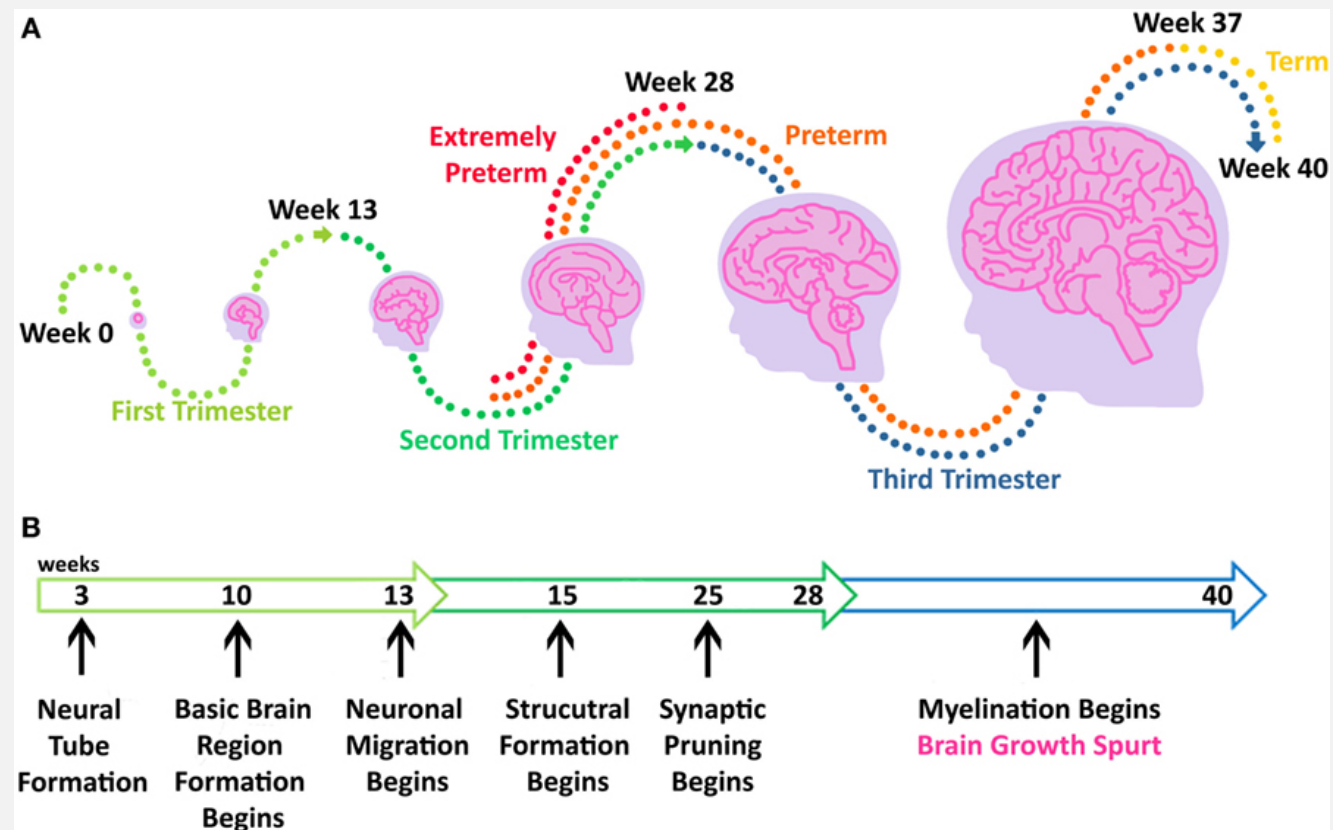




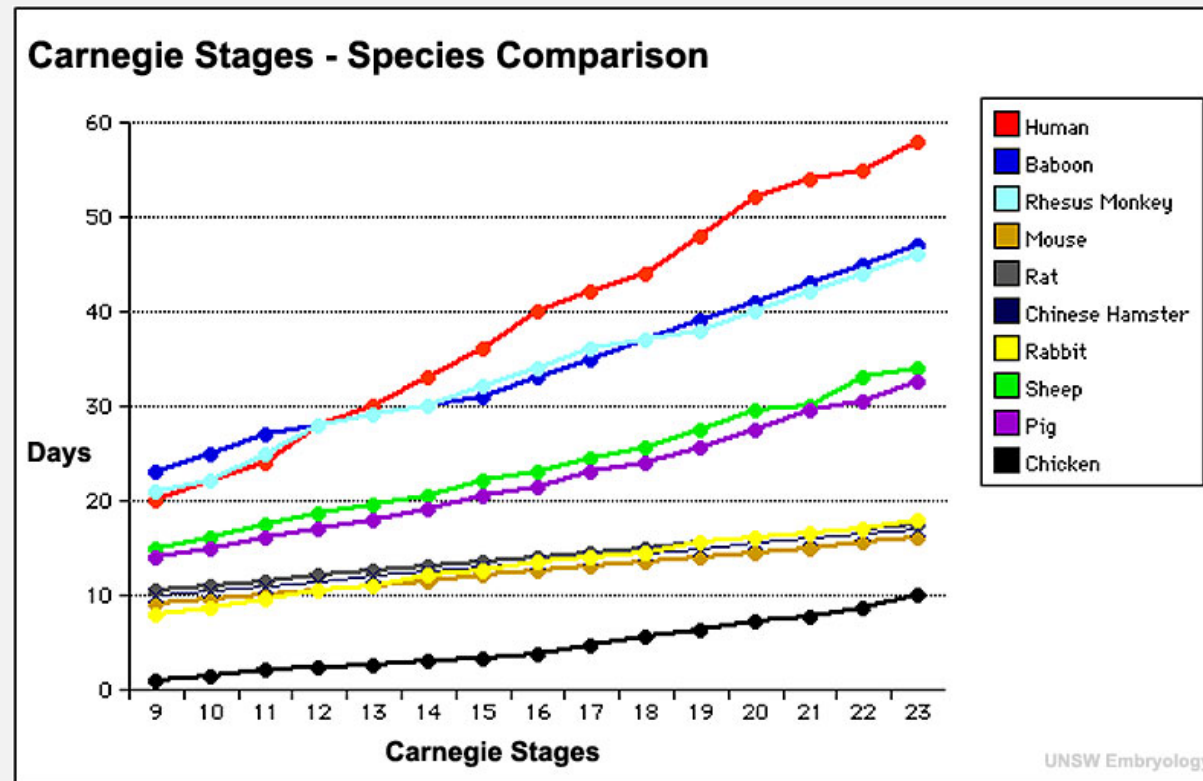
# EARLY LIFE NUTRITION AND BRAIN HEALTH

**Corinne Cannavale, B.S.**  
**Nutrition, Wellness, and the Brain**  
**Week 2**

# BRAIN DEVELOPMENT THROUGH PREGNANCY AND INFANCY



# STUDYING PRENATAL AND INFANT BRAIN DEVELOPMENT



# NUTRITION AND PRENATAL BRAIN DEVELOPMENT



## Protein

- Proper neuron & cell growth



## Copper

- Building neurotransmitters



## Iron

- Helps create insulation for neurons



## Choline

- Building neurotransmitters
- Helps with DNA synthesis
- Helps create insulation for neurons



## Zinc

- Helps with DNA synthesis
- Building neurotransmitters



## Poly-unsaturated Fatty Acids

- Supports neuron development
- Helps insulate neurons

# IMPORTANT NUTRIENTS CONTINUED - SUPPLEMENTS



## **DHA**

- Neuron Insulation
- Neuron Development



Diet alone may not adequately cover all nutrients needed during pregnancy!  
A prenatal supplement containing folic acid and DHA is recommended to support brain development.



## **Folic Acid**

- Neuron development

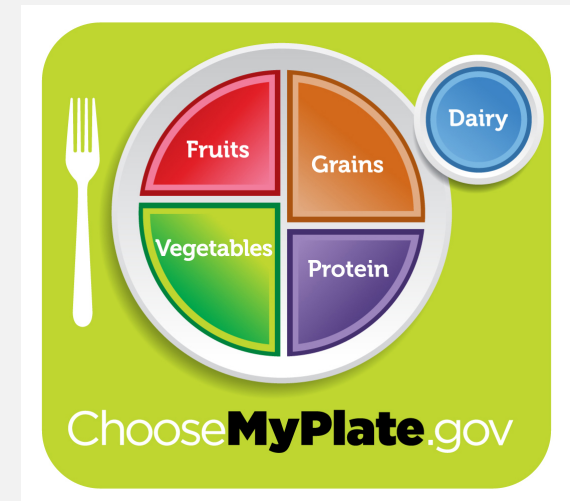
# SCIENCE IS ABOUT ASKING QUESTIONS!

## We are still learning!

- When it comes to optimal brain health, there are no outlined nutritional recommendations
- A good rule of thumb

*Heart Health = Brain Health*

- Outlined nutritional recommendations will suggest healthy diet patterns which can promote healthy heart and metabolic health



<https://www.choosemyplate.gov/resources/MyPlatePlan>

# BREAST MILK

- Human breast milk contains a variety of nutrients which are important for development
- While we are still learning about nutrition and brain development, we can learn a lot from studying breast milk to create good substitutes with formula



Carotenoids, nutrients that give pigment to plants, are found in breast milk at high levels in days following birth, but at lower levels later on. We can visually see this in the color of colostrum at 3, 5, 6, and 25 days after birth.

# BREASTMILK & INFANT FORMULA

- Infant formulas differ in the nutrient composition

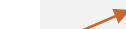
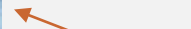


## Formula 1

NUTRIENTS (Normal Dilution); per 100 Calories (5 fl oz)	
PROTEIN	g 2
FAT	g 5.3
CARBOHYDRATE	g 11.3
WATER	g 100
LINOLEIC ACID	mg 800
VITAMINS	
A	IU 300
D	IU 60
E	IU 2
K	mcg 9
THIAMIN (B <sub>1</sub> )	mcg 80
RIBOFLAVIN (B <sub>2</sub> )	mcg 140
B <sub>6</sub>	mcg 60
B <sub>12</sub>	mcg 0.3
NIACIN	mcg 1000
FOLIC ACID (FOLACIN)	mcg 16
PANTOTHENIC ACID	mcg 500
BIOTIN	mcg 3
C (ASCORBIC ACID)	mg 12
CHOLINE	mg 24
INOSITOL	mg 6
MINERALS	
CALCIUM	mg 78
PHOSPHORUS	mg 43
MAGNESIUM	mg 8
IRON	mg 1.8
ZINC	mg 1
MANGANESE	mcg 15
COPPER	mcg 75
IODINE	mcg 15
SELENIUM	mcg 2.8
SODIUM	mg 27
POTASSIUM	mg 108
CHLORIDE	mg 63

## Formula 2

NOT FOR INFANTS OR CHILDREN WITH GALACTOSEMIA					
NUTRIENTS per 100 Calories (5.3 fl oz, prepared as directed)					
PROTEIN	2.07 g	CARBOHYDRATE	10.7 g	LINOLEIC ACID	1000 mg
FAT	5.60 g	WATER	141 g		
VITAMINS					
VITAMIN A	300 IU	VITAMIN B <sub>1</sub>	63 mcg	BIOTIN	4.6 mcg
VITAMIN D	75 IU	VITAMIN B <sub>2</sub>	0.26 mcg	VITAMIN C (ASCORBIC ACID)	9 mg
VITAMIN E	1.5 IU	NIACIN	1100 mcg	CHOLINE	24 mg
VITAMIN K	8 mcg	FOLIC ACID (FOLACIN)	16 mcg	INOSITOL	4.9 mg
THIAMIN (B <sub>1</sub> )	100 mcg	PANTOTHENIC ACID	470 mcg		
RIBOFLAVIN (B <sub>2</sub> )	160 mcg				
MINERALS					
CALCIUM	82 mg	ZINC	0.79 mg	SELENIUM	2 mcg
PHOSPHORUS	44 mg	MANGANESE	5 mcg	SODIUM	25 mg
MAGNESIUM	6 mg	COPPER	95 mcg	POTASSIUM	110 mg
IRON	1.9 mg	IODINE	6 mcg	CHLORIDE	68 mg
INGREDIENTS: NONFAT MILK, LACTOSE, WHEY PROTEIN CONCENTRATE, HIGH OLEIC SAFFLOWER OIL, SOY OIL, COCONUT OIL, GALACTO-OLIGOSACCHARIDES, LESS THAN 2% OF: C, COHNI OIL, M, ALPINA OIL, BETA-CAROTENE, LUTEN, LYCOPENE, POTASSIUM CITRATE, CALCIUM CARBONATE, ASCORBIC ACID, SOY LECTHIN, POTASSIUM CHLORIDE, MAGNESIUM CHLORIDE, FERROUS SULFATE, CHOLINE BITARTRATE, CHOLINE CHLORIDE, ASCORBYL PALMITATE, SALT, TAURINE, m-INOSITOL, ZINC SULFATE, MIXED TOCOPHEROLS, 6-ALPHA-TOCOPHERYL ACETATE, NACNAMIDE, CALCIUM PANTOTHENATE, L-CARNITINE, VITAMIN A PALMITATE, COPPER SULFATE, THIAMINE CHLORIDE HYDROCHLORIDE, RIBOFLAVIN, PYRIDOXINE HYDROCHLORIDE, FOLIC ACID, MANGANESE SULFATE, PHYLLQUINONE, BIOTIN, SODIUM SELENATE, VITAMIN D <sub>3</sub> , CYANOCOBALAMIN, CALCIUM PHOSPHATE, POTASSIUM PHOSPHATE, POTASSIUM HYDROXIDE AND NUCLEOTIDES (ADENOSINE 5'-MONOPHOSPHATE, CYTIDINE 5'-MONOPHOSPHATE, DISODIUM GUANOSINE 5'-MONOPHOSPHATE, DISODIUM URIDINE 5'-MONOPHOSPHATE).					
<b>CONTAINS MILK AND SOY INGREDIENTS.</b>					





# WHAT TO LOOK FOR IN INFANT FORMULA

- Read the label – make sure that the formula you choose has the nutrients important for your baby’s development
  - The American Academy of Pediatrics recommends iron fortified formulas
- Pay attention to allergens
  - Cow’s milk formula = Lactose, dairy/milk allergies
  - Soy formulations
- Do some research and talk to your healthcare provider on what nutrients they feel are important to include
  - For example, carotenoids are not present in *all* infant formulas, but the data suggests that carotenoids are important for infant brain

## KEY TAKEAWAYS

1. Keep a balanced diet during pregnancy to provide balanced nutrients for yourself and baby, while supplementing for DHA, Folic Acid, and other important nutrients that your diet may lack.
2. The brain develops even after birth, so adequate nutrition via breast milk or formula is important for your baby's health.
3. Evaluate the formulas you are thinking of purchasing. Take advantage of what science has learned from breast milk composition when choosing a formula.

QUESTIONS?



## INTERESTED IN LEARNING MORE?

Complete this feedback survey and let us know what you want to learn in future sessions and additional webinars!

[https://illinoisaces.col.qualtrics.com/jfe/form/SV\\_6tZFWZv3E0dZFH](https://illinoisaces.col.qualtrics.com/jfe/form/SV_6tZFWZv3E0dZFH)

## Group Activity – Diet Evaluation

Read through the two diets and think about what each person may be lacking in their diet.

*Person #1*

### **Breakfast:**

2 slices whole-grain toast

1 tbsp plain

2 hard-boiled

### **Lunch:**

3oz chicken

½ cup bro

½ cup black beans

1 tbsp tomato salsa

1 tbsp shredded cheese

### **Snack:**

Handful almonds

1 container yogurt

### **Dinner:**

6oz salmon filet

1 cup quinoa



*Person #2*

### **Breakfast:**

1 container yogurt

1 small apple

2 tbsp peanut butter

### **Lunch:**

2 cups mixed greens

1 tbsp Italian dressing

1 cucumber

1 medium tomato

Prenatal Vitamin

### **Snack:**

½ avocado

1 slice whole-grain toast



1 cup white rice

1 potato

1 cup spinach

1 roasted zucchini

½ roasted onion

1 tbsp dressing