



# The principles of the proper nutrition in childhood

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85% mom believes she has enough knowledge to properly feed the children ...

- The average number of meals: 8 (6 months of age) and 7.7 (12 months of age)
- Max. number of meals: 15-20 / day!
- Additional snacks: 24 % - 75 %
- Juices (not for infants) 25 %

A. Stolarczyk, 2011

- Complementary foods from 4 months of age - 21% of parents
- 50% of parents salt meals for babies
- 20% use skimmed milk

Fein SB, *Pediatrics* 2008

# Main stage of eating development

1-4 m.ž.



5-6 m.ž.



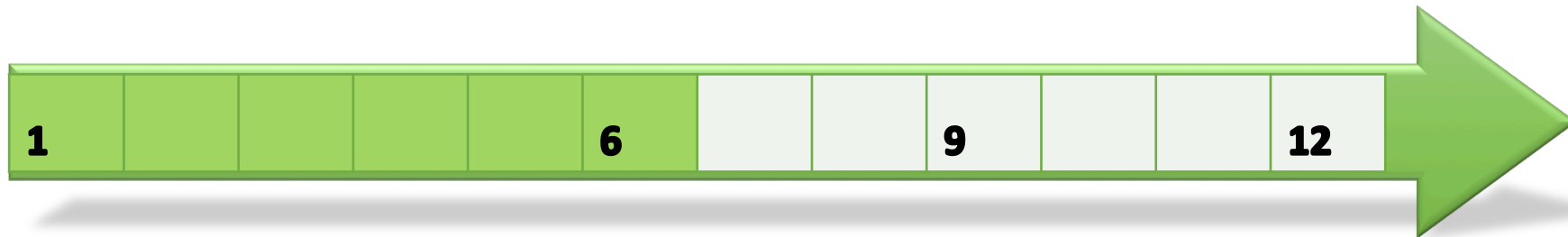
7-12 m.ž.



# Breastfeeding

Exclusive breastfeeding for the first 6 months of age

✓ How long?



**WHO:** exclusive breastfeeding for the first 6 months of age and continued for at least 2 years

**AAP:** exclusive breastfeeding for the first 6 months of age and continued at least until 12 months of age

Age (m.ž.)	No of meals	Amount of portion(m)	Abilities	Nutritional basis	Type and consistency of meals	Meals examples
1	7	110	• Sucking, swallowing	<b>Breastfeeding or modified milk</b>	• liquides	• Breast milk or infant formula
2-4	6	120-140				
5-6	5	150-160	• smooth puree • 4 dairy meals		<ul style="list-style-type: none"> <li>• Cooked mixed vegetables (eg. Carrots) and fruits (eg. Apple, banana), meat, egg or potato puree</li> <li>• Porridge / gruel gluten-free</li> <li>• Cereal products in small quantities no earlier than 5 months of age, no later than 6 months of age.</li> <li>• Water without restrictions</li> <li>• 100% juice, no sugar, 150 ml per day (portion calculated from the amount of intake of fruit)</li> </ul>	
7-8	5	170-180	<ul style="list-style-type: none"> <li>• An increased diversity of ground or chopped food</li> <li>• Products take by hand</li> <li>• 3 meals milk from 7-8. months of age.</li> </ul>		<ul style="list-style-type: none"> <li>• Mixed / finely chopped meat, fish</li> <li>• Mashed cooked vegetables and fruits</li> <li>• Chopped raw vegetables and fruits (eg. Apple, pear, tomato)</li> <li>• Soft pieces of vegetables, fruit, meat fed to the hand</li> <li>• Cereal, bread, yoghurt, cheese, kefir</li> <li>• Whole milk cows after 12 months of age.</li> <li>• Water without restrictions</li> <li>• 100% juice, no sugar, 150 ml per day</li> </ul>	
9-12	4-5	190-220				

# Breast milk

- Colostrum - colostrum is produced for the first 5 days
  - Composition: High-protein antibodies, minerals and growth modulators
  - Milk temporary - until the end of the second week after birth
  - Milk "mature"
- 
- During feeding initially secreted milk is more diluted and sweet, then a higher content of protein and fat

# Breast feeding

- The quantity of milk - 800 ml (500-1200 ml) per day
- Quantity is controlled by prolactin depending on the child's appetite
- The more and more baby suckles the breast, the higher the concentration of prolactin and a greater quantity of milk
- Exclusive breastfeeding and frequent taking baby to the breast is the most effective way to maintain lactation

# Breast feeding

- It should be initiated as early as possible, preferably in the first hour after birth
- After childbirth with C-section no later than 6-8 hours of life
- At the feed efficiency has a decisive influence feeding technique
- Feeding your baby should be "on demand" (both day and night)
- The infant eats usually 8-10 times a day
- Exclusive breastfeeding should be maintained for at least 4-6 months



# Breast feeding advantages

- Better contact the mother-child
- Prevention of infectious diseases, eg. lower incidence of diarrhea
- Prevention of food allergy
- Less frequent occurrence of diseases associated with the development of the immune system, eg. type I diabetes, lymphomas
- Lower incidence of lifestyle diseases eg. hypertension, obesity
- Improved intellectual development of children

# Contraindication to breast feeding

- Maternal infectious disease - HIV
- IEM diseases- maple syrup disease, galactosemia, phenylketonuria
- Tuberculosis
- Drugs used by the mother for example: tetracyclines, ketoconazole, aspirin

# Formula feeding

Modification of cow's milk->

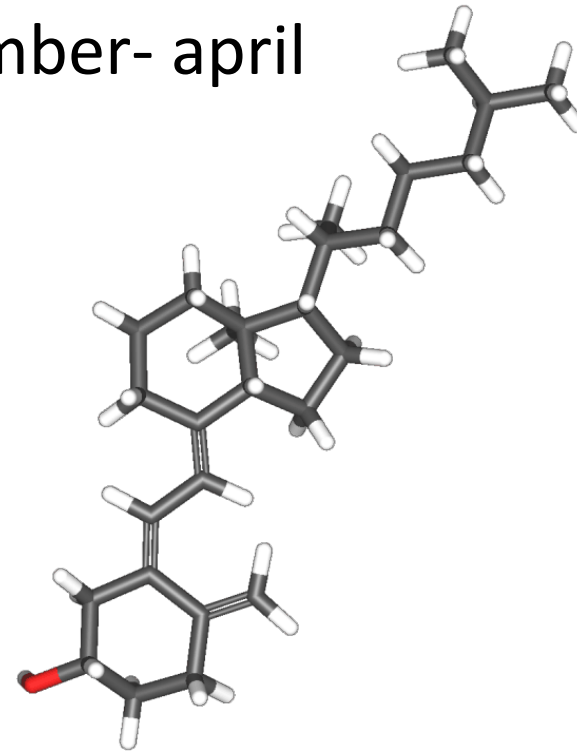
- Reduction of the total protein and change its quality by adding demineralized whey
- Substitution amount and quality of fat by the addition of vegetable fats (unsaturated fatty acids)
- Supplement lactose, vitamins and some trace elements

# Types of formula

- Formula- from 0 to 4 months of age
  - Their composition should be very close to breast milk
  - Bebiko 1, Bebilon 1, Nan 1, Humana 1, Gerber 1
- Formula from 5 to 12 months
  - enriched the taurine, carnitine, iron
  - Bebiko 2, Bebilon 2, Nan 2, Humana 2, Gerber 2
- Formula Junior for children over 1 year of age

# Vitamin supplementation

- Vitamin D- 400 IU/day till 6 months, 400-600 IU/day depending on diet 6-12 months
- > 1 yr Vitamin D 600-1000 IU/ day september- april
- Vitamin K- 2 week- 3 month 25 ug/day



# Preterm infants

- Depending on the clinical condition of the newborn is used enteral or parenteral nutrition, but we can use them both
- Enteral nutrition is introduced after hearing gut motility , premature infants > 1500g usually in the first day of life
- The early introduction of enteral nutrition results in a better stimulation of the development of the digestive tract , better weight gain ( try watering 5 % glucose )
- In most infants enteral nutrition can be started within the first 3 days of life coming to full enteral nutrition at 2-3 weeks of age , even in the smallest premature babies
- NOTE - too intense enteral nutrition can lead to the development of necrotizing enterocolitis

# Preterm infants

- Milk women who were born prematurely is richer in energy, protein and sodium  
The highest calorific value of milk is discharged after 2-3 minutes the feed  
(approximately 82kcal / 100ml )
- Concentration of Ca and P in mature milk is insufficient to balance the demand and losses through the excretory system immature preterm infants
- BMF - Breast Milk Fortifier - 5 kcal 0.35g protein , 1 g of maltodextrin , 30 mg calcium phosphate 20 mg and 2 mg of magnesium
- NOTE - The preparation BMF can not be given to mixtures

# Preterm infants

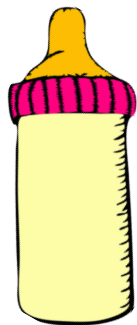
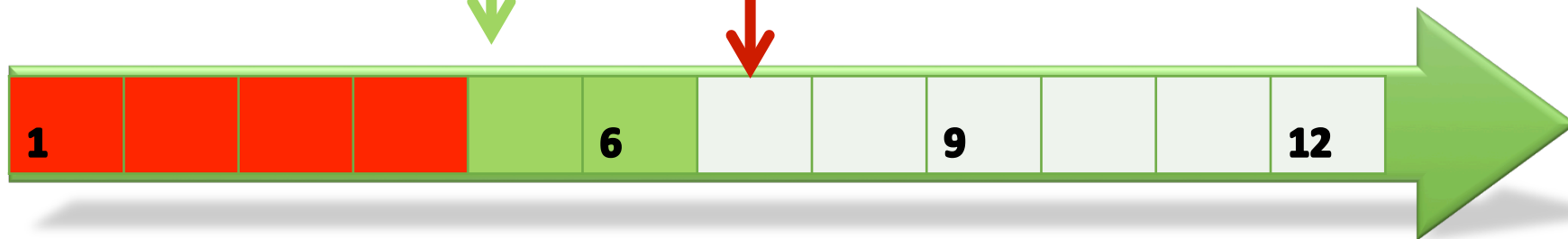
- Formulas: Nenatal , Humana O , Enfamil Premature , Bebilon Nenatal
- These formulas are high in calories- 70-81kcal / 100ml
- They include taurine , MCT , linoleic acid, vitamin , iron, mikroelements
- After reaching 2500g weight it should be changed to infant milk



# Complementary food

Not earlier than 17 week of life

not later than 26 week of life.



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9-12	4-5	190-220				



Does small child can decide what she/ he eats?

YES

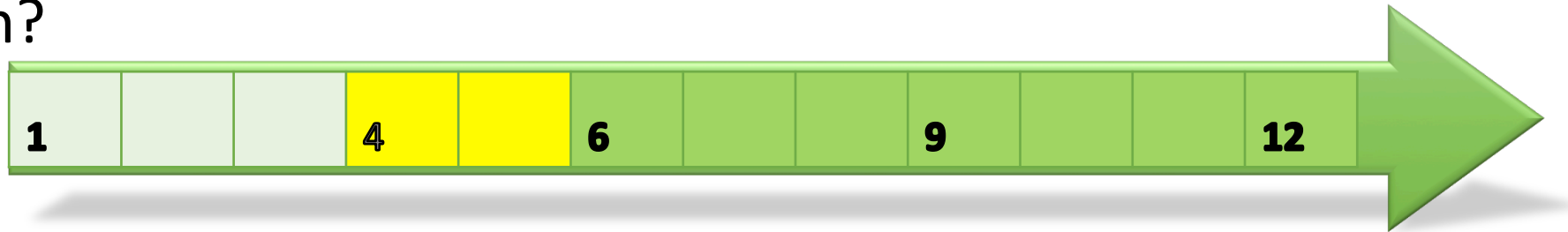
NO

Normally, the child decides-does she/  
he eats and how much she/ he eats.

The parent decides what child eats.

# Complementary food

- When?



- What?

Groats → Vegetables → Fruits

Water, juices



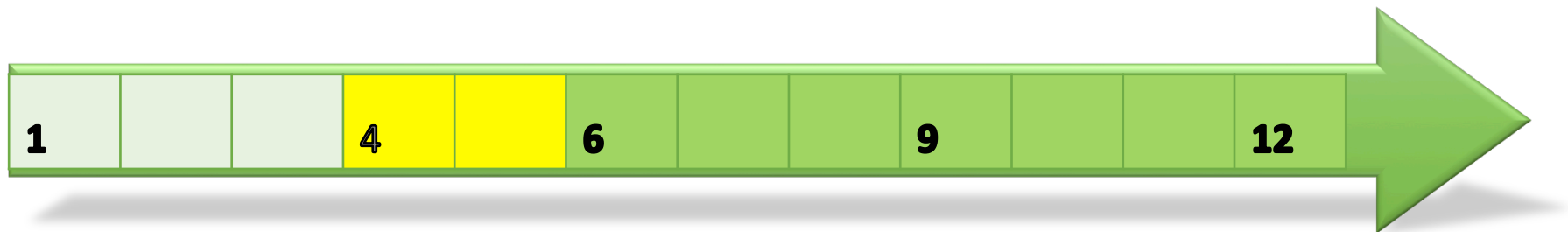
Variety!



Multiple exposure!

# Complementary food

- How?
  - How many meals?
  - What portion of food?
  - What consistencies?
  - How to serve?



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2-4	6	120-140				
5-6	5	150-160	<ul style="list-style-type: none"> <li>Initially- grinding foods by tongue</li> <li>Strong sucking</li> <li>Push the food from the mouth with the tongue (transient response)</li> <li>Opening the mouth when approaching teaspoon</li> </ul>		<ul style="list-style-type: none"> <li>smooth puree</li> <li>4 dairy meals</li> </ul>	<ul style="list-style-type: none"> <li>Cooked mixed vegetables (eg. Carrots) and fruits (eg. Apple, banana), meat, egg or potato puree</li> <li>Porridge / gruel gluten-free</li> <li>Cereal product- gluten, s in small quantities no earlier than 5 months of age., No later than 6 months of age.</li> <li>Water without restrictions</li> <li>100% juice, no sugar, 150 ml per day (portion calculated from the amount of intake of fruit)</li> </ul>
7-8	5	170-180	<ul style="list-style-type: none"> <li>Taking with lips food from a spoon</li> </ul>		<ul style="list-style-type: none"> <li>An increased diversity of ground or chopped food</li> <li>Products take by hand</li> <li>3 meals milk from 7-8. months of age.</li> </ul>	<ul style="list-style-type: none"> <li>Mixed / finely chopped meat, fish</li> <li>Mashed cooked vegetables and fruits</li> <li>Chopped raw vegetables and fruits (eg. Apple, pear, tomato)</li> <li>Soft pieces of vegetables, fruit, meat fed to the hand</li> <li>Cereal, bread, yoghurt, cheese, kefir</li> <li>Whole milk cows after 12 months of age.</li> <li>Water without restrictions</li> <li>100% juice, no sugar, 150 ml per day</li> </ul>
9-12	4-5	190-220	<ul style="list-style-type: none"> <li>The development of skills and coordination to maintain independent feeding</li> </ul>			

BLW = Baby Led Weaning



# The Caroline Walker Trust: *Eating well: the first year of life*

**FIRST FINGER FOODS** These finger foods can be introduced from the age of 6 months.



Banana



Avocado



Cooked carrot



Soft-cooked potato



Cooked red peppers



Cooked yellow peppers

**FINGER FOODS** These finger foods can be introduced from the age of about 7 months.



Bread squares



Pasta shapes



Potato



Yam



Egg



Butter beans



# Children 1-3 years

- Change of growth rate - at 12 months of age the infant usually triples its birth weight, and 2-3-year-old year gaining weight 2-3 kg
- Independent way of eating
- Variety of meals
- Selection of appropriate foods
- Excessive fragmentation products can inhibit the psychomotor development

# Children 1-3 years

1. Variety of ingredients
2. To 2 years old - not low fat and cholesterol diet- the development of CNS
3. Driving the appetite and physical activity of the child prevents the overfeeding or malnutrition
4. 3-5 meals a day and avoid snacking
5. Do not grind excessively products
6. Vegetarian diet and other non-conventional diets are inappropriate for the child
7. The best source of simple sugars are fruits and vegetables

# Preschool age

- 4-5 meals a day - 3 meals basic, second breakfast and afternoon tea meal
- Diet: dairy products, lean meats, fish and poultry, varied species of bread, flour products, cereal, pasta, fruit, vegetables
- Number of eggs: 3-4 week
- Restrict foods rich in saturated fats and cholesterol
- Control the intake of sweets, drinking fizzy drinks and snacking between meals

# School age

- Principles of rational nutrition
- Variety - a wide range of food products
- Moderation - not overfeeding
- Avoiding - excess salt and sugar
- Regulate - fixed date and the number of meals per day

# Food allergy

- 8-10% of the population are hypersensitive to various foods
- 2.2-2.8% of children up to 4 years of age are allergic to cow's milk protein
- Cow's milk protein 20 different factions of potential allergenic
- $\beta$ -lactoglobulin
- Symptoms of atopic dermatitis, urticaria, angioedema, vomiting, diarrhea, asthma, chronic rhinitis, cough, otitis, emotional disorders

# Food allergy

- Elimination of the food or the ingredient that causing problems
- Elimination diet must be balanced
- Breastfeeding - mother's Diet
- Artificial nutrition:
- Hydrolysates of cows' milk protein ( casein and whey proteins)
- Free amino acids formula

# Food allergy treatment

- Casein hydrolysates - Nutramigen
- Whey hydrolysates - Bebilon Pepti, Bebilon Pepti MCT
- The higher the degree of hydrolysis, the more favorable are the characteristics of a drug, but worsens the flavor and increasing osmolality. Also increase production costs.
- Amino acid preparations are designed for children with allergies which are not treatable by protein hydrolysates -Neocate, Bebilon-Amino
- L-amino acids have a sour taste, they are poorly tolerated by infants and are the most expensive

# Prevention of the food allergy

- Breastfeeding for at least 6 months of age
- Elimination diet in the mother
- Mixtures HA hypoallergenic (partially hydrolysed): NAN HA, Aptamil HA, HA Enfamil



# References and literature

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