastfeeding education

Lactation support in hospitals and birthing centers

Lactation support after discharge

The work place

The community

Lactation problems

Embarrassment

Time & social constraints

Lack of support from family & friends

Lack of confidence

Employment & child care

Concerns about diet & health

Fear of pain

Lack of BF knowledge