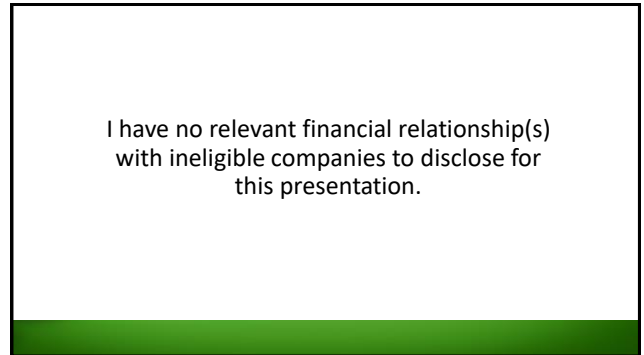
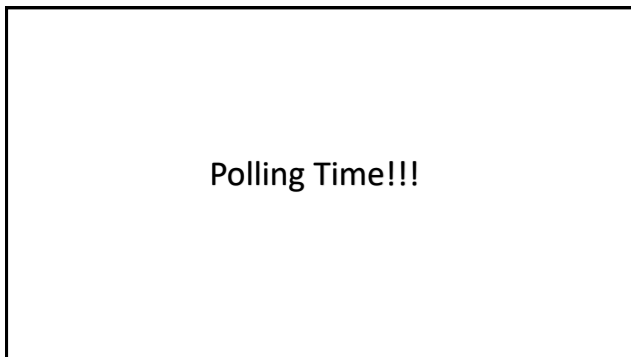




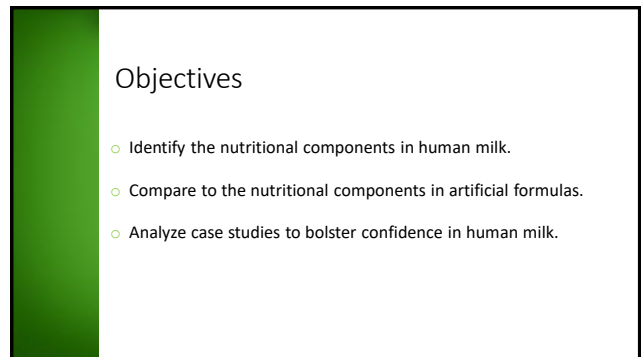
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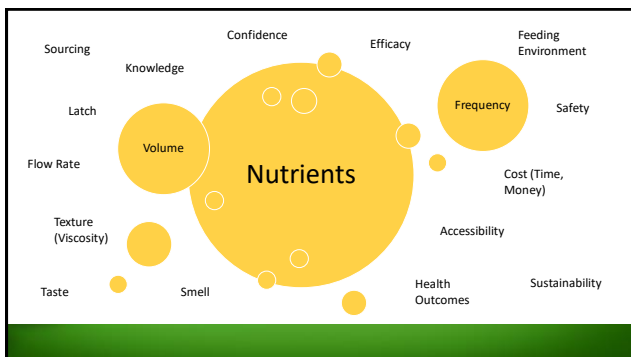
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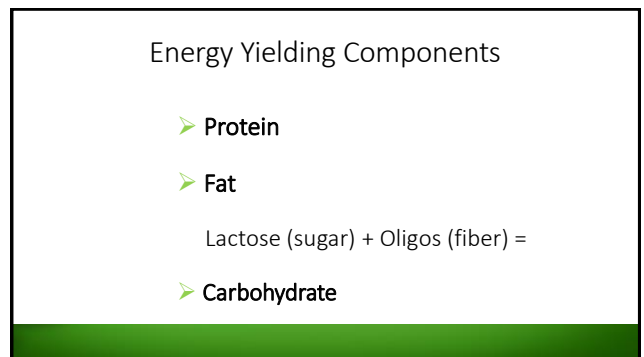
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5



6

Polling Time – Protein

7

Protein Amount

Lowest Protein of all Mammals
Slowest Body Growth

Higher Protein (3x protein)
Double Weight (4x Faster)

Highest Protein (15x more)
Infrequent Nursing (1-2x per day)
Double Weight (20x Faster)

Dasgupta, 2015
Skibiele, 2013

8

Protein ~1 g/dL

- 4 Calories/gram
- 5-10% of energy content
- Building block for lean tissue
- Protein digesting and protecting enzymes

Lusk, 2022
Fenton and Elmayer, 2021
Kim and Froh, 2012

9

Protein Source

Human

- Others from food, contact, or air?

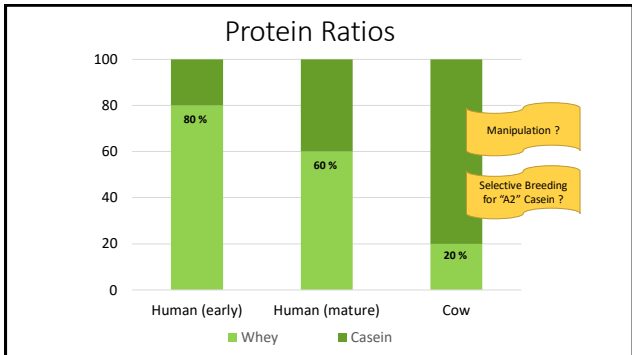
Other Animal Species

- Cow
- Goat

Plant

- Soy
- Toddler: Pea, Almond, Buckwheat

10



11

Protein Hydrolysis

Intact

Partially Broken Down

Extensively Broken Down

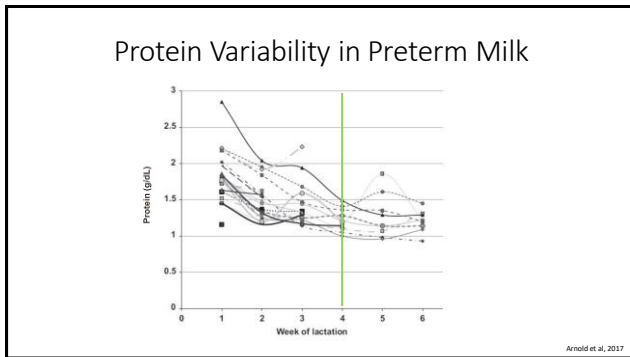
Amino Acid (Elemental)

Hypoallergenic (Europe)

Hypoallergenic (US)

**Hydrolysis using heat vs pork enzyme (not Halal or Kosher OU-D)
**Impacts taste and osmolality

12




13




14


Fat Amount



Lowest Fat (15x less)
Long Nursing Duration (2 Years)
Dry Environment



Moderate Fat
Moderate Duration Nursing (~4 years)
Keep Young Close for Warmth



Highest Fat (15x more)
Shortest Nursing Duration (4 days)
Hostile Environment

Dargupta, 2015
Skibell, 2013

15

Fat ~3-4 g/dL


- 9 Calories/gram
- 50% of energy content
- Building block for nervous system
 - Unique triglyceride form
 - Fat globule size increases
 - Cholesterol
- Lipase enzyme

Fenton and Elmrayed, 2021
Kim and Froh, 2012

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Fat Source

Human



Plant

- Soybean Oil
- Safflower Oil
- Sunflower Oil
- Coconut Oil (source of MCT Oil)
- Palm Olein Oil
- Also: Canola Oil

Other Animal Species


- Cow

**Liquid formulas include an added emulsifier

17

MCT Oil

Human Milk



Standard Formulas

Enhanced Formulas

Specialty Formulas and Supplements

**Requires least digestion, used for fat malabsorption

**Does not contain essential fatty acids

18

DHA (Omega-3) and ARA (Omega 6)

<p>Human Milk</p> <ul style="list-style-type: none"> • Natural production • Enhanced by intake of low mercury oily fish, walnut, flax/chia seeds 	<p>Formulas</p> <ul style="list-style-type: none"> • Algae (C Cohnii) oils • Fungal (M Alpina) oils • Fish oil (Europe)
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Embleton & Berrington, 2022

19

Foremilk/Hindmilk: Yes

Foremilk	Hindmilk	Average
~1 g/dL 13 kcal/oz	~9 g/dL 33 kcal/oz	~23 kcal/oz

Prior Full Expression

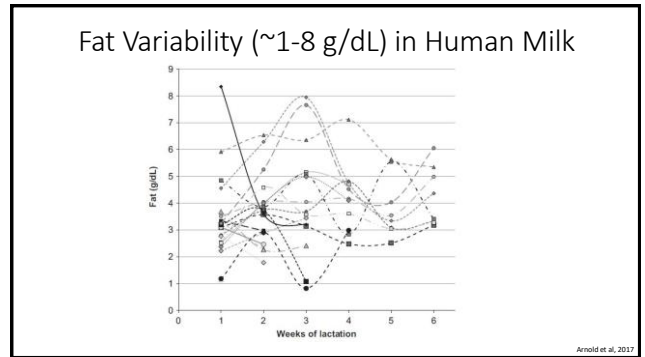
20

Foremilk/Hindmilk: No

Foremilk	Hindmilk	Average
~7 g/dL 30 kcal/oz	~6 g/dL 27 kcal/oz	~28 kcal/oz
~10 g/dL 34 kcal/oz	~6 g/dL 23 kcal/oz	~29 kcal/oz

Prior Incomplete Expression

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Bonus Slide: Using Early Milk

- **Colostrum** in order, even if frozen
 - Considered first 3-4 days
- Then ~50% **oldest frozen milk** + ~50% **fresh**
 - "FIFO" highest protein, early bioactive factors

Especially for preterm infants, suggest using up first 3-4 weeks frozen milk (at 50%) before switching to all fresh.
If possible, consider using first 4-6 weeks frozen milk (at 50%) if/when not directly nursing.

Meier et al, 2010

23


Polling Time – Carbohydrates

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Carbohydrate Amount



2/3 x Carbohydrates
Smaller Brains
More Immunity Passed In Utero



Moderate Carb
Complex Brains
High Need for Immune Protection



Highest Protection (10x oligos)
Pouch Living (germs)

Dasgupta, 2015
Skibel, 2013

25


Carbohydrates ~7-8 g/dL

- **45% of Energy Content**
- **Lactose (energy) 4 Calories/gram**
 - Important energy source, ~5-6.5 g/dL
- **Oligosaccharide (protective fibers) 2 Calories/gram**
 - Important for gut biome, ~1.5-2 g/dL (or ~150-200 mg/dL)
- **Amylase enzyme**

Fenton and Elmeyed, 2021
Kim and Froh, 2012


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Energy Source

<p>Lactose (glucose + galactose) • Human or Cow Milk</p>	<p>Sucrose (glucose + fructose) Corn Syrup or Maltodextrin Tapioca Starch Potato Starch</p>
	<p>Lactose (glucose + galactose) • Goat Milk (Europe)</p>

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Protective Fiber Source

<p>HMOs (human milk oligosaccharide) • >200 unique types • 150-200 mg/dL</p>	<p>GOS (galacto-oligosaccharide) FOS (fructo-oligosaccharide) PDX (polydextrose) Cow Milk HMOs • 0-5 unique types • 25 mg/dL</p>
	

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Energy Yielding Components

- ~1 g/dL Protein
- ~4 g/dL Fat

Lactose (sugar) + Oligos (fiber) =

- ~8 g/dL Carbohydrate

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is the exact substitute science has found for baby's natural food. At every stage in its preparation no trouble or expense has been spared to make it perfect. It is rich in natural sunshine vitamins and bone and teeth and body building elements. Be a true mother and get the world's best for your baby.

"MOTHERHOOD"
The most suitable food for infants and nursing mothers. It is made from the finest milk, with the most perfect sterilization, and contains the most perfect food for infants and nursing mothers. It is the best food for infants and nursing mothers.

"THE FOOD OF ROYAL BABIES"

31

GOOD HOUSEKEEPING MAGAZINE—THE HOME DIRECTORY 31

Baby Payer
Hartford, Conn.

"BASED ON IT"

Don't Wait Too Long Before You Wean the Baby

IF YOU do the little one is likely to be weak and anemic. Mother's milk is, of course, the best food for young babies, but the time comes when it isn't sufficient for the fast-growing body. Doctors say that this is when the baby is about six months old.

Please send me, free, your book and trial package.

32

But how is a mother to know whether the milk she is giving to her wee mite does not contain the dreaded germs of tuberculosis? How can she be sure that baby's food contains those all-important growth-promoting Vitamins — which doctors say babies must have if they are to grow and develop properly?

There is only one way in which a mother can be absolutely sure.

has been used in Municipal Health Departments, Schools for Mothers, and Crèches all over the United Kingdom

Special Offer!

33

Why we have the youngest customers in the business

34

Infant Formula – \$3.9 Million Business (2020)

Introducing Our Biggest Formula Breakthrough

Closer to Breast Milk Than Ever Before

ADVANCED COMPLETE NUTRITION

CLINICALLY SHOWN

perfect for newborns

EXCLUSIVE

THE PERFECT BOTTLE®

NON GMO

NO ARTIFICIAL GROWTH HORMONES

EXPERTS READY TO HELP

AfterCare

Get Up to \$400* in Great Offers!

#1 BRAND IN INFANT NUTRITION

#1 FORMULA BRAND IN EUROPE

Recommended Formula Brand by Moms for Moms®

#1 SELLING BRAND FOR BRAIN BUILDING & IMMUNE SUPPORT

#1 BRAND RECOMMENDED FOR INFANTS

Best Fat in Hospitals

35

Contains Prebiotics + Probiotics

Next best to mother's milk

For healthy immune system

For sensitive digestive systems

1 Selling Brand

goat's milk **esbilac** puppy milk replacer

ESBILAC puppy milk replacer

esbilac puppy milk replacer

esbilac puppy milk replacer

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UN News
Search the United Nations
Baby formula marketing 'pervasive, misleading and aggressive' – UN report

USNews NEWS
Infant Death Linked to Contaminated Breast Pump: CDC
March 3, 2023

RECALL

- Parent's need support – early and often
- There are more supplementing options than marketing suggests

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Please read the following notice

Most healthcare professionals agree that breastfeeding is preferable to bottle feeding because it has many benefits for both you and your baby.

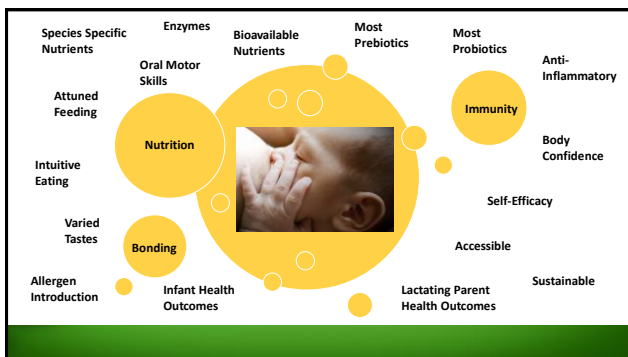
If you are considering changing over from breastfeeding or combining breast and bottle feeding, you are advised to talk to your midwife or health visitor first. Once the decision to stop breastfeeding has been made, it may be difficult to go back. Partial bottle feeding with an infant formula milk, especially in the first few weeks of life, may also reduce the supply of your breast milk.

If you choose to bottle feed, it is very important that you use an infant formula milk throughout the first year.

Please ensure that you follow all usage instructions very carefully.

CONTINUE

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Conclusions

- Human milk contains species-specific types and amounts of nutrients.
- Artificial formulas are still being formulated.
- Must look at bigger picture to support direct breast/chest feeding.

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Questions?

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