Divezzamento: un pasto problematico

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"...mangerà
latte cagliato e miele"

Isaia 7:15

Journal of Pediatric Gastroenterology and Nutrition
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North American Society for Pediatric Gastroenterology, Hepatology, and Nutrition

Medical Position Paper

Complementary Feeding: A Commentary by the ESPGHAN Committee on Nutrition

ESPGHAN Committee on Nutrition: *Carlo Agostoni, †Tamas Decsi, ‡[3]Mary Fewtrell, §Olivier Goulet, ¶Sanja Kolacek, ||[1]Berthold Koletzko, **[3]Kim Fleischer Michaelsen, ††Luis Moreno, ‡‡John Puntis, §§Jacques Rigo, ¶¶Raanan Shamir, ||||[2]Hania Szajewska, ***Dominique Turck, and †††Johannes van Goudoever

Most current guidelines on complementary feeding are not evidence based.

Dietary schedules for the progressive introduction of solids during the complementary feeding period in most countries originate from cultural factors and available foods.

Conclusions and Recommendations

WHO

(World Health Organization)

"Any nutrient-containing foods or liquids other than breast milk given to young children during the period of complementary feeding are defined as complementary foods"

ESPGHAN

(European Society for Paediatric Gastroenterology, Hepatology and Nutrition)

The term *complementary feeding* should embrace all solid foods and liquids other than breast milk or infant formula and follow-on formula.

ESPGHAN

European Society for Paediatric Gastroenterology, Hepatology and Nutrition

ESPACI

European Society for Paediatric Allergology and Clinical Immunology

AAP

American Academy of Pediatrics

ASCIA

ascia ustralasian Society of Clinical Immunology and Allergy

Esordio

Società Scientifiche	ESPACI/ESPGHAN (2008)	AAP (2008)	ASCIA (2005)
Epoca di esordio	26ª settimana	4 mesi	4-6 mesi

Esordio

The Australasian Society of Clinical Immunology and Allergy position statement: summary of allergy prevention in children.

Prescott SL Med J Aust 2005; 182: 464-7

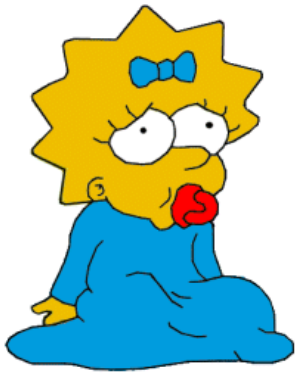
"Complementary foods (including normal cow's milk formulas) should be delayed until a child is aged at least 4–6 months,

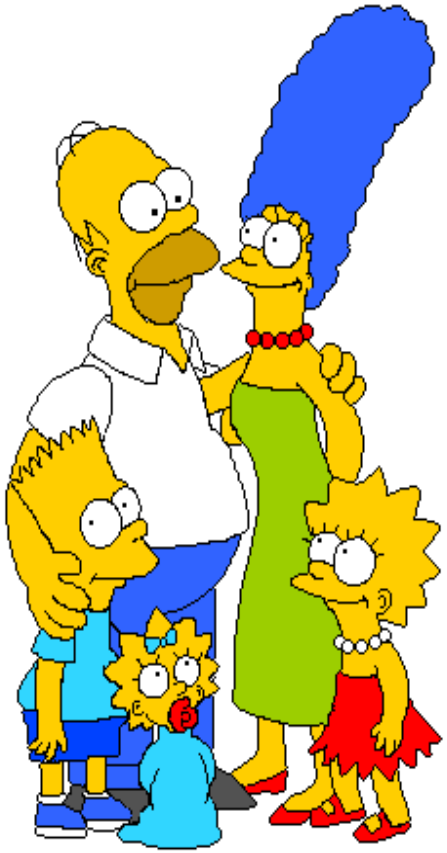
but a preventive effect from this measure has only been demonstrated in high-risk infants."

Lattanti ad alto rischio

...ma chi è il lattante

"ad alto rischio di sviluppare allergia"?





- Allergia alimentare
- Dermatite atopica
- Rino-congiuntivite allergica
- Asma

Lattanti ad alto rischio

se allergici…

ESPACI/ESPGHAN (1999)	✓ 1 genitore ✓ 1 fratello
AAP (2008)	
ASCIA (2005)	✓ 2 genitori ✓ 1 genitore e 1 fratello

Il rischio allergico risulta correlato

- ✓ alla *precocità di introduzione* dell'alimento complementare

- ✓ al tipo di alimento…

…ma sarà vero?

Divezzamento e allergia

The introduction of solids in relation to asthma and eczema.

Zutavern A et al. Arch Dis Child 2004; 89: 303-8

Studio prospettico di coorte eseguito su 642 bambini dalla nascita a 5 anni e mezzo

"There was no evidence for a protective effect of late introduction of solids for the development of preschool wheezing, transient wheezing, atopy, or eczema. Results do not support the recommendations given by present feeding guidelines stating that a delayed introduction of solids is protective against the development of asthma and allergy."

Clinical and Experimental Allergy, **37**, 671–679 2007

The association between infant feeding practices and subsequent atopy among children with a family history of asthma

S. Mihrshahi*, R. Ampon†, K. Webb‡, C. Almqvist†§¶, A. S. Kemp*||, D. Hector‡ and G. B. Marks† for the CAPS Team

516 bambini valutati a 5 anni

"Longer duration of breastfeeding and later introduction of solid foods did not prevent the onset of asthma, eczema or atopy by age 5 years."

Solid food introduction in relation to eczema: results from a four-year prospective birth cohort study.

GINI Group.

Filipiak B et al J Pediatr 2007; 151: 352-8

The evidence from this study supports

- ✓ neither a delayed introduction of solids beyond the fourth month
- ✓ nor a delayed introduction of the most potentially allergenic solids beyond the sixth month of life for the prevention of eczema.

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Conclusions and Recommendations

Avoidance or delayed introduction of potentially allergenic foods, such as fish and eggs, has not been convincingly shown to reduce allergies, either in infants considered at risk for the development of allergy or in those not considered to be at risk.

Divezzamento e allergia

PEDIATRICS
OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

Timing of Solid Food Introduction in Relation to Eczema, Asthma, Allergic Rhinitis, and Food and Inhalant Sensitization at the Age of 6 Years: Results From the Prospective Birth Cohort Study LISA

Anne Zutavern, Inken Brockow, Beate Schaaf, Andrea von Berg, Ulrike Diez, Michael Borte, Ursula Kraemer, Olf Herbarth, Heidrun Behrendt, H-Erich Wichmann, Joachim Heinrich and LISA Study Group

Pediatrics 2008;121;e44-e52;

prospective, cohort study of 2612 infants without a risk of developing atopic disease

CONCLUSIONS

We found no evidence to recommend a delayed introduction of solids beyond 4 or 6 months for the prevention of asthma, allergic rhinitis, and food or inhalant sensitization at the age of 6 years. For eczema, the situation is still unclear. Positive associations between the timing of introduction of solids and food sensitization have to be considered with caution.

PEDIATRICS
OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

Hypoallergenic Infant Formulas
Committee on Nutrition
Pediatrics 2000;106;346-349

lattanti ad alto rischio

1 anno

2 anni

3 anni

American Academy of Pediatrics
DEDICATED TO THE HEALTH OF ALL CHILDREN™

PEDIATRICS
OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

Effects of Early Nutritional Interventions on the Development of Atopic Disease in Infants and Children: The Role of Maternal Dietary Restriction, Breastfeeding, Timing of Introduction of Complementary Foods, and Hydrolyzed Formulas

Frank R. Greer, Scott H. Sicherer, A. Wesley Burks and and the Committee on Nutrition and Section on Allergy and Immunology

Pediatrics 2008;121;183-191

"There is no current convincing evidence that delaying introduction of solid foods has a significant protective effect on the developmentof atopic disease regardless of whether infants are fed cow milk protein formula or human milk.

This includes delaying the introduction of foods that are considered to be highly allergic, such as fish, eggs, and foods containing peanut protein."

Divezzamento e allergia

PEDIATRICS
OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS
2007

Timing of Initial Exposure to Cereal Grains and the Risk of Wheat Allergy

Jill A. Poole, Kathy Barriga, Donald Y.M. Leung, Michelle Hoffman, George S. Eisenbarth, Marian Rewers and Jill M. Norris

Pediatrics 2006;117;2175-2182

CONCLUSIONS. Delaying initial exposure to cereal grains until after 6 months may increase the risk of developing wheat allergy. These results do not support delaying introduction of cereal grains for the protection of food allergy.

Clinical and Experimental Allergy, **37**, 671–679 2007

The association between infant feeding practices and subsequent atopy among children with a family history of asthma

S. Mihrshahi*, R. Ampon†, K. Webb‡, C. Almqvist†§¶, A. S. Kemp*||, D. Hector‡ and G. B. Marks† for the CAPS Team

516 children evaluated at age 5 years.

Avoidance beyond 6 months has been associated with increased risk of allergic disease (food allergy, eczema, asthma).

Early introduction of fish decreases the risk of eczema in infants.

Alm Bet al. Arch Dis Child. 2008

8176 famiglie

The prospective, longitudinal study of a cohort of infants born in Sweden showed that, at 1 year of age, 20.9% of the infants had had or had eczema. The median age at onset was 4 months. Multivariable analysis showed that familial eczema, particularly in siblings, was an independent risk factor).

No change in risk was observed with the age at which milk or eggs were introduced, or having a cat or dog at home.

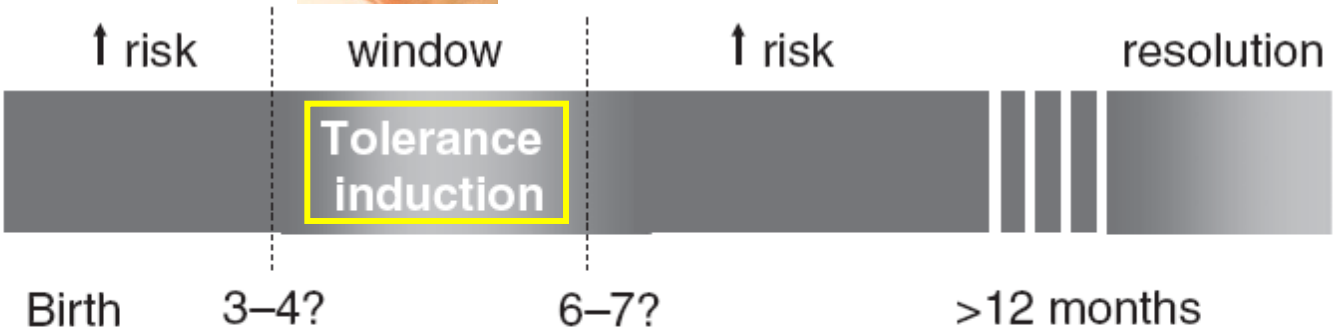
The study also showed the beneficial effects of introducing fish before 9 months of age (OR: 0.76) and having a bird at home (OR: 0.35).

Pediatr Allergy Immunol 2008: 19: 375–380

Susan L. Prescott

The importance of early complementary feeding in the development of oral tolerance: Concerns and controversies

Exposure to specific foods in the 4-6 months age range may reduce the risk of food allergies and autoimmunity compared with children first exposed either before or after this "window".



Pediatr Allergy Immunol 2008: 19: 375–380

Susan L. Prescott

Children initially exposed to cereals between ages 0 and 3 months and those who were exposed after 6 months had increased risk of islet cell autoantibodies than those who were exposed between 4 and 6 months.

Similarly, delayed exposure to gluten (after 6 months) was associated with increased risk of coeliac disease autoimmunity and biopsy-diagnosed coeliac disease compared with those exposed at 4–6 months.

Exposure prior to 4 months was also associated with increased risk of coeliac disease autoimmunity and biopsy-diagnosed coeliac disease.

Conclusions and Recommendations

It is prudent

- ✓ to avoid both early (<4 months) and late (>7 months) introduction of gluten,
- ✓ to introduce gluten gradually while the infant is still breast-fed

because this may reduce the risk of

celiac disease, type 1 diabetes mellitus, and wheat allergy.

Conclusions and Recommendations

Infants and young children receiving a vegetarian diet should receive a sufficient amount (~500 mL) of milk (breast milk or formula) and dairy products.

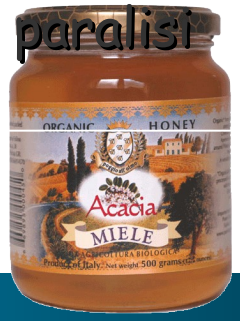
Infants and young children should not receive a vegan diet.

Il miele è il principale alimento responsabile di una grave tossinfezione alimentare, nota come botulismo infantile. Tale patologia, sostenuta da diverse specie di Clostridium spp., interessa solo i lattanti.

Diversamente dal botulismo alimentare (forma classica), dovuto all'assunzione della tossina preformata con l'alimento, nel botulismo infantile le spore ingerite trovano condizioni ottimali di sviluppo a livello del colon del lattante, dove si trasformano in forma vegetativa e in fase di moltiplicazione producono la tossina.

Dall' intestino la neurotossina botulinica raggiunge, per via ematica, le placche neuromuscolari, impedendo la liberazione dell'acetilcolina.

La sintomatologia classica è caratterizzata da costipazione (sintomo prodromico, che tende a precedere di alcuni giorni tutti gli altri), difficoltà alla suzione, pianto debole, letargia, comparsa di paralisi flaccida discendente simmetrica.



Conclusions and Recommendations

Whereas different foods may contain spores of *Clostridium botulinum*, <u>the consumption of honey has been repeatedly associated with infant botulism</u>.

Therefore, honey should not be introduced before 12 months of age unless the heat-resistant spores have been inactivated by adequate high-pressure and high-temperature treatment, as used in industry.

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Infant nutrition research has historically focused on the prevention of malnutrition and deficiency states.

With increasing economic prosperity, these concerns have receded.

The emphasis has shifted toward achieving a balanced protein and energy intake and preventing the risk of long-term disease.

Conferenza Europea sull'Obesità
Copenaghen, 2002

SOVRAPPESO nei bambini	
Italia, Grecia	36%
Spagna	27%
Svizzera	24%
Inghilterra	20%
Francia	19%
Germania	14%
Polonia, Russia	9%

Influence of macronutrients on adiposity development: a follow up study of nutrition and growth from 10 months to 8 years of age.

Rolland-Cachera MF et al Int J Obes Relat Metab Disord 1995; 19: 573-8

Nei primi 2-3 anni di vita una alimentazione iperproteica, oltre a causare un aumento di volume delle cellule adipose (*ipertrofia*), determina anche un aumento del loro numero (*iperplasia*).



L'iperplasia cellulare comporta in età adulta

maggiore predisposizione all'obesità

difficoltà a calare di peso

(impossibilità di ridurre il numero degli adipociti)

Ipotesi Proteine-adiposita'

High intakes of milk, but not meat, increase s-insulin and insulin resistance in 8-year-old boys.

Hoppe C et al — Eur J Clin Nutr. 2005; 59: 393-8

" Our results indicate that a short-term high milk, but not meat, intake increased insulin secretion and resistance.."

Ipotesi Proteine-adiposita'

Protein intake during the period of complementary feeding and early childhood and the association with body mass index and percentage body fat at 7 y of age.

Günther AL et al Am J Clin Nutr. 2007; 85: 1626-33

"High protein intakes during the period of complementary feeding and the transition to the family diet are associated with an unfavorable body composition at the age of 7 years."

Early protein intake and later obesity risk: which protein sources at which time points throughout infancy and childhood are important for body mass index and body fat percentage at 7 y of age?

Günther AL et al Am J Clin Nutr. 2007; 86: 1765-72

A higher animal, especially dairy, protein intake at 12 months may be associated with an unfavorable body composition at 7 years.

La recente revisione dell'IDECG (*International Dietary Energy Consultative Group*) ha proposto per il primo anno di vita fabbisogni e apporti proteici di sicurezza più bassi di circa il 10-30% (a seconda delle fasce di età) rispetto alle stime di riferimento della FAO/WHO/UNU (Food and Agricolture Organization/World Health Organization/United Nations University, 1985).

Tali raccomandazioni esprimono valori proteici inferiori anche a quelli indicati nel 1996 dai nostri LARN

(*Livelli giornalieri raccomandati di assunzione di energia e nutrienti per la popolazione italiana*)

Proteine

Età:

6-12 mesi

Fabbisogno Proteico:

~ 0.8 g/kg/die

Apporto Proteico di Sicurezza:

~ 1.0 g/kg/die

How much protein is safe?

Agostoni C et al Int J Obes 2005; 9 Suppl 2: S8-13

L'intake proteico giornaliero ≥ 4 g/kg (≥ 16% dell' intake di energia totale) tra i 6 ed i 24 mesi di vita sarebbe associato al successivo sviluppo di obesità.

Adottando diete con livelli proteici <15% tale associazione non è stata osservata.

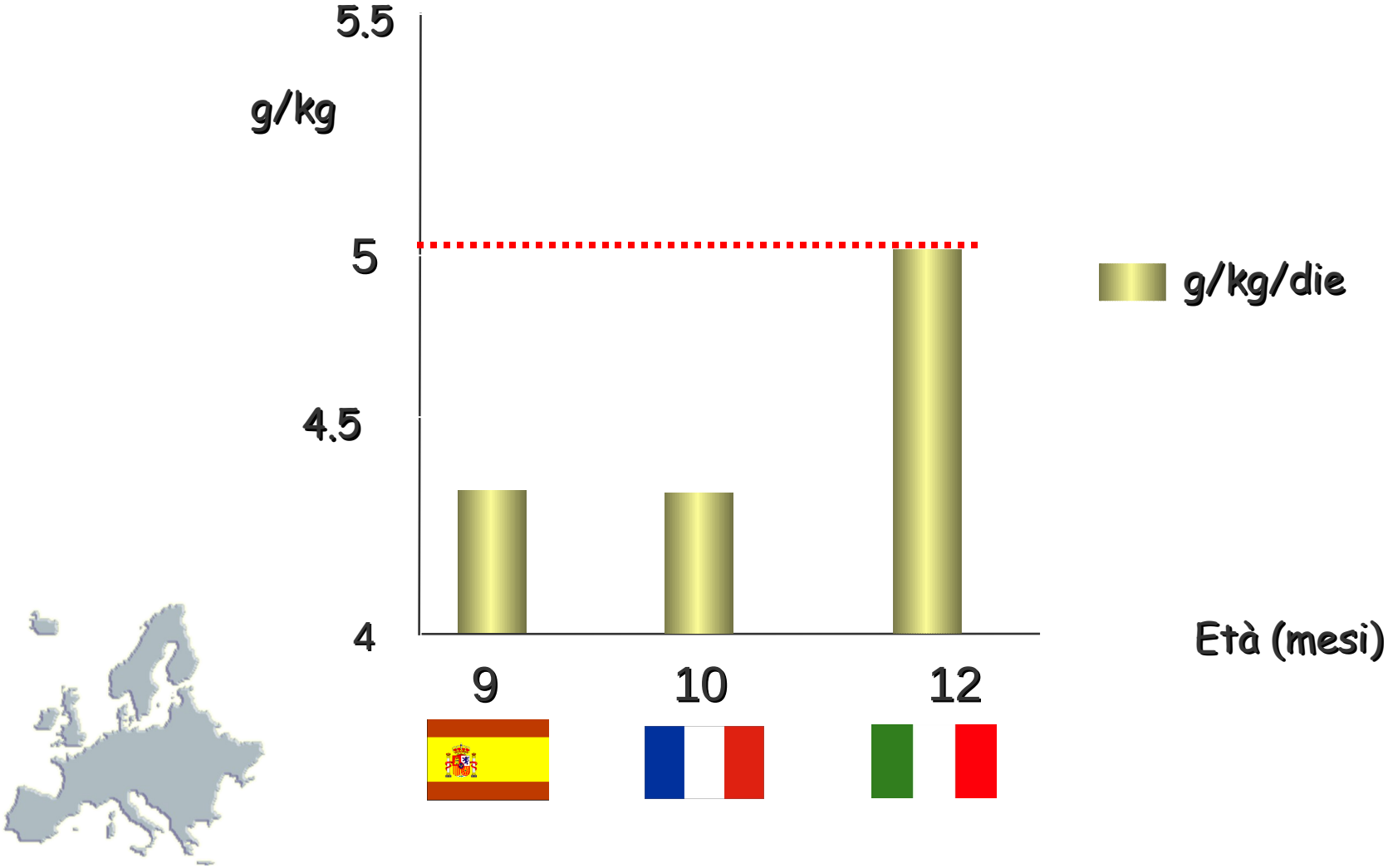
Increasing prevalence of obesity among 18-year-old males in Sweden: evidence for early determinants.

Rolland-Cachera MF et al Acta Paediatr 1999; 88: 365-7

6-12 mesi	1 g/kg/die

Paese	Età (mesi)	Proteine (g/kg/die)
Italia	12	5.1
Spagna	9	4.4
Francia	10	4.3
Belgio	12-36	3.8
Danimarca	12	3.3

Intake proteico



Rolland-Cachera MF et al Acta Paediatr 1999; 88: 365-7

Alimenti di proseguimento

DIRETTIVA 2006/141/CE DELLA COMMISSIONE

del 22 dicembre 2006

riguardante gli alimenti per lattanti e gli alimenti di proseguimento e recante abrogazione della direttiva 1999/21/CE

2.1. Alimenti di proseguimento a base di proteine di latte vaccino

Minimo	Massimo
0,45 g/100 kJ	0,8 g/100 kJ
(1,8 g/100 kcal)	(3,5 g/100 kcal)

Alimento di PROSEGUIMENTO	Contenuto PROTEICO (per 100 ml di latte ricostituito)
NIDINA 2 PE	1.3
NIDINA Active 2	1.3
NIDINA Confort 2	1.3
FORMULAT 2	1.35
MELLIN 2	1.4
MILTINA 2	1.4
APTAMIL 2	1.5
CRESCENDO 2	1.5
HUMANA 2	1.5
NIPIOL 2	1.5

Alimento di PROSEGUIMENTO	Contenuto PROTEICO (per 100 ml di latte ricostituito)
PELARGON 2	1.5
PLASMON 2	1.5
PLASMON Premium 2	1.5
BEBILAC 2	1.55
MELLIN Progress 2	1.6
NEOLATTE 2	1.6
BLEMIL Plus Forte 2	1.7
NUTRIBEN Proseguimento	1.7
ENFAMIL Premium 2	1.8
LENILAC 2	1.8

7 mesi

Apporto Proteico di Sicurezza:
~ 1.0 g/kg/die

Pranzo	
Cereali	20g
Carote (nel brodo vegetale)	10g
Zucchine (nel brodo vegetale)	10g
Cipolle (nel brodo vegetale)	10g
Olio extravergine di oliva	5g
Liofilizzato di carne	5g
Omogeneizzato di frutta	40g

Cena	
Cereali	20g
Carote (nel brodo vegetale)	10g
Zucchine (nel brodo vegetale)	10g
Cipolle (nel brodo vegetale)	10g
Olio extravergine di oliva	5g
Formaggio Grana	5g
Omogeneizzato di mela	40g

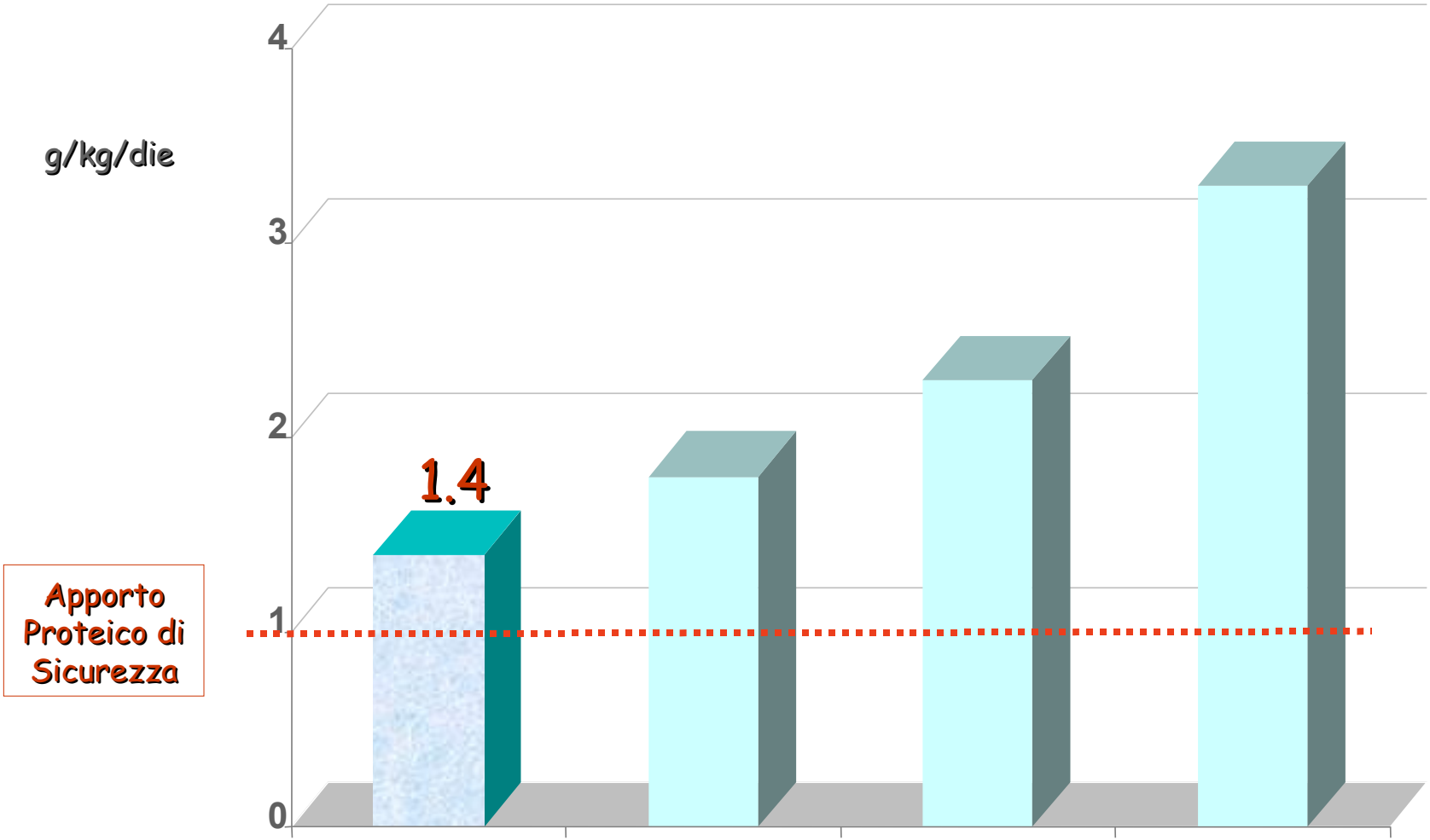
+

Latte materno

+

250 ml

250 ml

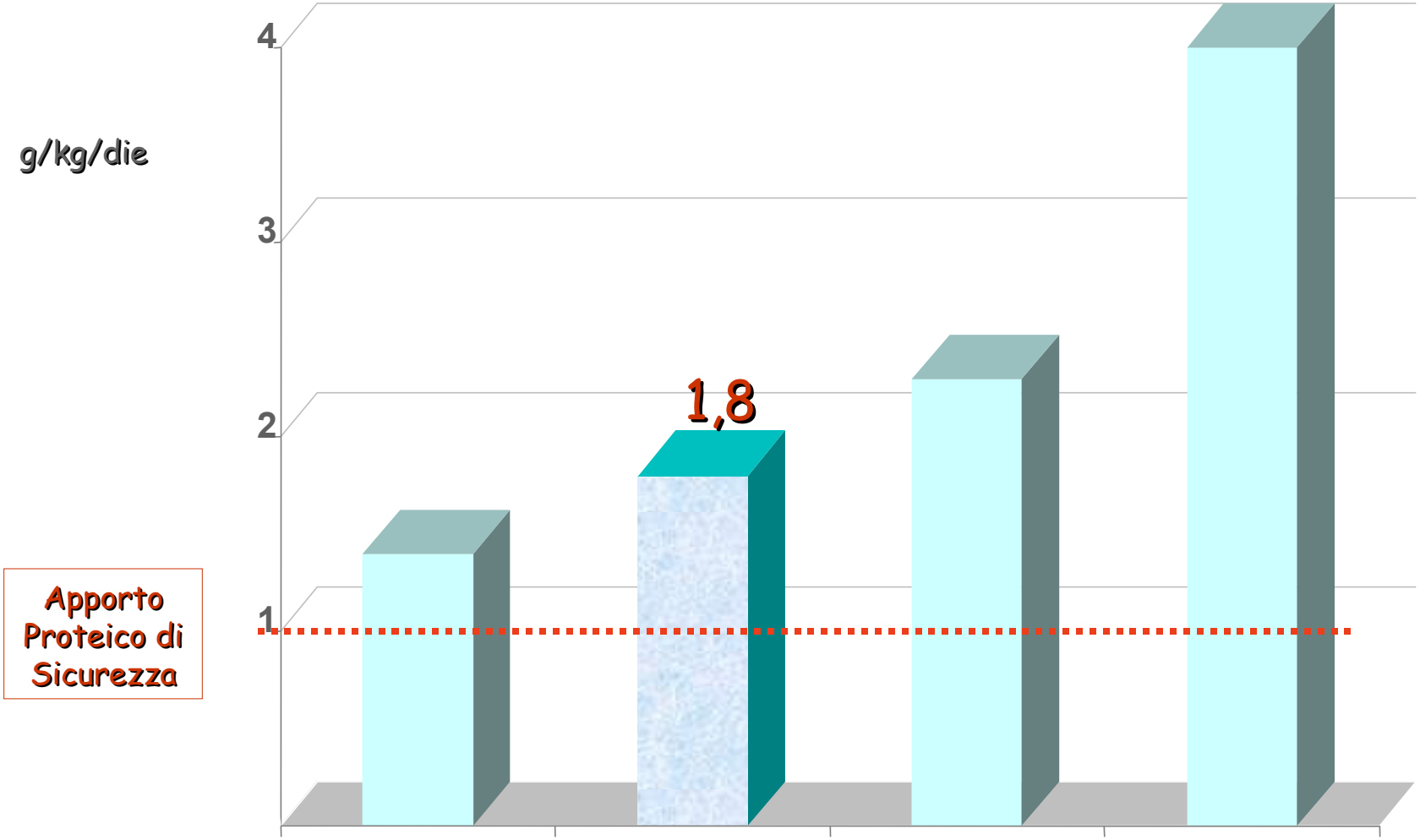


Allattamento misto

+

250 ml

250 ml

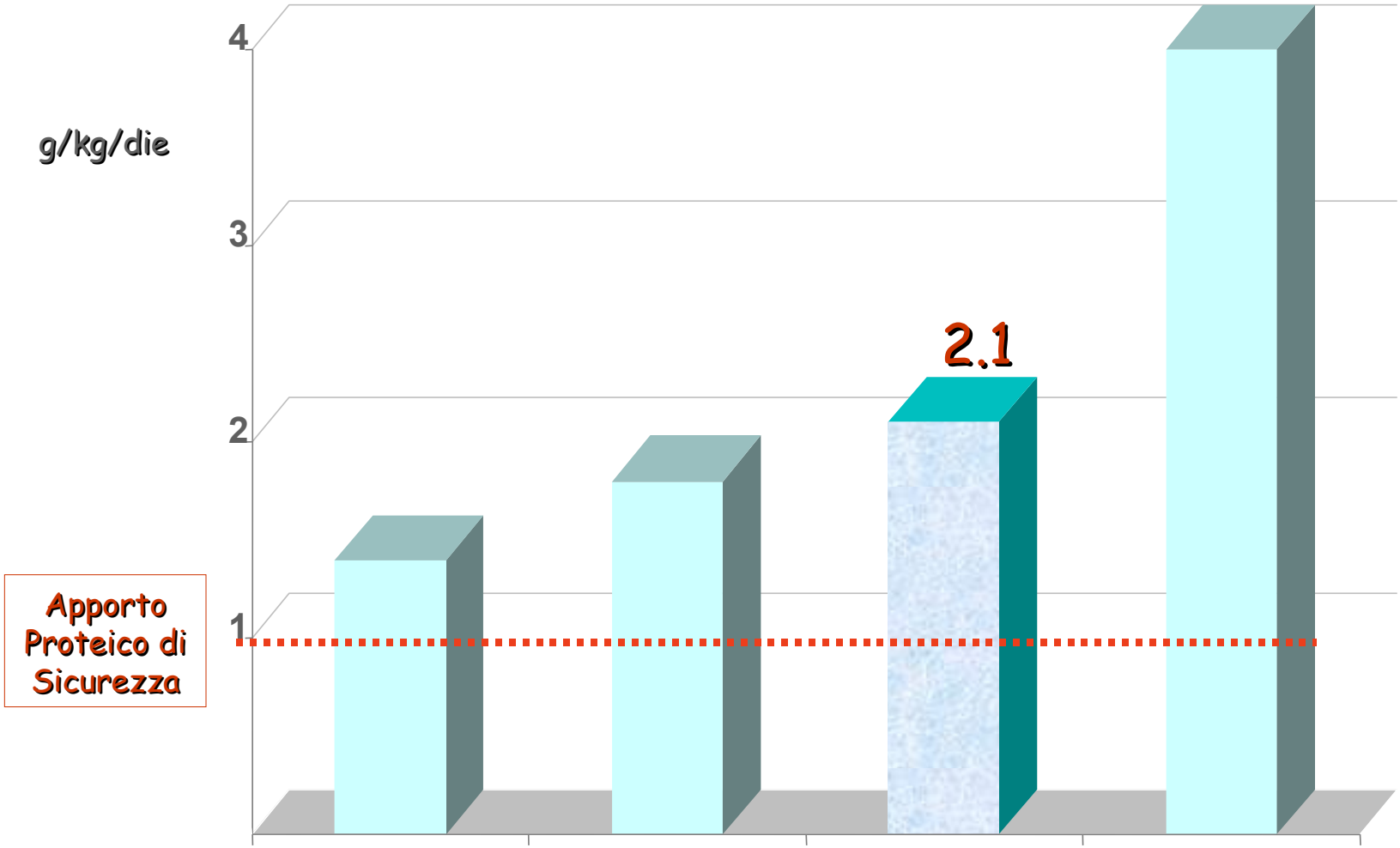


Alimenti di Proseguimento a basso tenore proteico

+

250 ml

250 ml

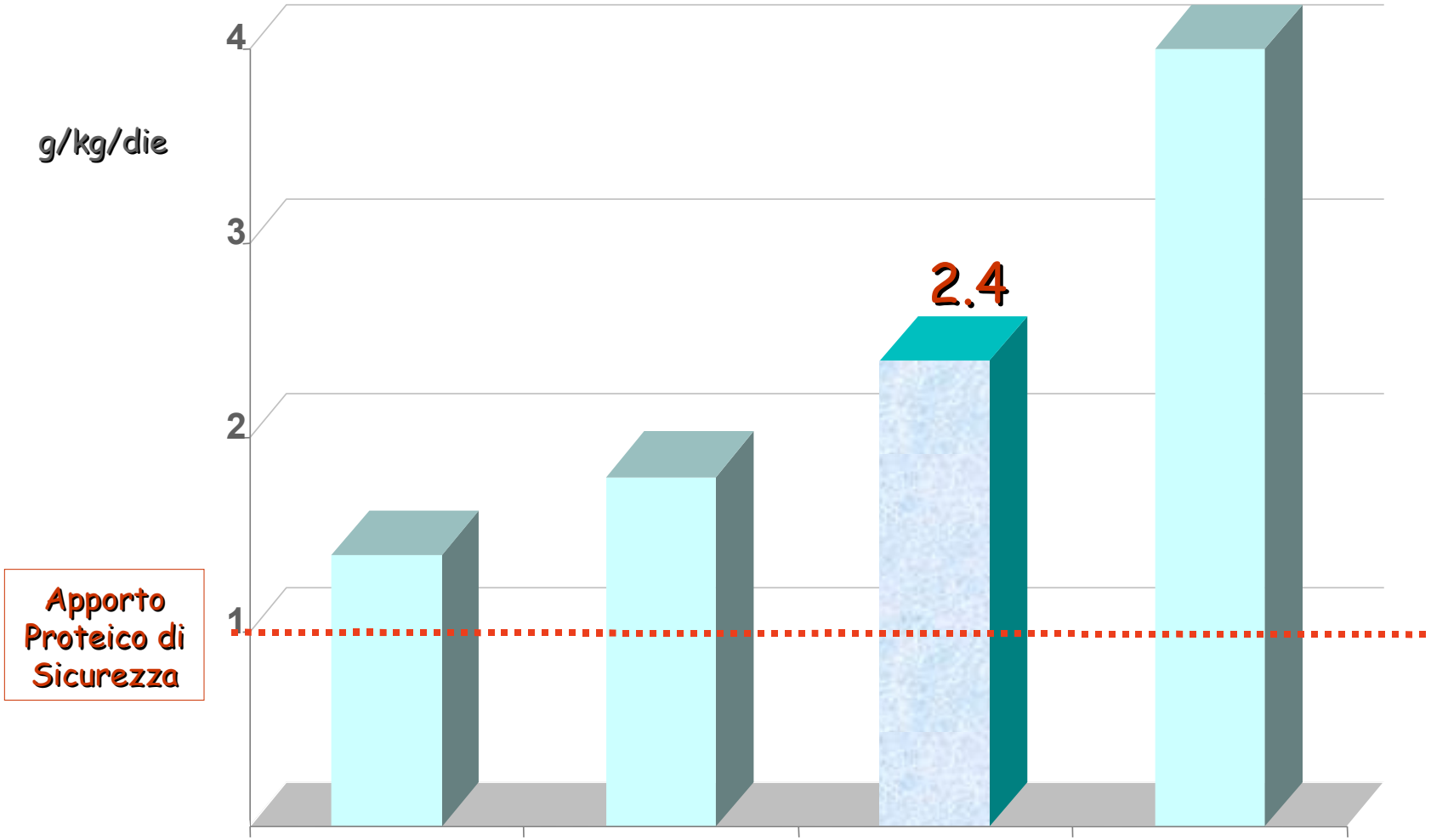


Alimenti di Proseguimento a più elevato tenore proteico

+

250 ml

250 ml

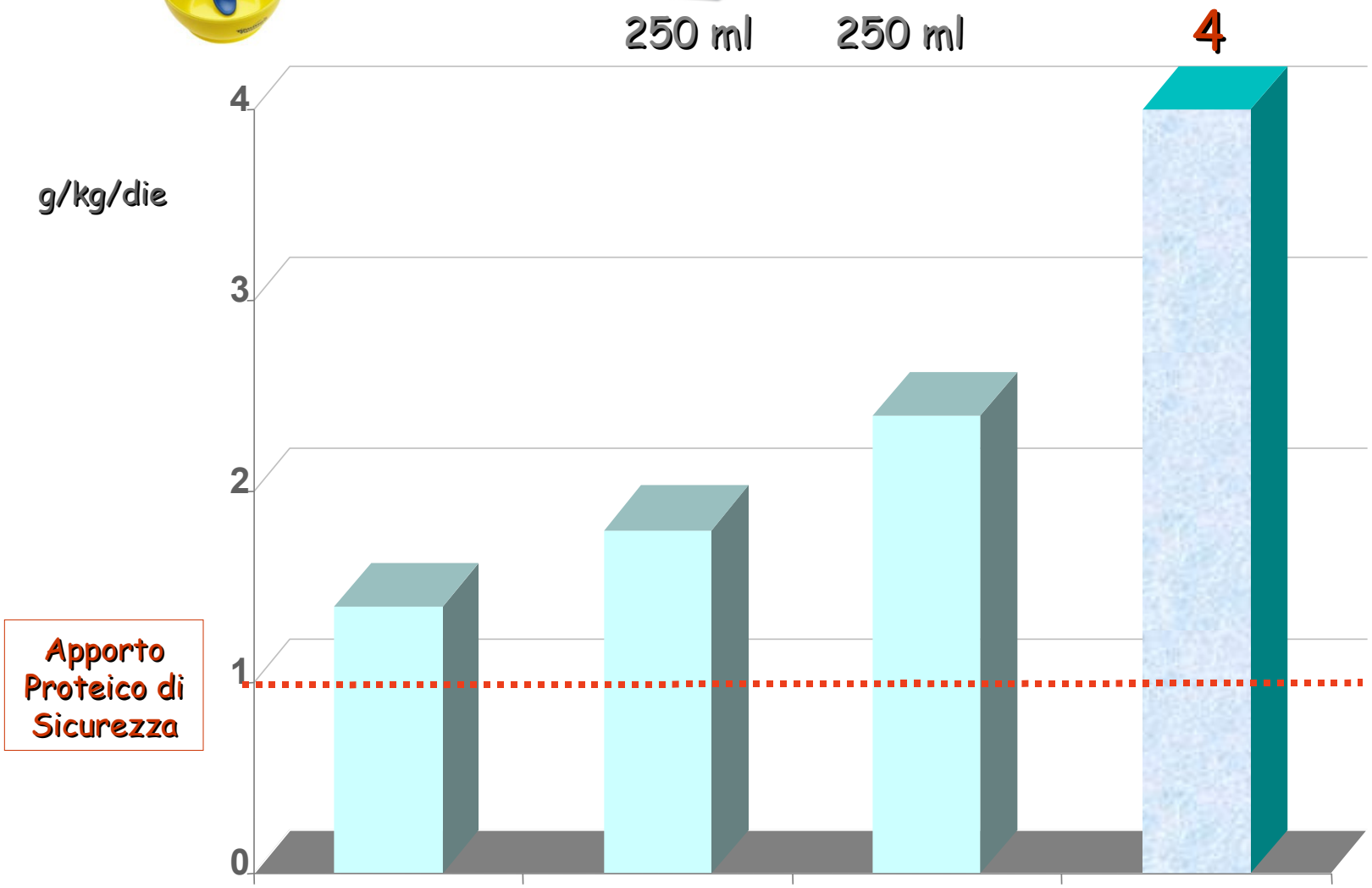


Latte vaccino intero

+

250 ml

250 ml



7° mese

Peso indicativo kg 8

Pranzo	
Cereali	20g
Carote	10g
Zucchine	10g
Cipolle	10g
Olio extravergine di oliva	5g
Formaggio Grana	2g
Carne	20g
Omogeneizzato di pera	40g

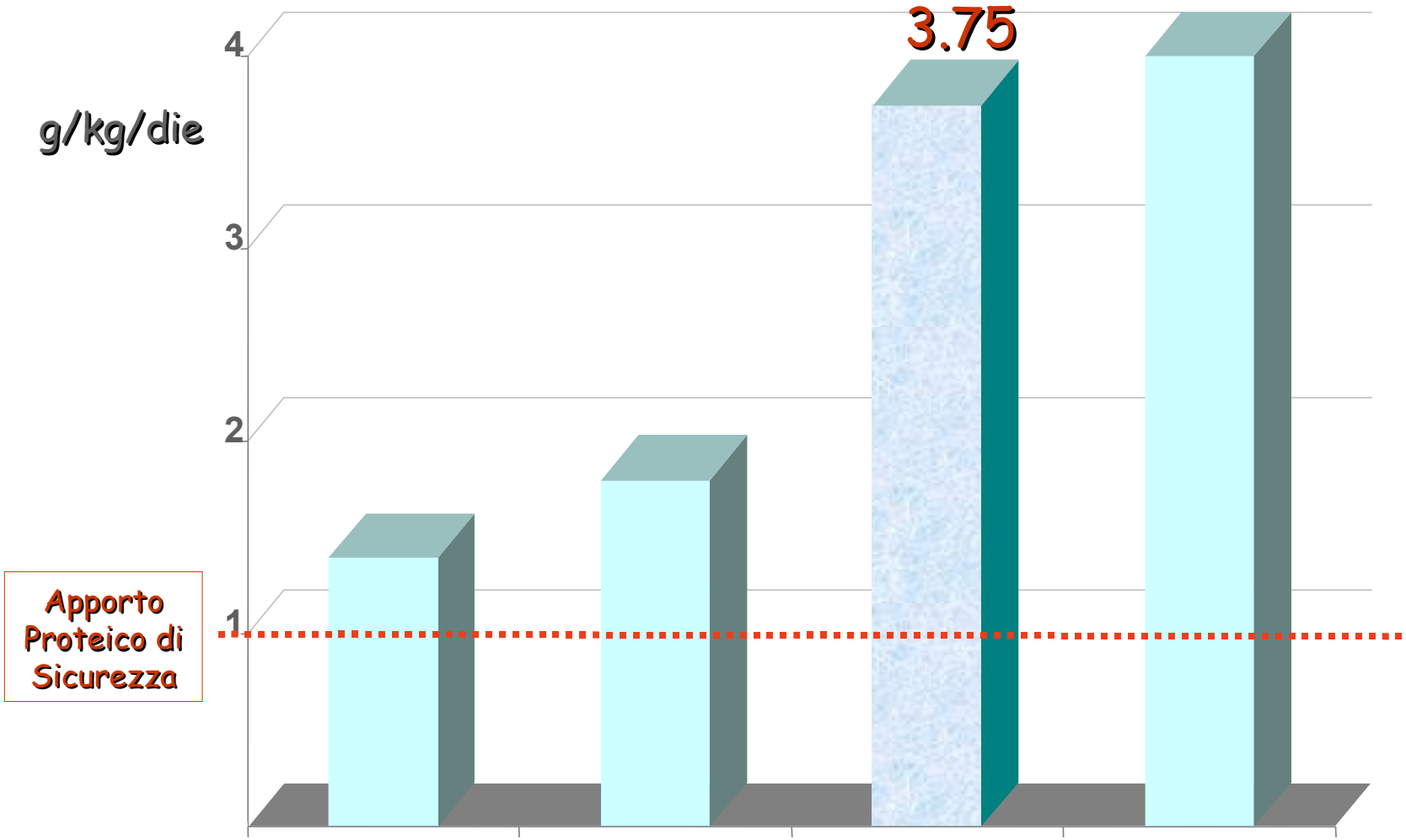
Cena	
Cereali	20g
Carote	10g
Zucchine	10g
Cipolle	10g
Olio extravergine di oliva	5g
Formaggio Grana	2g
Carne	20g
Omogeneizzato di mela	40g

Proteine 30 g

Allattamento artificiale

250 ml

250 ml



Conclusions and Recommendations

During the complementary feeding period,

> 90% of the iron requirements of a breast-fed infant

must be met by complementary foods.

These should provide sufficient bioavailable iron.

Fabbisogno di ferro

Durante il secondo semestre di vita il fabbisogno giornaliero di ferro assorbito è di circa 0.1 mg/Kg di peso corporeo,

3 volte superiore a quello di una adolescente fertile

Mai più, per tutta la vita, il fabbisogno marziale sarà così elevato!

Dallmann PR, 1992

Risorse Marziali

QUANTITÀ ASSUNTA (ml)	CONCENTRAZIONE in FERRO (mg/l)	BIO DISPONIBILITA' (%)	FERRO ASSORBITO (mg)
750	0,35 (con 40 mg/l di Vit.C)	50	0,13
	7-8 (con 90 mg/l di Vit.C)	7-12	0,5 (0,4-0,6)
	0,5	4	0,015

1 parte

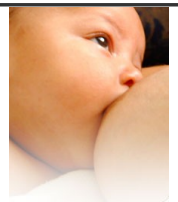
4 parti

750	0,4	4	0,012

Beikost, follow-on milk formulas and growing-up formulas for the prevention of iron deficiency.

V.L. Miniello, L. Armenio The Nest 2001; 10: 6-8

Fabbisogno giornaliero: 0,55 mg/die

LATTE (750 ml)	FERRO assorbito (mg)	FABBISOGNO Ferro di Deposito
	0,13–0,4	Sod + 
	0,5	Sod
	0,012	Non Soddisfatto

Livelli giornalieri raccomandati di assunzione di energia e nutrienti per la popolazione italiana L.A.R.N. (Revisione 1996)

Fabbisogno di ferro da assorbire nel 2° semestre

0,75 mg/die

QUANTITÀ ASSUNTA (ml)	CONCENTRAZIONE in FERRO (mg/l)	BIO DISPONIBILITA' (%)	FERRO ASSORBITO (mg)
600	~ 10 con 50 mg/l di Vit C	2,6- 4,5	0,35

Fabbisogno giornaliero:
0,75 mg/die

LATTE (600 ml)	FERRO assorbito (mg)
	0.13 → 0.1 0.4 → 0.3
	0.35
	0.015 → 0,012

Conclusions and Recommendations

Cow's milk is a poor iron source.

It should not be used as the main drink before 12 months, although small volumes may be added to complementary foods.

Assunzione di latte nei primi 12 mesi in Italia

Puer Project

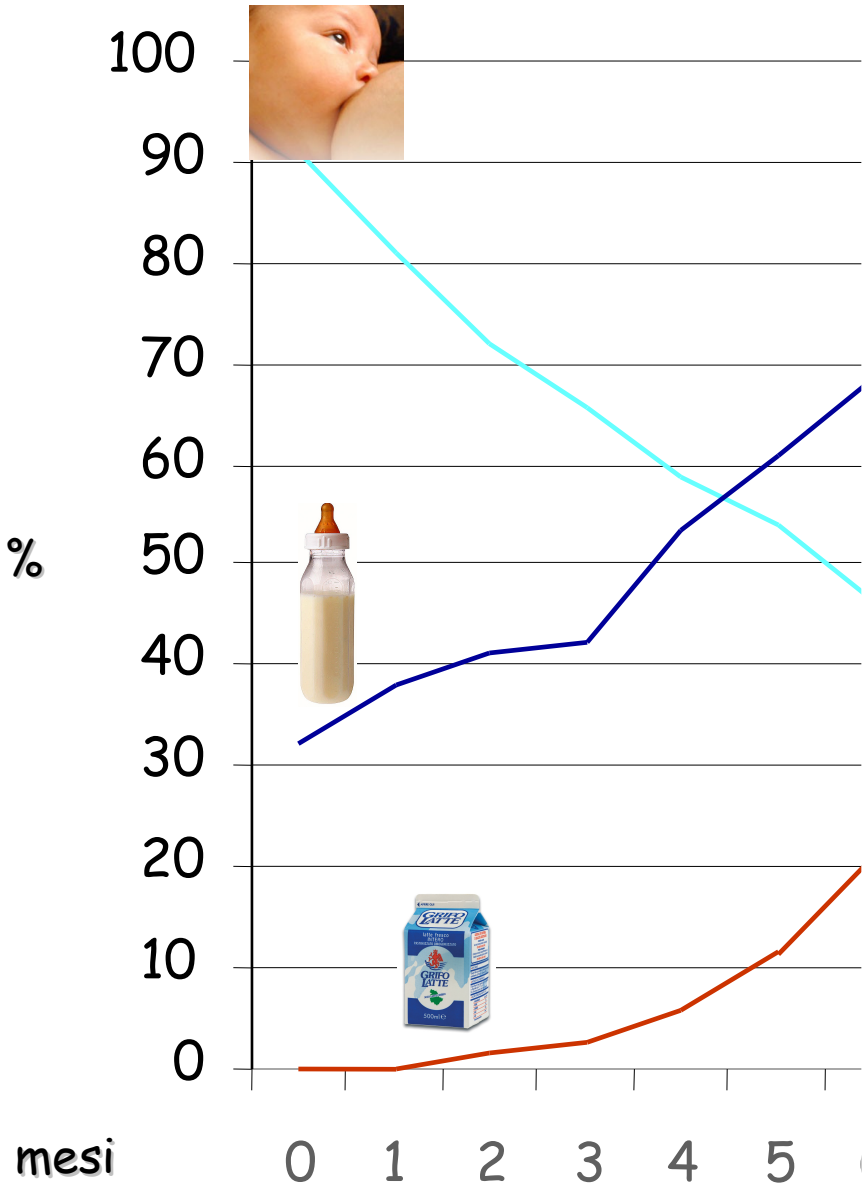
Acta Pædiatr 92: 357–363. 2003

Taylor&Francis healthsciences

CLINICAL OBSERVATIONS

Monitoring breastfeeding rates in Italy: national surveys 1995 and 1999

M Giovannini, G Banderali, G Radaelli[1], V Carmine, E Riva and C Agostoni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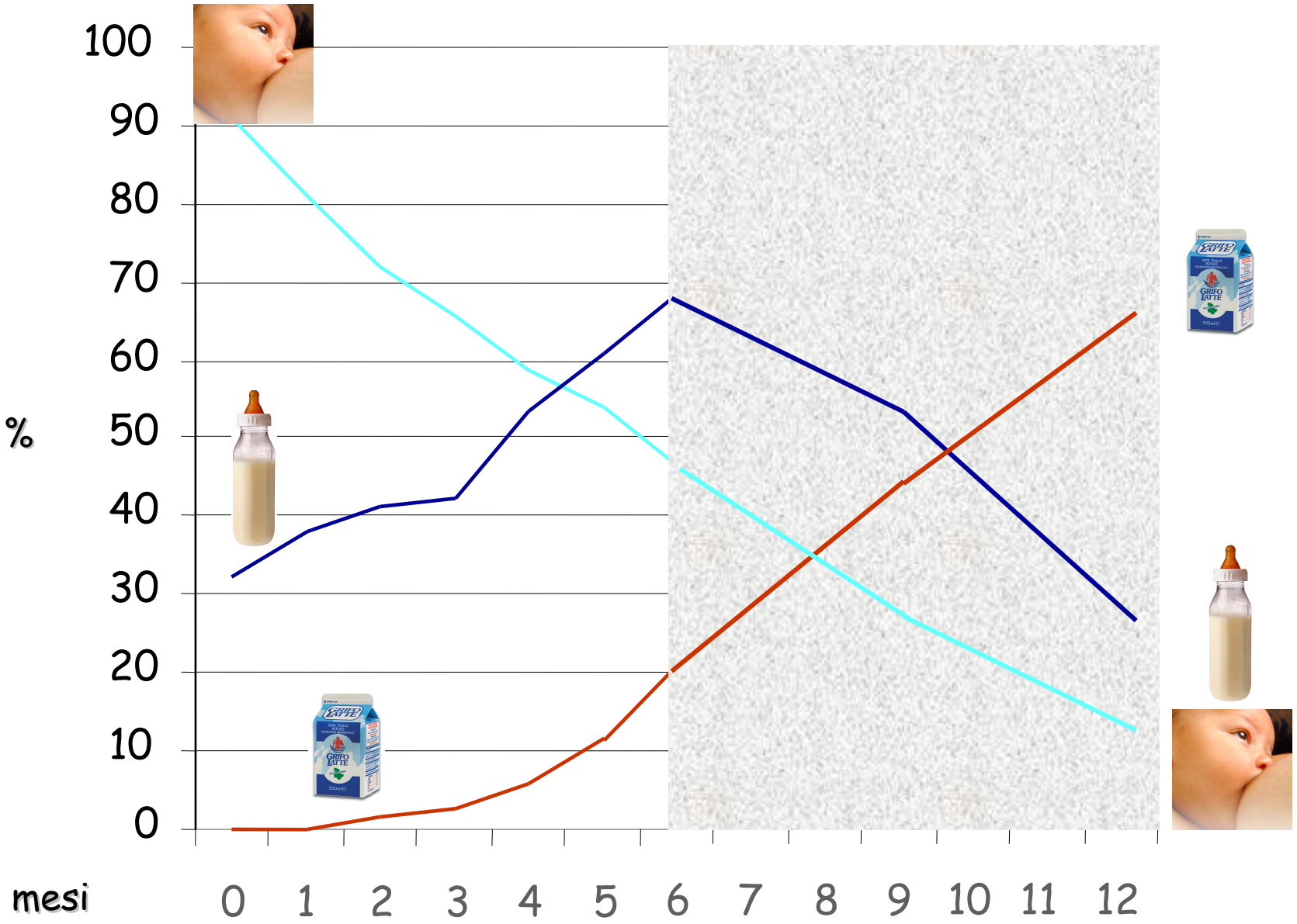
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50
40
30
20
10
0
%
mesi
0 1 2 3 4 5 6 7 8 9 10 11 12

"Il medico abile è un uomo che sa divertire
con successo i suoi pazienti…

tanto, c'è la Natura che pensa a curarli".

Voltaire