



Infant Formulas

DR. SALMA BURAYZAT

ASSISTANT PROFESSOR, HASHEMITE UNIVERSITY

PEDIADTRIC GASTROENTEROLOGY, HEPATOLOGY, AND NUTRITION

1st and 2nd age
formula
Growth formulas

True or false

- A. 2nd age formula are less rich in proteins, calcium, and iron than 1st age formulas.
- B. 2nd age formulas are less rich in lipids than 1st age formula.
- C. 2nd age formula must replace 1st age formula at 5-6 months of age.
- D. Growing formulas are less rich in proteins, calcium, and iron than 2nd age formula.
- E. Growing formulas are are double the price of cow's milk.

True or false

- A. 2nd age formula are less rich in proteins, calcium, and iron than 1st age formulas.
- B. 2nd age formulas are less rich in lipids than 1st age formula.
- C. 2nd age formula must replace 1st age formula at 5-6 months of age.
- D. Growing formulas are less rich in proteins, calcium, and iron than 2nd age formula.
- E. Growing formulas are are double the price of cow's milk.

Comparative Comparison

For 100 ml	1st age formula	2 nd age formula	Growth formula
Proteins (g)	1.4	1.6	1.8
Lipids (g)	3.4	3.0	3.0
Linolique acid (mg)	600	567	522
Linolinique acid (mg)	60	57	68
Carbohydrates (g)	7.5	8.1	8.0
Sodium (mg)	19	25	30
Calcium (mg)	51	68	82
Energy (kcal)	67	66	66
Iron (mg)	0.7	1.0	1.2
Vit E (mg)	0.9	1.1	1.0
Vit C (mg)	9.5	9.5	9.0
Vit B9 (µg)	10	11	16.5
Vit B12 (µg)	0.2	0.2	0.25

Age of introduction

- ▶ 2nd age formula
 - ▶ When one or more meals are diversified
 - ▶ It does not depend on age

- ▶ Growth formula
 - ▶ When child stops wanting 2nd age formula, around one year of age.

Cost

- ▶ 1st age.....3 JD/L
- ▶ 2nd age4 JD/L
- ▶ Growth formula.....0.6 JD/L
- ▶ Cow's milk.....1.2 JD/L

- ▶ Breast milk
 - ▶ Liquid.....62.5 EURO/L
 - ▶ Powder.....120 EURO/L

Growth formulas; do they have a nutritional value or just a commercial product?

For 100 ml	Growth Formula	Cow's milk
Protein (g)	1.8	3.2
Linolique Acid (mg)	522	70
Linolinique Acid (mg)	6820	20
Iron (mg)	1.2	0.05
Vit D (IU)	50	1.2

Protein is less, less load on kidney + iron & vit-d multiples of cow milk content

Diet modification to compensate for nutritional deficiencies caused by substituting growth formula for cow's formula

Growth formula is the most economic way to give absorbable iron to children

For a child who consumes 250 ml/d of milk, you should add :

- ▶ 1 teaspoon of soja oil or 2 teaspoon of colza oil (EFA).
- ▶ Insure supplementation of 150 IU/D of Vit D
- ▶ Replace daily intake of meat by 100 g of liver (1 time/week) or 100 g of meat per day (Iron)

If cow milk then add these

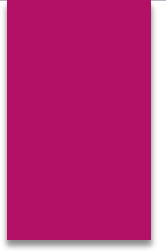
True or false

- A. Formulas that are thickened with starch start their action from the moment of preparation in contrast to formulas thickened with carob.
- B. If lactose free formula was used after acute diarrhea, the reintroduction of normal formula must be progressive over 3-5 days
- C. Most of lactose free formula are partially hydrolysed.
- D. Soy protein formulas are tolerated by 2/3 of patients with IgE mediated Cow's protein milk allergy.
- E. Most of Soy protein formulas do not contain phytoestrogens.

True or false

- A. Formulas that are thickened with starch start their action from the moment of preparation in contrast to formulas thickened with carob.
- B. If lactose free formula was used after acute diarrhea, the reintroduction of normal formula must be progressive over 3-5 days
- C. Most of lactose free formula are partially hydrolysed.
- D. Soy protein formulas are tolerated by 2/3 of patients with IgE mediated Cow's protein milk allergy.
- E. Most of Soy protein formulas do not contain phytoestrogens.

Thickened Formulas



Thickened Formula

Starch

- ▶ Addition of rice, corn or potatoe starch.
- ▶ Thickening start when reaching stomach acidity
- ▶ Indication: GER

Extra Indication: failure to thrive

Carob

- ▶ Thickening starts from the moment of preparation
- ▶ Indication:
 - ▶ GER
 - ▶ Bronchiolitis
 - ▶ Probrlems in swallowing

Thickened Formula

- ▶ Has a positive effect on GER.
- ▶ Does not have any effect on acidity index.
- ▶ May have undesirable side effects such as diarrhea especially with formula based on carob.

Lactose Free Formula

Lactose free formula

Characteristics:

- ▶ Lactose is replaced by dextrin maltose
- ▶ Formula is composed of whole milk protein
- ▶ Similar compositions to other infantile formulas

Indication for lactose free formula

From the beginning

- ▶ Severe diarrhea
- ▶ Infant between the age of 3-6 months with diarrhea
- ▶ Premature

Lactose intolerance most common cause post gastroenteritis especially (<3 month)

Second attempt

- ▶ Persistent diarrhea for 5 days

For how long

- ▶ Around 8 days; prescribe one or two cans
- ▶ Return to original formula abruptly no transition

Soy protein
based formula

Soy protein based formula

charecteristics

- ▶ Prepared entirely from soy protein
- ▶ Lactose free (dextrin maltose and starch)
- ▶ Abide by the regulations controlling infant formulas

Indications

- ▶ Lactose free formula
- ▶ Child > 6 months with CPMA(cow milk protein allergy), only in the IgE mediated type and in children who refuse the hydrolesate and after test of cross reactivity
Soy contain plant estrogen so not given for males <6 months
- ▶ Family who are vegans

- ▶ 47% associated allergy with non IgE mediated CMPA
- ▶ 14 % associated allergy with IgE mediated CMPA

True or false

- A. The majority of protein hydrolysates do not contain lactose
- B. Diets poor in cow's protein carry a risk of calcium deficiency when diversification is complete
- C. In nurseries where exclusive breast feeding is planned, the first bottle if indicated should be a protein hydrolysate
- D. Certain hypoallergen formulas have shown their efficacy in allergy prevention in neonates with positive family history of atopy
- E. The completely hydrolysed formulas have a higher efficacy than hypoallergen formulas in the prevention of allergies in neonates with positive family history of atopy.

True or false

- A. The majority of protein hydrolysates do not contain lactose
- B. Diets poor in cow's protein carry a risk of calcium deficiency when diversification is complete
- C. In nurseries where exclusive breast feeding is planned, the first bottle if indicated should be a protein hydrolysate
- D. Certain hypoallergen formulas have shown their efficacy in allergy prevention in neonates with positive family history of atopy
- E. The completely hydrolysed formulas have a higher efficacy to hypoallergen formulas in the prevention of allergies in neonates with positive family history of atopy.

Extensively Hydrolysed infant formula

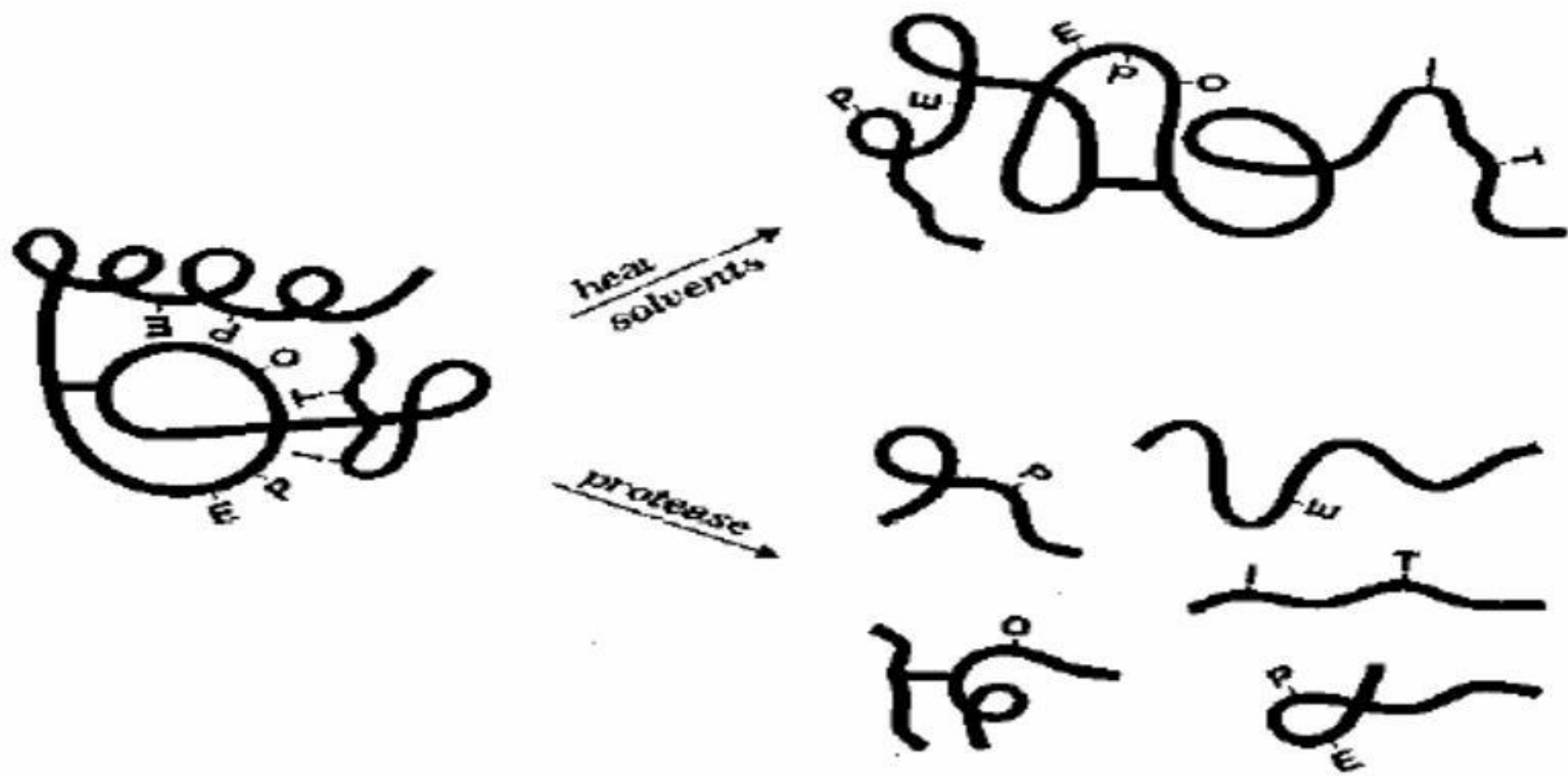
Characteristics

- ▶ Extensively hydrolyzed formula
- ▶ Traces of lactose
- ▶ Lipides are of the MCFA
- ▶ Minerals, vitamins and energy are similar to other infantile formula
- ▶ Particular smell and taste

Indications

- ▶ CPMA
- ▶ Re-alimentation of neonates <3 months with acute diarrhea
- ▶ Certain severe gastrointestinal pathologies

Reduction de l'allergénicité



Extensively hydrolysed infant formula

- ▶ Extensively hydrolyzed formula should not be prescribed for long period of times without confirmation of CMPA
- ▶ It is legitimate to prescribe EHF when CMPA is suspected
- ▶ It is indispensable to confirm the diagnosis of CMPA by reintroduction a few weeks later
- ▶ Because a regimen without CMP is:
 - ▶ Very hard to follow after diversification
 - ▶ Very expensive
 - ▶ Has the chance of calcium deficiency

Hypo-allergen formula

Hypo-allergen formula

- ▶ The persistence of antigenic potential allows for build up of tolerance
- ▶ Reduction in antigenic potential allows for progressive stimulation.
- ▶ So
 - ▶ HA formulas have a place in the prevention of allergy in children with family history of atopy
 - ▶ It is not useful to prescribe HA formula after diversification.
 - ▶ In the absence of knowledge about family history of atopy, it is feasible to start HA formula

Free amino Acid
formula

Free amino acid formula

- ▶ Free amino acids
 - ▶ Lactose free
 - ▶ Long chain triglycerides
-
- ▶ Neocate, Neutramigen AA

Indication of free amino acid formula

- ▶ True allergy to extensively hydrolysed formula
- ▶ Severe GI pathologies
- ▶ Attention for abuse prescription:
 - ▶ In case of suspicion of CPMA
 - ▶ Benign GI pathology

When to give What

- ▶ GER → Thickened formula
- ▶ Sever acute diarrhea → lactose free formula
- ▶ Family history of atopy → HA formula
- ▶ CPMA → Extensively hydrolysed formula
- ▶ Allergy to EH formula → Free amino acids preparation

Thank you