Il razionale di vitamine, oligoelementi e probiotici nei latti "starting formula"

G. Bottaro

World Health Organization

Allattamento al seno esclusivo fino ai sei mesi di vita

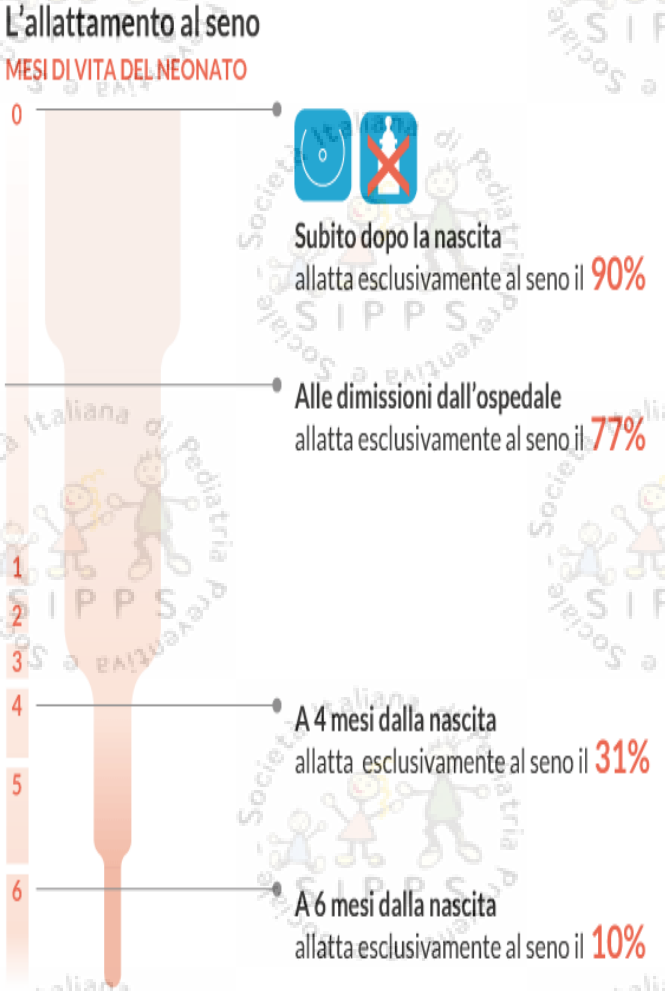
Continuare l'allattamento al seno anche durante il divezzamento fino ai due anni o più.

Latte vaccino vietato almeno fino ai 12 mesi

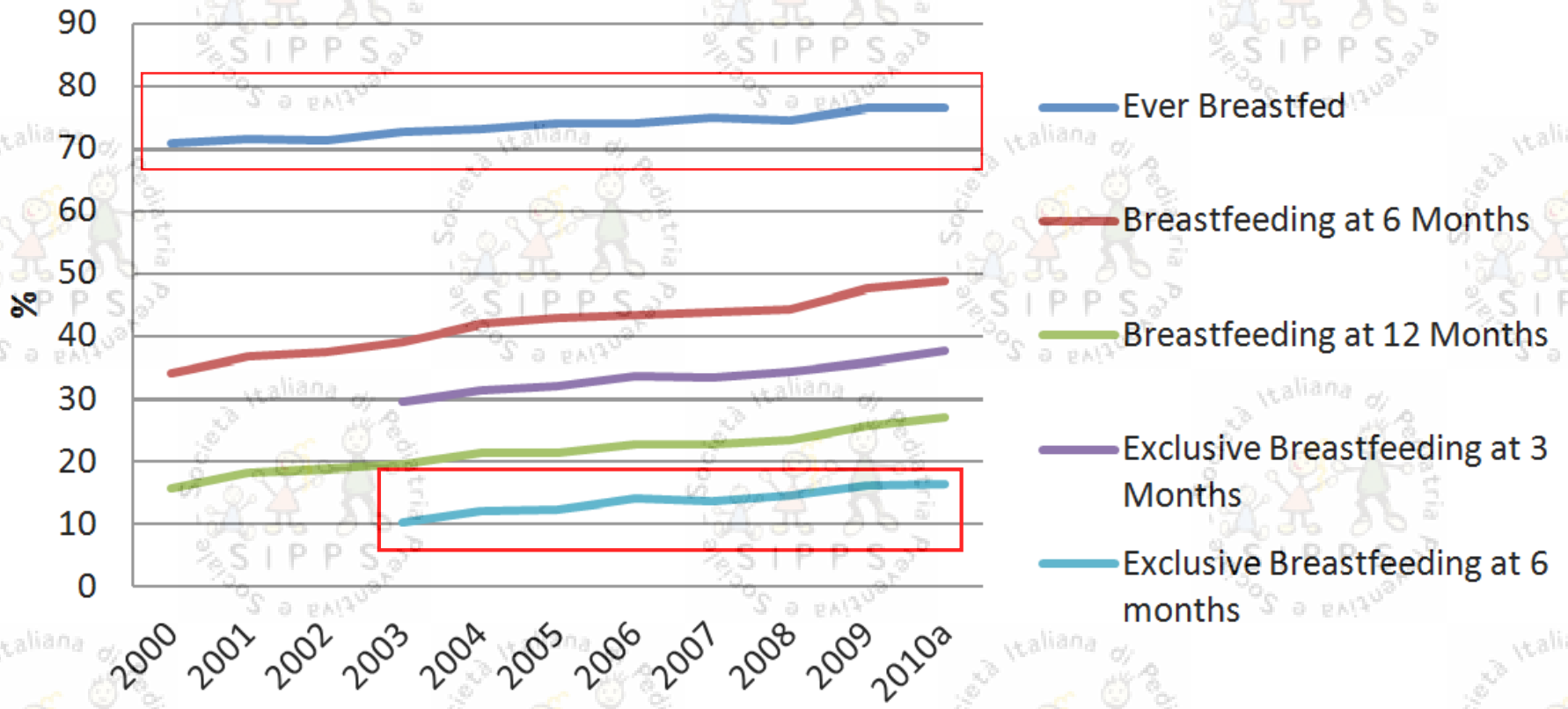
Da Repubblica del 29/9/2015

Il flop degli appelli per allattare al seno: "Nessun paese Ue arriva ai sei mesi"

In Italia due terzi delle mamme rinuncia dopo 16 settimane, in Francia dopo tre vince il biberon



Percent of U.S. Children Breastfed, by Year of Birth



ASP CATANIA

AZIENDA SANITARIA PROVINCIALE

In un workshop organizzato dall'ASP di Catania, in collaborazione con le Aziende Ospedaliere della Provincia, è stato comunicato che, da un'indagine conoscitiva condotta in provincia di Catania,

il 43% delle donne allatta al seno per i primi 6 mesi

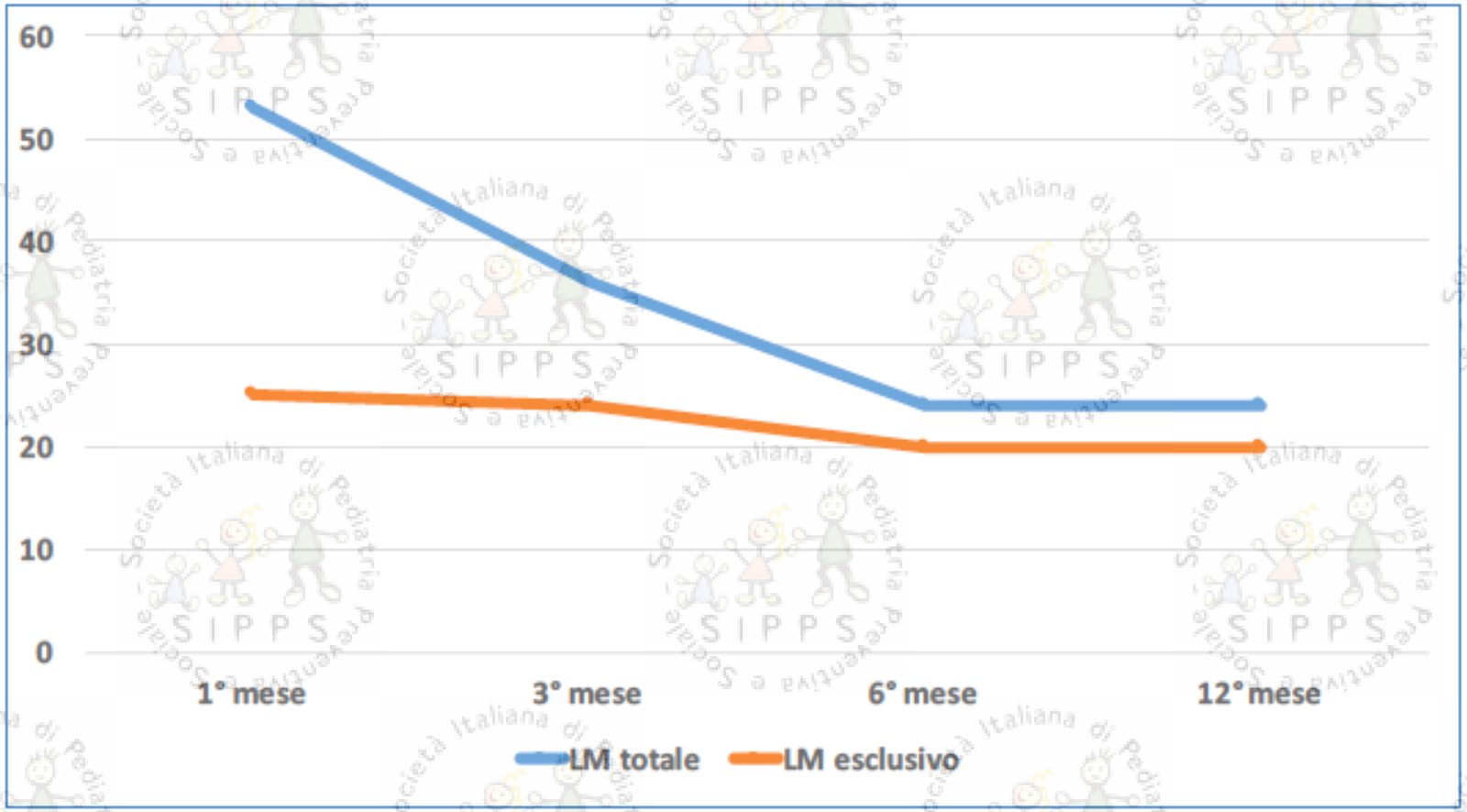
!!!!!!!!!!!!!!!!!!!!!!!!!???????????

DATI PERSONALI

Totale bambini allattati al seno a 6 mesi	**25%**
Bambini allattati al seno esclusivo a 6 mesi	**20%**

Comportamento dell'allattamento al seno in una coorte di 226 lattanti nati dal 2015 al 2017

(dati estratti dai Bilanci di Salute col programma FAITH)



In caso di indisponibilità del latte materno

i latti formulati:

•rappresentano un'alternativa nutrizionalmente adeguata a soddisfare il fabbisogno dei lattanti in buona salute nei primi sei mesi di vita (*formule per lattanti*)

•rappresentano un prodotto complementare all'alimentazione diversificata del bambino (*formule di proseguimento*).

CE

Dir. 91/321/CEE

LATTI “FORMULATI”

Riproducono percentuali di composizione di macro e micronutrienti simili a quelle del latte materno

LATTI “FUNZIONALI”

Introduzione nei latti di composti che possano dare caratteristiche di “dinamicità funzionale” tali da mimare le condizioni metaboliche che si riscontrano negli allattati al seno.

RAZIONALE DI VITAMINE E OLIGOELEMENTI

LARN

LARN PER LE VITAMINE: ASSUNZIONE RACCOMANDATA PER LA POPOLAZIONE (PRI) E ASSUNZIONE ADEGUATA (AI)														
		Vit. C (mg)	Tiamina (mg)	Riboflavina (mg)	Niacina (mg)	Ac pantotenico (mg)	Vit. B_6 (mg)	Biotina (µg)	Folati (µg)	Vit.B_{12} (µg)	Vit. A (µg)	Vit. D (µg)	Vit. E (mg)	Vit. K (µg)
LATTANTI	6-12 mesi	*35*	*0,3*	*0,4*	*5*	*2,0*	*0,4*	*7*	*110*	*0,7*	*450*	*10*	*4*	*10*
BAMBINI-ADOLESCENTI														
	1-3 anni	35	0,4	0,5	7	*2,0*	0,5	*10*	140	0,9	300	15	*5*	*50*
	4-6 anni	45	0,5	0,6	8	*2,5*	0,6	*15*	170	1,1	350	15	*6*	*65*
	7-10 anni	60	0,8	0,8	12	*3,5*	0,9	*20*	250	1,6	500	15	*8*	*90*
Maschi	11-14 anni	90	1,1	1,3	17	*4,5*	1,2	*25*	350	2,2	600	15	*11*	*130*
	15-17 anni	105	1,2	1,6	18	*5,0*	1,3	*30*	400	2,4	700	15	*13*	*140*
Femmine	11-14 anni	80	1,0	1,2	17	*4,5*	1,2	*25*	350	2,2	600	15	*11*	*130*
	15-17 anni	85	1,1	1,3	18	*5,0*	1,3	*30*	400	2,4	600	15	*12*	*140*

LARN PER I MINERALI: ASSUNZIONE RACCOMANDATA PER LA POPOLAZIONE (PRI) E ASSUNZIONE ADEGUATA (AI)																
		Ca (mg)	P (mg)	Mg (mg)	Na (g)	K (g)	Cl (g)	Fe (mg)	Zn (mg)	Cu (mg)	Se (µg)	I (µg)	Mn (mg)	Mo (µg)	Cr (µg)	F (mg)
LATTANTI	6-12 mesi	*260*	*275*	*80*	*0,4*	*0,7*	*0,6*	11	3	*0,2*	*20*	*70*	*0,4*	*10*	*4*	*0,4*
BAMBINI-ADOLESCENTI																
	1-3 anni	**700**	**460**	**80**	*0,7*	*1,7*	*1,0*	**8**	**5**	**0,3**	**19**	*100*	*0,6*	*15*	*7*	*0,7*
	4-6 anni	**900**	**500**	**100**	*0,9*	*2,4*	*1,4*	**11**	**6**	**0,4**	**25**	*100*	*0,8*	*20*	*10*	*1,0*
	7-10 anni	**1100**	**875**	**150**	*1,1*	*3,0*	*1,7*	**13**	**8**	**0,6**	**34**	*100*	*1,2*	*30*	*14*	*1,6*
Maschi	11-14 anni	**1300**	**1250**	**240**	*1,5*	*3,9*	*2,3*	**10**	**12**	**0,8**	**49**	*130*	*1,9*	*50*	*25*	*2,5*
	15-17 anni	**1300**	**1250**	**240**	*1,5*	*3,9*	*2,3*	**13**	**12**	**0,9**	**55**	*130*	*2,7*	*60*	*33*	*3,5*
Femmine	11-14 anni	**1300**	**1250**	**240**	*1,5*	*3,9*	*2,3*	**10/18**	**9**	**0,8**	**48**	*130*	*1,9*	*50*	*21*	*2,5*
	15-17 anni	**1200**	**1250**	**240**	*1,5*	*3,9*	*2,3*	**18**	**9**	**0,9**	**55**	*130*	*2,3*	*60*	*23*	*3,0*

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Medical Position Paper

Global Standard for the Composition of Infant Formula: Recommendations of an ESPGHAN Coordinated International Expert Group

*Berthold Koletzko,[1] †Susan Baker, ‡Geoff Cleghorn, §Ulysses Fagundes Neto, ||Sarath Gopalan, ¶Olle Hernell, #Quak Seng Hock, **Pipop Jirapinyo, ††Bo Lonnerdal, ‡‡Paul Pencharz, §§Hildegard Przyrembel,[2] ||||Jaime Ramirez-Mayans, ¶¶Raanan Shamir, ##Dominique Turck, ***Yuichiro Yamashiro, and †††Ding Zong-Yi

TABLE 1. *Proposed compositional requirements of infant formula*

Component	Unit	Minimum	Maximum
Energy	kcal/100 ml	60	70
Proteins			
Cows' milk protein	g/100 kcal	1.8*	3
Soy protein isolates	g/100 kcal	2.25	3
Hydrolyzed cows' milk protein	g/100 kcal	1.8†	3
Lipids			
Total fat	g/100 kcal	4.4	6.0
Linoleic acid	g/100 kcal	0.3	1.2
α-linolenic acid	mg/100 kcal	50	NS
Ratio linoleic/α-linolenic acids		5:1	15:1
Lauric + myristic acids	% of fat	NS	20
Trans fatty acids	% of fat	NS	3
Erucic acid	% of fat	NS	1
Carbohydrates			
Total carbohydrates‡	g/100 kcal	9.0	14.0
Vitamins			
Vitamin A	μg RE/100 kcal§	60	180
Vitamin D_3	μg/100 kcal	1	2.5
Vitamin E	mg α-TE/100 kcal‖	0.5¶	5
Vitamin K	μg/100 kcal	4	25
Thiamin	μg/100 kcal	60	300
Riboflavin	μg/100 kcal	80	400
Niacin#	μg/100 kcal	300	1500
Vitamin B_6	μg/100 kcal	35	175
Vitamin B_{12}	μg/100 kcal	0.1	0.5
Pantothenic acid	μg/100 kcal	60	300
Folic acid	μg/100 kcal	10	50
Vitamin C	mg/100 kcal	10	30
Biotin	μg/100 kcal	1.5	7.5
Minerals and trace elements			
Iron (formula based on cows' milk protein and protein hydrolysate)	mg/100 kcal	0.3**	1.3
Iron (formula based on soy protein isolate)	mg/100 kcal	0.45	2.0
Calcium	mg/100 kcal	50	140
Phosphorus (formula based on cows' milk protein and protein hydrolysate)	mg/100 kcal	25	90
Phosphorus (formula based on soy protein isolate)	mg/100 kcal	30	100
Ratio calcium/phosphorus	mg/mg	1:1	2:1
Magnesium	mg/100 kcal	5	15
Sodium	mg/100 kcal	20	60
Chloride	mg/100 kcal	50	160
Potassium	mg/100 kcal	60	160
Manganese	μg/100 kcal	1	50
Fluoride	μg/100 kcal	NS	60
Iodine	μg/100 kcal	10	50
Selenium	μg/100 kcal	1	9
Copper	μg/100 kcal	35	80
Zinc	mg/100 kcal	0.5	1.5
Other substances			
Choline	mg/100 kcal	7	50
Myo-inositol	mg/100 kcal	4	40
L-carnitine	mg/100 kcal	1.2	NS

*The determination of the protein content of formulae based on non-hydrolyzed cows' milk protein with a protein content between 1.8 and 2.0 g/100 kcal should be based on measurement of true protein ([total N minus NPN] × 6.25) (31).

†Formula based on hydrolyzed milk protein with a protein content less than 2.25 g/100 kcal should be clinically tested.

‡Sucrose (saccharose) and fructose should not be added to infant formula.

§1 μg RE (retinol equivalent) = 1 μg all-trans retinol = 3.33 IU vitamin A. Retinol contents shall be provided by preformed retinol, while any contents of carotenoids should not be included in the calculation and declaration of vitamin A activity.

‖1 mg α-TE (α-tocopherol equivalent) = 1 mg d-α-tocopherol.

¶Vitamin E content shall be at least 0.5 mg α-TE per g PUFA, using the following factors of equivalence to adapt the minimal vitamin E content to the number of fatty acid double bonds in the formula: 0.5 mg α-TE/g linoleic acid (18:2n-6); 0.75 mg α-TE/g α-linolenic acid (18:3n-3); 1.0 mg α-TE/g arachidonic acid (20:4n-6); 1.25 mg α-TE/g eicosapentaenoic acid (20:5n-3); 1.5 mg α-TE/g docosahexaenoic acid (22:6n-3).

#Niacin refers to preformed niacin.

**In populations where infants are at risk of iron deficiency, iron contents higher than the minimum level of 0.3 mg/100 kcal may be appropriate and recommended at a national level.

NS, not specified.

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Component	Unit	Minimum	Maximum
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Total carbohydrates‡	g/100 kcal	9.0	14.0
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Vitamin A	μg RE/100 kcal§	60	180
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Vitamin E	mg α-TE/100 kcal‖	0.5¶	5
Vitamin K	μg/100 kcal	4	25
Thiamin	μg/100 kcal	60	300
Riboflavin	μg/100 kcal	80	400
Niacin#	μg/100 kcal	300	1500
Vitamin B_6	μg/100 kcal	35	175
Vitamin B_{12}	μg/100 kcal	0.1	0.5
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Calcium	mg/100 kcal	50	140
Phosphorus (formula based on cows' milk protein and protein hydrolysate)	mg/100 kcal	25	90
Phosphorus (formula based on soy protein isolate)	mg/100 kcal	30	100
Ratio calcium/phosphorus	mg/mg	1:1	2:1
Magnesium	mg/100 kcal	5	15
Sodium	mg/100 kcal	20	60
Chloride	mg/100 kcal	50	160
Potassium	mg/100 kcal	60	160
Manganese	µg/100 kcal	1	50
Fluoride	µg/100 kcal	NS	60
Iodine	µg/100 kcal	10	50
Selenium	µg/100 kcal	1	9
Copper	µg/100 kcal	35	80
Zinc	mg/100 kcal	0.5	1.5
Other substances			
Choline	mg/100 kcal	7	50
Myo-inositol	mg/100 kcal	4	40
L-carnitine	mg/100 kcal	1.2	NS

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NS, not specified.

Latti a confronto

COSTITUENTI	LATTE UMANO	LATTE VACCINO	LINEE GUIDA UE
CALORIE (Kcal)	**65-75**	**66-79**	**60-70**
PROTEINE TOTALI gr	**0,9-1,2**	**3,2-4,0**	**1,8-3**
rapporto caseina/siero proteine	0,7	4,5	
azoto non proteico (mg)	50	28	
GLUCIDI TOTALI gr	**6,5-7,5**	**4,5-5,0**	**9-14**
lattosio	6	4,8	≥4,5
LIPIDI TOTALI gr	**3,5-4,0**	**3,5-5,2**	**4-4,6**
grassi saturi (%)	45	65	
grassi insaturi (%)	55	35	
rapporto saturi/insaturi	0,8	1,9	
ω3/ω6	<5	>5	
MINERALI TOTALI mg	**150-250**	**700-750**	**250-500**
Na	16,1	57,5	20-60
Ca	33	137	50-140
P	15	92	25-90
Ca/P	2,1	1,3	1-2
Fe	0,05	0,04	0,3-1,3
Zn	0,5	0,4	0,5-1,5
I	0,003	0,2	0,1-0,5
VITAMINE			
A UI	200	100	60-180
D UI	2,2	1,4	1-3
K mcg	1,5	6	4-20
Complesso B mcg	5,5	7,1	2-6,5
C mcg	4-5,5	1,1	10

Formule a confronto

VALORI NUTRIZIONALI MEDI

Analisi media	per 100 g di polvere	per 100 ml di prodotto ricostituito al 13,5 % p/v
Valore energetico	Kcal 503	Kcal 68
	Kj 2103	Kj 284
Proteine (N x 6,25)	g 9,6	g 1,3
Sieroproteine/Caseina	50/50	50/50
Carboidrati (p.d.)	g 54,5	g 7,4
di cui: Lattosio	g 43	g 5,8
Maltodestrine	g 10,4	g 1,4
Grassi	g 27,4	g 3,7
di cui: Acido linoleico	g 4,0	g 0,54
Acido α-linolenico	mg 360	mg 49
Fibra alimentare (GOS)	g 3,0	g 0,4
Minerali	g 2,2	g 0,3
di cui: Calcio	mg 348	mg 47
Fosforo	mg 246	mg 33
Magnesio	mg 34	mg 4,6
Ferro	mcg 6000	mcg 810
Zinco	mcg 3000	mcg 405
Rame	mcg 304	mcg 41
Iodio	mcg 148	mcg 20
Manganese	mcg 33,3	mcg 4,5
Selenio	mcg 11,9	mcg 1,6
Sodio	mg 141	mg 19
Potassio	mg 548	mg 74
Cloro	mg 259	mg 35
Vitamine		
di cui: Vitamina A	mcg 444	mcg 60
Vitamina E	mg 11	mg 1,5
Vitamina B1	mcg 741	mcg 100
Vitamina B2	mcg 1185	mcg 160
Vitamina B6	mcg 489	mcg 66
Vitamina B12	mcg 1,5	mcg 0,2
Vitamina PP	mg 3,63	mg 0,49
Acido pantotenico	mg 5,18	mg 0,70
Acido folico	mcg 118	mcg 16
Vitamina C	mg 74	mg 10
Vitamina D3	mcg 8,9	mcg 1,2
Biotina	mcg 22,2	mcg 3,0
Vitamina K1	mcg 66,7	mcg 9,0
Taurina	mg 50,4	mg 6,8
Colina	mg 104,4	mg 14,1
Inositolo	mg 96	mg 13
Nucleotidi aggiunti	mg 17,6	mg 2,37
Osmolarità		mOsm/L 260

VALORI NUTRIZIONALI MEDI

VALORI ANALITICI	Per 100 ml al 13,6%
Valore energetico	
Proteine (N × 6,25)	
Sieroproteine	
Caseina	
Carboidrati	
Zuccheri	
glucosio	
lattosio	
Grassi	
Saturi	
Monoinsaturi	
Polinsaturi	
ac. linoleico	
ac. α-linolenico	
ac. arachidonico (AA)	
ac. eicosapentaenoico (EPA)	
ac. docosaesaenoico (DHA)	
Fibre alimentari	
Minerali	
Sodio	
Potassio	
Cloro	
Calcio	
Fosforo	
Magnesio	
Ferro	
Zinco	
Rame	
Iodio	
Selenio	
Manganese	
Fluoro	
Rapporto calcio/fosforo	
Vitamine	
Vitamina A	
Vitamina D	
Vitamina E	
Vitamina K	
Vitamina B1	
Vitamina B2	
Niacina	
Acido pantotenico	
Vitamina B6	
Acido folico	
Vitamina B12	
Biotina	
Vitamina C	
L-carnitina	
Colina	
Inositolo	
Taurini	
Nucleotidi	
Uridina 5'-monofosfato	
Acido 5'-monofosfato	
Adenosina 5'-monofosfato	
Guanosina 5'-monofosfato	
Citidina 5'-monofosfato	

COMPOSIZIONE MEDIA

Per			100g	100ml	100kcal
Valori Energetici		kcal	498,5	64,8	100
		kJ	2083,7	270,9	418
Osmolarità	268 mOsm/L				
Proteine		g	11	1,4	2,2
Rapp. caseina/siero	40/60				
Idrolizzate	NO				
Carboidrati		g	55,6	7,2	11,2
Maltodestrina	21%	g	11,7	1,5	
Lattosio	78%	g	43,3	5,6	
Destrosio	1%	g	0,6	0,1	
Grassi		g	25,5	3,3	5,1
Saturi		g	11,7	1,5	2,3
Monoinsaturi		g	7,1	0,9	1,4
Polinsaturi		g	5,4	0,7	1,1
Rapp. vegetali/animali	99/1				
Acido linoleico		g	4,4	0,6	0,9
Acido α-Linolenico		mg	335	43,6	67,2
ARA		mg	80	10,4	16
DHA		mg	75	9,8	15
Galacto-oligosaccaridi (GOS)		g	1,9	0,2	0,4
Fibre		g	1,3	0,2	0,3
Minerali					
Sodio		mg	150	19,5	30,1
Potassio		mg	480	62,4	96,3
Cloruro		mg	355	46,2	71,2
Calcio		mg	350	45,5	70,2
Fosforo		mg	230	29,9	46,1
Magnesio		mg	45	5,9	9
Ferro		mg	5,8	0,8	1,2
Zinco		mg	4,5	0,6	0,9
Iodio		µg	75	9,8	15
Rame		µg	350	45,5	70,2
Manganese		µg	35	4,6	7
Selenio		µg	10	1,3	2
Fluoruro		µg	<490	<65	<100
Vitamine					
A		µg RE	450	58,5	90,3
B1		µg	400	52	80,2
B2		µg	1000	130	200,6
B6		µg	300	39	60,2
B12		µg	1,5	0,2	0,3
C		mg	60	7,8	12
D3		µg	7,5	1	1,5
E		mg α-TE	8,7	1,1	1,7
K1		µg	30	3,9	6
Niacina		mg	4,5	0,6	0,9
Acido Pantotenico		mg	2,4	0,3	0,5
Acido Folico		µg	60	7,8	12
Biotina		µg	15	2	3
Colina		mg	80	10,4	16
Inositolo		mg	60	7,8	12
Taurina		mg	40	5,2	8
L-carnitina		mg	8	1	1,6
Nucleotidi		mg	21,8	2,8	4,4

Vitamine e oligoelementi

i lattanti alimentati con formula esclusiva assumono, giornalmente un quantitativo adeguato di vitamine e oligoelementi

Dir. 91/321/CEE

Storia

carente nutrizione giovanile → prevenzione della malnutrizione e degli stati carenziali

Recente Passato

prosperità economica → miglioramento della nutrizione → ridotta attenzione della malnutrizione e degli stati carenziali

Presente e Futuro

Alimentazione selettiva, Regimi dietetici particolari (scelte culturali, filosofiche, immigrazione) - DCA → **rischio disvitaminosi**

Rachitismo
(carenza vitamina D)

Scorbuto
(carenza vitamina C)

Beriberi
(carenza vitamina B_1)

Pellagra
(carenza vitamina B_3)

Anemia
(carenza vitamina B_{12} e Ac. Folico)

Emorragie
(carenza vitamina K)

Dist. Neurologici
(carenza vitamina B_6)

Deficit visivo
(carenza vitamina B_2)

nutrients

Article

Micronutrient Deficiencies among Breastfeeding Infants in Tanzania

Alexandra L. Bellows [1,2,*], Emily R. Smith [2,3], Alfa Muhihi [4], Christina Briegleb [2], Ramadhani A. Noor [5], Salum Mshamu [6], Christopher Sudfeld [2], Honorati Masanja [7] and Wafaie W. Fawzi [1,2,5]

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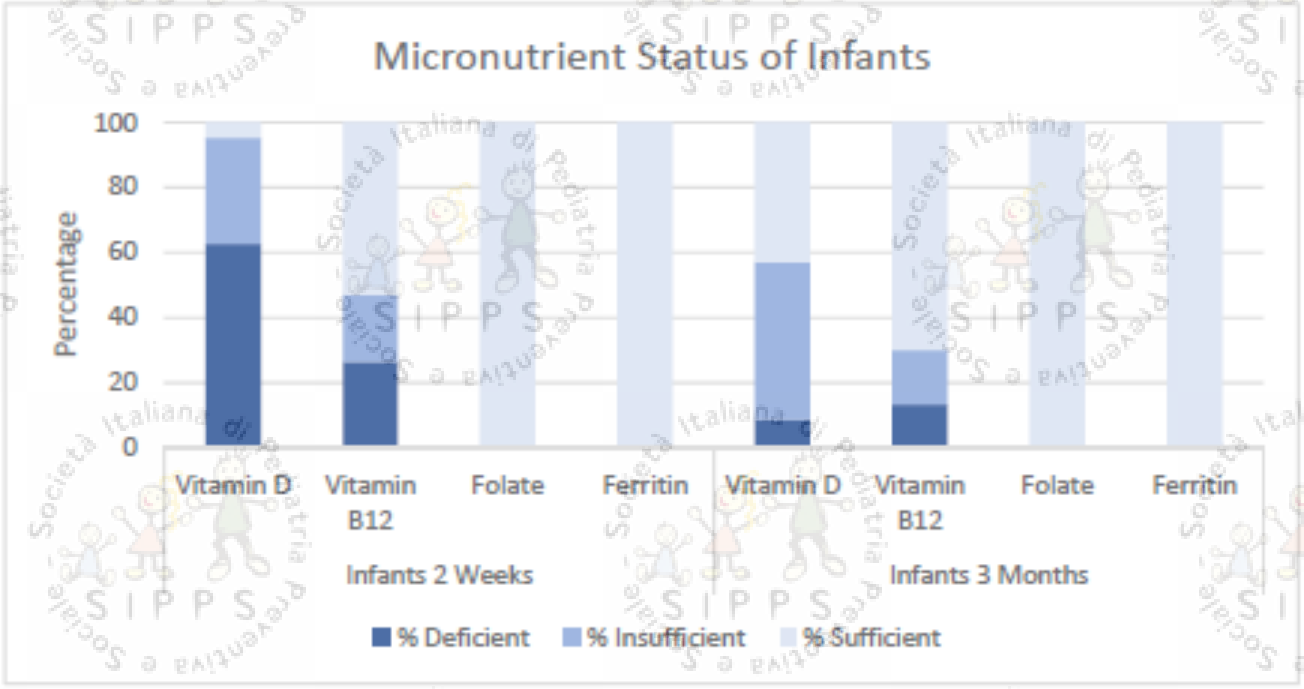

Guez et al. BMC Pediatrics 2012, 12:85
http://www.biomedcentral.com/1471-2431/12/85

BMC Pediatrics

CASE REPORT Open Access

Severe vitamin B12 deficiency in an exclusively breastfed 5-month-old Italian infant born to a mother receiving multivitamin supplementation during pregnancy

Sophie Guez, Gabriella Chiarelli, Francesca Menni, Simona Salera, Nicola Principi and Susanna Esposito*

Conclusions

This case of a 5-month-old Italian infant with severe pancytopenia and neurological impairment born to a vegan mother who had received B12 supplementation during pregnancy but not during lactation seems to be particularly interesting for various reasons.

The first is the fact that it is very important to be aware that vitamin B12 and iron deficiency can frequently occur in infants born to vegan mothers (who are increasing in number in these last years) and these deficits are a preventable cause of neurodevelopmental delay. The second is the fact that the mother was treated with a multivitamin preparation that provided 2.5 μg/day of vitamin B12, an amount that is quite similar to the 2.6 μg/day recommended for pregnant women by health authorities [5]. Despite this, the infant showed clinical signs clearly attributable to vitamin B12 deficiency (such as a failure to thrive and pallor) in the first months of life, which suggests that the recommended amount of vitamin B12 is not enough to avoid the early development of disease in the infants of

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CASE STUDY

Cerebral Atrophy in a Vitamin B12-deficient Infant of a Vegetarian Mother

Although brisk reflexes and cranial nerve examination were normal on admission, he was lethargic, generally hypotonic, lacking smiling and failing to follow objects visually. His weight (8,600 g) and length (71 cm) were on the 10-25th percentile, and his head-circumference (45.5 cm) was on the 25th percentile. The results of general physical examination were normal; however, the case was determined to show rhagades around the angles of both eyelids and mouth as seen in the photo (Figure 1) [The baby's mother provided written approval to the authors to use the photograph in this case study]. Haemoglobin level, granulocyte and platelet counts were 8.8 g/dL, $6.02 \times 10^3/mm^3$, and $308 \times 10^3/mm^3$ respectively. Mean corpuscular volume, reticulocyte count, red blood cell count, and haematocrit were 97.3 fL (reference range 80-96 fL), $6 \times 10^3/mm^3$, $2.63 \times 10^6/mm^3$, and 21.3% respectively. The neu-

Figure 2. Initial MR images: axial (A) and coronal (B) T2-weighted images showed severe cerebral atrophy with enlargement of cortical sulci and subarachnoid spaces (arrows)

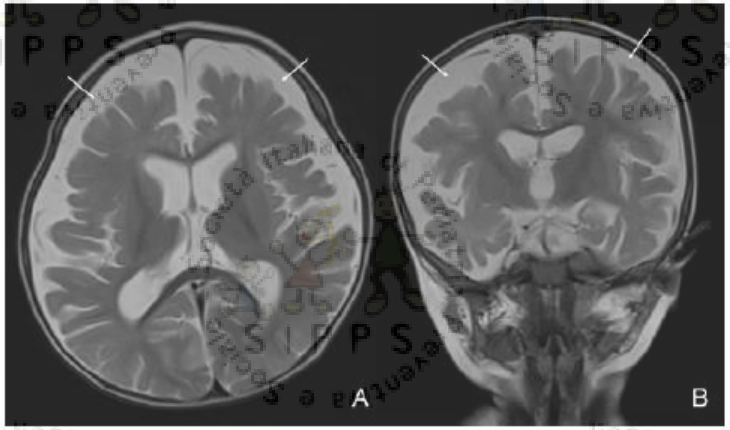
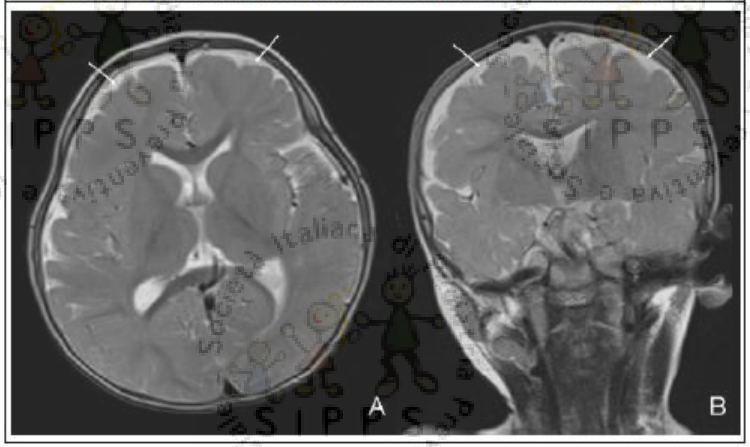


Figure 3. Control MR images after therapy. Axial (A) and coronal (B) T2-weighted images demonstrated recovery of cerebral atrophy. Subarachnoid space width was in normal range (arrows)



Original Article

Screening for inadequate dietary vitamin B-12 intake in South Asian women using a nutrient-specific, semi-quantitative food frequency questionnaire

Gael Janine Mearns PhD[1], Elaine Carolyn Rush MNZM, PhD[2]

Table 1. Dietary B-12 intake by dietary practice group

	n	25th‡	Median†	75th‡
Lactovegetarian	26	1.0¶	1.8¶	3.1
Lactoovovegetarian	7	1.2¶	1.6¶	2.1
White meat-eating	5	1.1¶	1.6¶	3.7
White and red meat-eating	22	3.1	5.5	7.1

†Measured in µg/day.
‡Tukey Hinges interquartile ranges.
¶Less than both the RDA of 2.4 µg/day and the EAR of 2.0 µg/day

Table 2. B-12 biomarkers by vegetarian or non-vegetarian dietary practices

Biomarker	Dietary practice	Insufficient†	Sufficient†
Serum B-12	Vegetarian	21 (64)‡,	12 (36)¶
	Non-vegetarian	9 (33)‡,	18 (67)¶

Journal of Pediatric Gastroenterology and Nutrition
49:112–125 © 2009 by European Society for Pediatric Gastroenterology, Hepatology, and Nutrition and North American Society for Pediatric Gastroenterology, Hepatology, and Nutrition

Special Feature

Breast-feeding: A Commentary by the ESPGHAN Committee on Nutrition

ESPGHAN Committee on Nutrition: *[1]Carlo Agostoni, †Christian Braegger, ‡Tamas Decsi, §Sanja Kolacek, ||[1]Berthold Koletzko, ¶[1]Kim Fleischer Michaelsen, #Walter Mihatsch, **Luis A. Moreno, ††John Puntis, ‡‡[2]Raanan Shamir, §§Hania Szajewska, ||||[3]Dominique Turck, and ¶¶Johannes van Goudoever

Breast milk is the natural food for infants. The degree of health benefits derived from breast-feeding is higher in developing countries than in developed countries, and is inversely proportional to the socioeconomic level of the population, which is obviously lower in developing than in developed countries. Evidence from developing countries demonstrates that under conditions of poor hygiene breast-feeding can be a matter of life or death. It has been estimated that 1.3 to 1.45 million deaths in 42 high-mortality countries could be prevented by increased levels of breast-feeding (1,2). In a recent analysis of the health consequences of child undernutrition, it was estimated that suboptimal breast-feeding was responsible for 1.4 million child deaths and 44 million disability-adjusted life-years, equivalent to 10% of the disability-adjusted life-years in children younger than 5 years (3).

Breast-feeding is also associated with a demonstrable impact on infant morbidity in industrialised countries, for

Received January 16, 2009; accepted January 19, 2009.

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[1]Guest; [2]Committee Chair; [3]Committee Secretary.

The authors report no conflicts of interest.

How many child deaths can we prevent this year?

Lancet 2003; **362:** 65–71

*Gareth Jones, Richard W Steketee, Robert E Black, Zulfiqar A Bhutta, Saul S Morris, and the Bellagio Child Survival Study Group**

	Estimated under-5 deaths prevented	
	Number of deaths ($\times 10^3$)	Proportion of all deaths
Preventive interventions		
Breastfeeding	1301	13%
Insecticide-treated materials	691	7%
Complementary feeding	587	6%
Zinc	459 (351)*	5% (4%)*
Clean delivery	411	4%
Hib vaccine	403	4%
Water, sanitation, hygiene	326	3%
Antenatal steroids	264	3%
Newborn temperature management	227 (0)*	2% (0%)*
Vitamin A	225 (176)*	2% (2%)*
Tetanus toxoid	161	2%
Nevirapine and replacement feeding	150	2%
Antibiotics for premature rupture of membranes	133 (0)*	1% (0%)*
Measles vaccine	103	1%
Antimalarial intermittent preventive treatment in pregnancy	22	<1%
Treatment interventions		
Oral rehydration therapy	1477	15%
Antibiotics for sepsis	583	6%
Antibiotics for pneumonia	577	6%
Antimalarials	467	5%
Zinc	394	4%
Newborn resuscitation	359 (0)*	4% (0%)*
Antibiotics for dysentery	310	3%
Vitamin A	8	<1%

*Numbers represent effect if both levels 1 (sufficient) and 2 (limited) evidence are included, value number in brackets shows effect if only level-1 evidence is accepted. Interventions for which only one value is cited are all classified as level 1.

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Special Feature

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COMPOSITION OF HUMAN MILK

The biological characteristics of human milk have been reviewed in detail elsewhere (13–15). Human milk is not a uniform body fluid but a secretion of the mammary gland of changing composition. Foremilk differs from hindmilk, and colostrum is strikingly different from transitional and mature milk. Milk changes with time of day and during the course of lactation. Human milk consists not only of nutrients, such as proteins, lipids, carbohydrates, minerals, vitamins, and trace elements that are of paramount importance to fulfill the nutritional needs of young infants and ensure normal growth and development. Human milk also contains numerous immune-related components such as sIgA, leukocytes, oligosaccharides, lysozyme, lactoferrin, interferon-γ, nucleotides, cytokines, and others. Several

SUPPLEMENTATION OF BREAST-FED INFANTS

The vitamin D status of European women of child-bearing age and thereby the vitamin D content of breast milk is often inadequate because of the limited use of vitamin D supplemented cows' milk and dairy products, lack of sunshine, and ethnic tradition of covering of the body. Moreover, the risk of sunburn (short-term) and skin cancer (long-term) attributable to sunlight exposure makes it prudent to counsel against sun exposure and to support the use of sunscreen in infancy (24). Breast-fed infants should receive daily vitamin D supplementation regardless of maternal vitamin D status. The breast-fed infant has limited sources of vitamin K, usually present only in low concentrations in human milk. Generally, European paediatric societies recommend a vitamin K supplementation during the first weeks or months of life, either only to breast-fed infants or to all infants (86).

Vitamine nel Latte Materno

Contenuto medio di vitamine nel latte materno:

Vitamine liposolubili:

- Vitamina A: 450 mg/L
- Vitamina D: 22 UI/L
- Vitamina E: 3.2 mg □-TE/L
- Vitamina K: 9.2 ug/L

Vitamine idrosolubili:

- Acido folico: 85 ug/L
- Vitamina B12: 0.42 ug/L
- Vitamina B6: 0.13 mg/L
- Vitamina C: 40 mg/L

WHO/FAO 2004 – DRI 2008 – Revisione LARN 2012

VITAMINA D

Apporto adeguato 0-12 mesi[1]: 400 UI/die
(per mantenere 25-OH vitamina D ≥ 20 ng/ml)

Principale sorgente di vitamina D per l'uomo → esposizione alla luce solare

MA

Dose di esposizione solare adeguata per evitare il deficit di vitamina D in lattanti e bambini non e' nota

E

l'esposizione solare diretta va evitata prima dei 6 mesi di vita[2]

latte materno e colostro contengono scarse quantità di vitamina D

QUINDI

SUPPLEMENTAZIONE DI VITAMINA D E' NECESSARIA NEI NEONATI FIN DAI PRIMI GIORNI DI VITA

[1]IOM 2011, AAP 2008, Canadian Pediatric Association 2007, Endocrine Practice Guidelines Comiteee 2011

[1] AAP. Pediatrics 1999;104:328-33

Vitamina K neonatale

- Risorse limitate negli allattati al seno, da scarso trasporto placentare e da ridotta concentrazione nel latte materno (**0.1 – 0.2** µg/dL vs RDI **1** µg/kg/die), peraltro correlata ad assunzione dietetica

- Microflora intestinale (⇑⇑ bifidobatteri) incapace di sintetizzare vitamina K

Rischio di:

Vitamin K Deficiency Bleeding

Classica (0.25-1.7%): ***2 – 7 gg*** **(precoce <** ***24 h)***

emorragia cordone ombelicale, cutanea, nasale, intestinale o da circoncisione, rara emorragia endocranica

Tardiva (4.4-7.2/100000): ***2 – 12 settimane***

elevato rischio di emorragia endocranica

VITAMINA K

VKDB, in base all'età di insorgenza:

- **early VKDB** entro 24 ore dalla nascita, in neonati da madri che assumono farmaci che inibiscono vit K (antiTBC, anticonvulsivanti, alcuni antibiotici e antagonisti di vit K)

- **classical VKDB** 24 ore - 7 giorni di vita, associata a ritardata o insufficiente alimentazione

- **late VKDB** 2 - 12 settimane di vita, associata ad allattamento materno esclusivo

VKDB, in base all'eziologia:

- **VKDB idiopatica** in cui non sono identificabili altre cause oltre all'allattamento al seno esclusivo

- **VKDB secondaria** a farmaci materni, a colestasi o sindrome da malassorbimento, a deficit autosomico recessivo di fattori della coagulazione vit K-dipendenti

VITAMINA K

Fabbisogno

1-3 anni	30 µg/die
4-8 anni	55 µg/die
9-13 anni	60 µg/die
14-18 anni	75 µg/die

Carenza

- riduzione flora batteria
- deficit dell'assorbimento: inibito flusso di bile (ostruzione); colite
- alterata funzione epatica
- antagonisti (dicumarolo)
- malattia emorragica del neonato (latte materno con basso contenuto di vit K)

LC-PUFA: acidi grassi poliinsaturi a lunga catena

ACIDO ARACHIDONICO (AA, 20:4 n-6): dall'ACIDO LINOLEICO
ACIDO DOCOSOESAENOICO (DHA, 22:6 N-3): dall'AC. ALFA-LINOLENICO
ACIDO EICOSAPENTAENOICO (EPA, 20:5 N-3): dall'AC. ALFA-LINOLENICO

Negli allattati al seno i valori di LC-PUFA sono più alti degli allattati con formula non supplementata

La ricerca ha individuato questa differenza come responsabile delle migliori performance neuropsicologiche dei lattanti al seno, rispetto a quelli allattati al biberon (sviluppo cerebrale e retinico).

J. Perinat. Med. 36 (2008) 5–14 • Copyright © by Walter de Gruyter • Berlin • New York. DOI 10.1515/JPM.2008.001

Recommendations and guidelines for perinatal practice

The roles of long-chain polyunsaturated fatty acids in pregnancy, lactation and infancy: review of current knowledge and consensus recommendations*

Table 2 Recommended LC-PUFA supply with infant formula and baby foods.

1. The available evidence strongly supports benefits of adding DHA and AA to infant formula.
2. DHA should reach at least 0.2% of fatty acids and not exceed 0.5% of fatty acids.
3. Levels of added AA should at be least equal to those of added DHA.
4. The amount of EPA added should not exceed the amount of added DHA.

European Food Safety Authority

The EFSA Journal (2009) 941, 1-14

SCIENTIFIC OPINION

DHA and ARA and visual development

The following wording reflects the scientific evidence: "DHA contributes to the visual development of infants".

In order to bear the claim a formula should contain at least 0.3% of the total fatty acids as docosahexaenoic acid. Such amounts can be easily consumed as part of a balanced diet.

The target population is infants (formula-fed infants born at term from birth up to 12 months and breastfed infants after weaning up to 12 months).

Effetti a lungo termine della supplementazione esogena di LCPUFA sul quoziente intellettivo e sulle attività visive non sono state confermate per i neonati pretermine o a termine.

THE COCHRANE COLLABORATION®
2008

Longchain polyunsaturated fatty acid supplementation in infants born at term

Simmer K, Patole S, Rao SC

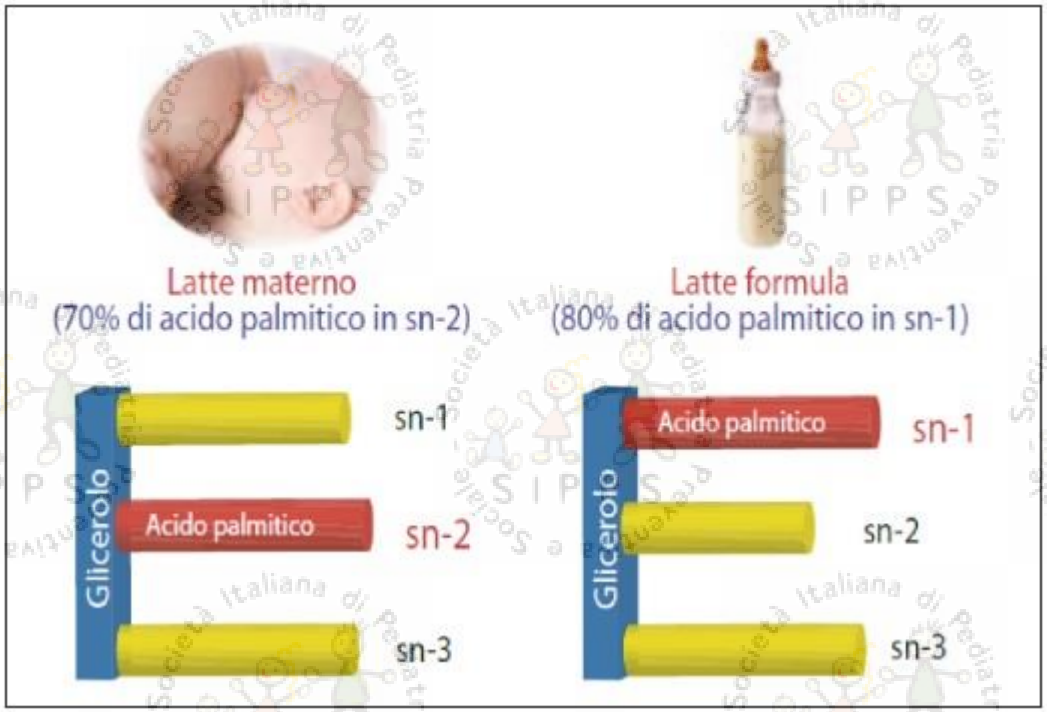
Longchain polyunsaturated fatty acid supplementation in preterm infants

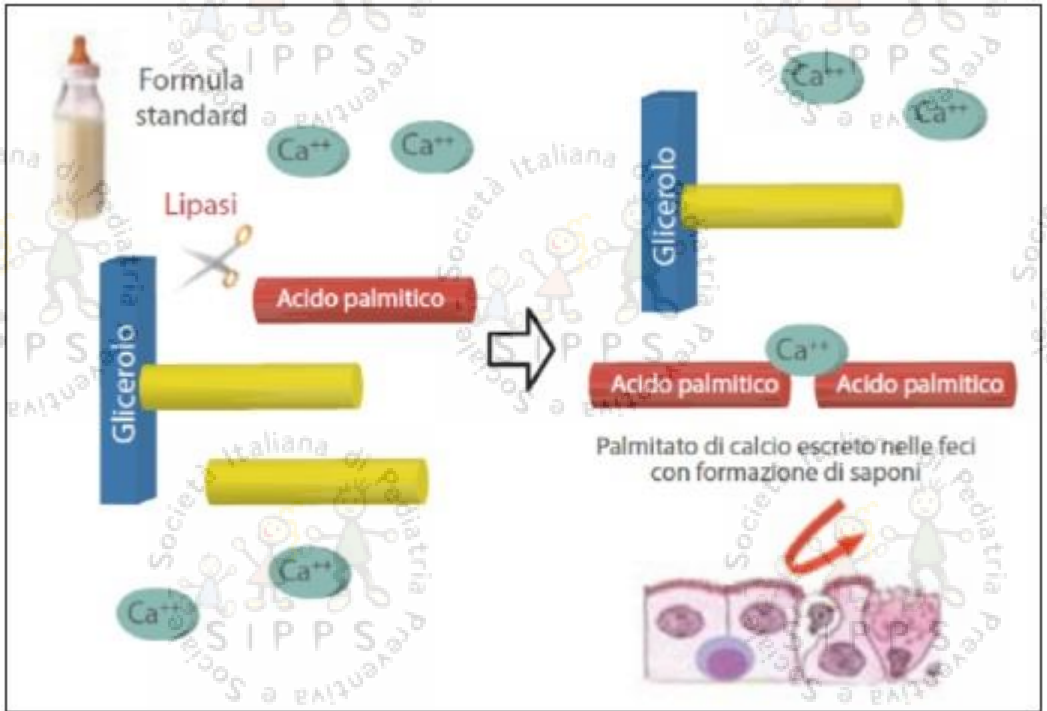
Schulzke SM, Patole SK, Simmer K

…tuttavia…

Trials with formulas providing close to the worldwide human milk mean of 0.32% DHA were more likely to yield functional benefits attributable to DHA. We agree with several expert groups in recommending that infants receive at least 0.3% DHA, with at least 0.3% ARA, in infant feedings; in addition, some clinical evidence suggests that an ARA:DHA ratio greater than 1:1 is associated with improved cognitive outcomes.

Hoffman DR, Boettcher JA, Diersen-Schade DA. Toward optimizing vision and cognition in term infants by dietary docosahexaenoic and arachidonic acid supplementation: a review of randomized controlled trials. *Prostaglandins Leukot Essent Fatty Acids. 2009 Aug-Sep;81(2-3):151-8.*


Latte materno
(70% di acido palmitico in sn-2)
Latte formula
(80% di acido palmitico in sn-1)
Glicerolo
sn-1
Acido palmitico
sn-2
sn-3
Glicerolo
Acido palmitico
sn-1
sn-2
sn-3


Formula
standard
Ca++
Ca++
Lipasi
Acido palmitico
Glicerolo
Ca++
Ca++
Glicerolo
Ca++
Ca++
Ca++
Acido palmitico
Acido palmitico
Palmitato di calcio escreto nelle feci
con formazione di saponi

NUCLEOTIDI

TABELLA 4: RCT CHE VALUTANO GLI EFFETTI DI FORMULE SUPPLEMENTATE CON NUCLEOTIDI SUGLI OUTCOME CONSIDERATI

Autori/Setting	Pazienti-intervento	Outcome	Risultati	Commenti
Schaller JP et al. 2004 (9) 18 Ospedali USA	477 bambini nati a termine (37-42 settimane), sani. PN > 2500 grammi, Apgar a 5 min ≥ 7, randomizzati in 3 gruppi: 1) CF=147 2) EF=138 3) BF=192 Vengono somministrate in doppio cieco le dosi dei vaccini anti-polio, anti-Hib, anti-difterite, anti-tetano	Risposta anticorpale ai vaccini Effetto sulla "morbilità", definita da crescita e numero di visite pediatriche per episodi infettivi Controlli a 2, 6, 7, 12 mesi	Risposta anticorpale anti-polio di tipo 1 significativamente più alta (p=0,04) nel gruppo EF vs il gruppo CF Nessuna differenza per gli anti-polio tipo 3, anti-Hib, anti-difterite, anti-tetano Non significative differenze relative a crescita e numero di visite pediatriche per episodi infettivi	Analisi secondo "intention to treat" tranne per poliovirus. Persi al follow-up: 20% per tutti i bambini arruolati Dati non analizzabili mediante tabella 2x2 Outcome surrogato Quantità di nucleotidi aggiunta quasi doppia rispetto a quantità massima raccomandata da ESPGHAN (9,6 vs 5 mg/100 kCal)
Tsou Yau KI et al. 2003 (4) 7 Ospedali Taiwan	336 bambini nati a termine (38-42 settimane), sani. PN > 2500 grammi, Apgar a 5 min ≥ 8, età 1-7 gg, randomizzati in 2 gruppi: 1) CF=170 2) EF=166 Vengono somministrate le 3 dosi del vaccino anti-epatite B (1-7 gg, 4-5 settimane, 24 settimane) Durata 48 settimane	Incidenza di diarrea nella fascia di età compresa fra 8 e 48 settimane Incidenza di infezioni respiratorie Valutazione della risposta sierologica al vaccino anti-epatite B e dei livelli sierici di immunoglobuline A, E, M	Nel gruppo EF incidenza di diarrea più bassa del 25,4% nella fascia d'età compresa fra 8 e 28 settimane di vita, del 14,2 % nella fascia 8-48 settimane, ma tali differenze non sono statisticamente significative (p=0,05 e 0,06 rispettivamente). Incidenza di infezioni respiratorie 1,13 volte più alto nel gruppo EF (p=0,02). Non differenze significative relative al titolo anticorpale anti-epatite B e ai valori sierici di IgM e IgE; valori sierici di IgA più alti nel gruppo EF ma con differenza non significativa (p=0,05)	Dati espressi in percentuali o in medie e non analizzabili in tabelle 2x2 Non definiti i persi al follow-up Non definito il tipo di analisi Quantità di nucleotidi aggiunta quasi doppia rispetto a quantità massima raccomandata da ESPGHAN (9,6 vs 5 mg/100 kCal)
Pickering LK et al. 1998 (10) 13 Ospedali USA	370 bambini nati a termine (38-42 settimane), sani, di 4-10 gg di vita. PN, LN e circonferenza cranica >5° percentile, randomizzati in 3 gruppi: - CF=125 - EF=121 - BF=124 Durata 12 mesi. Vengono somministrate le dosi dei vaccini anti-polio, anti-Hib, anti-difterite, anti-tetano	Risposta anticorpale ai vaccini al 6°, 7° e 12° mese di vita Parametri auxologici al 1°-2°-4°-6°-7°-12° mese	Il gruppo EF ha una concentrazione sierica significativamente più alta di anticorpi anti-Hib al 7° e al 12° mese rispetto al gruppo CF (p<0,01 e <0,005); al 6°-7°-12° mese (p<0,05) rispetto al gruppo BF; di anticorpi anti-difterite solo al 7° mese (p<0,05) rispetto agli altri 2 gruppi Nel gruppo BF la risposta anticorpale *antipolio* al 6° mese è significativamente maggiore rispetto agli altri due (p<0,05) Non significative differenze relative alle altre risposte anticorpali Non significative differenze relative ai parametri auxologici	Persi al follow-up: 16% Dati espressi in medie e non analizzabili in tabelle 2x2 Outcome surrogato Quantità di nucleotidi aggiunta quasi doppia rispetto a quantità massima raccomandata da ESPGHAN (9,6 vs 5 mg/100 kCal)

CF=formula standard di controllo – EF=formula sperimentale supplementata con 72 mg/l di nucleotidi (pari a 9,6 mg/100 kCal) – BF=allattati esclusivamente al seno per 2 mesi, successivamente alcuni integrano o sostituiscono il latte materno con formula non supplementata con nucleotidi.

Di Tommaso et al, Quaderni ACP 2006

NUCLEOTIDI

- Risposta anticorpale al vaccino anti-polio 1 significativamente più alta (p=0,04)
- Incidenza di diarrea più bassa del 25,4% nella fascia d'età compresa fra 8 e 28 settimane di vita, del 14,2 % nella fascia 8-48 settimane
- Concentrazione sierica significativamente più alta di anticorpi in risposta alla vaccinazione:
  - anti-Hib al 7° e al 12° mese (p<0,01 e <0,005); al 6°-7°-12° mese (p<0,05)
  - anti-difterite solo al 7° mese (p<0,05)

Di Tommaso et al, Quaderni ACP 2006

PROBIOTICI E PREBIOTICI

RAZIONALE

MEDICO E BAMBINO

CASI INDIMENTICABILI
in Pediatria Ambulatoriale

G.T.

Esattamente cinquant'anni fa, nel 1952, ero un medico giovanissimo, appena laureato … … Curavo una piccola bambina di pochi mesi per una grave forma di gastroenterite. Il ricovero era impossibile, sia per le distanza che per le condizioni familiari, famiglia numerosa poverissima … … Questo tipo di malattia allora era molto frequente, veniva etichettata come dispepsia (!!!) … … Colpiva più o meno tutti i bambini, soprattutto poveri, appena si iniziava lo svezzamento con latte vaccino e pane bollito (!!!). Se il piccolo non moriva, spesso la patologia cronicizzava, portando la cosiddetta distrofia (da farine o da proteine)… … La terapia era latte di asina, da dare crudo …… (già si capiva che l'intolleranza al latte doveva essere la causa o la concausa principale di quelle patologie). In farmacia si poteva acquistare anche il latticello acido in polvere … …

NOTA: A QUEI TEMPI I LATTIACIDIFICATI IN COMMERCIO ERANO DUE P…….. E P ……..

PROBIOTICI E PREBIOTICI

Tabella II Conclusioni e raccomandazioni dell'ESPGHAN su probiotici e prebiotici

- Dati ancora limitati sulla sicurezza e gli effetti, soprattutto a lungo termine, di probiotici aggiunti a formule di inizio, di seguito e prodotti dietetici per l'infanzia (alcuni dati suggeriscono un beneficio a breve termine di alcuni ceppi probiotici in lattanti e bambini piccoli con diarrea infettiva).
- Usare solo ceppi batterici con dimostrata identità e stabilità genetica attraverso metodiche culturali e molecolari.
- Formule di inizio addizionate con **probiotici** commercializzate solo dopo attenta valutazione di benefici e sicurezza. Minori controlli per le formule di seguito, perché il bambino è già stato esposto ai microrganismi ambientali e ha sviluppato un sistema di difesa.
- Si riconosce l'evidenza che alcune preparazioni a base di **probiotici** mostrano benefici relativamente a: gravità della diarrea, effetto preventivo su episodi diarroici, effetti preventivi a breve-medio termine su eczema atopico.I dati disponibili sull'utilizzo dei prebiotici nei prodotti per l'infanzia sono ancora limitati. Non si possono quindi ancora formulare raccomandazioni generali sull'uso di molecole **prebiotiche** a scopo preventivo e terapeutico nel corso dell'infanzia.
- In corso di somministrazione alcuni **prebiotici** possono aumentare il numero totale di bifidobatteri nelle feci e renderle più "morbide".
- Non vi è documentazione di effetti negativi delle miscele di oligosaccaridi utilizzate nei prodotti dietetici per l'infanzia.
- Studi futuri dovrebbero definire tipi e dosaggi di oligosaccaridi con presunta attività **prebiotica**, i dosaggi ottimali e la durata di assunzione, gli aspetti relativi alla sicurezza di assunzione e i potenziali effetti a breve e lungo termine.

Agostoni et al, Area Pediatrica 2008

Review

Trends in Microbiology, April 2013, Vol. 21, No. 4

Human Microbiome

Development of intestinal microbiota in infants and its impact on health

Sebastien Matamoros[1], Christele Gras-Leguen[2*], Françoise Le Vacon[3], Gilles Potel[2,†], and Marie-France de La Cochetiere[4]

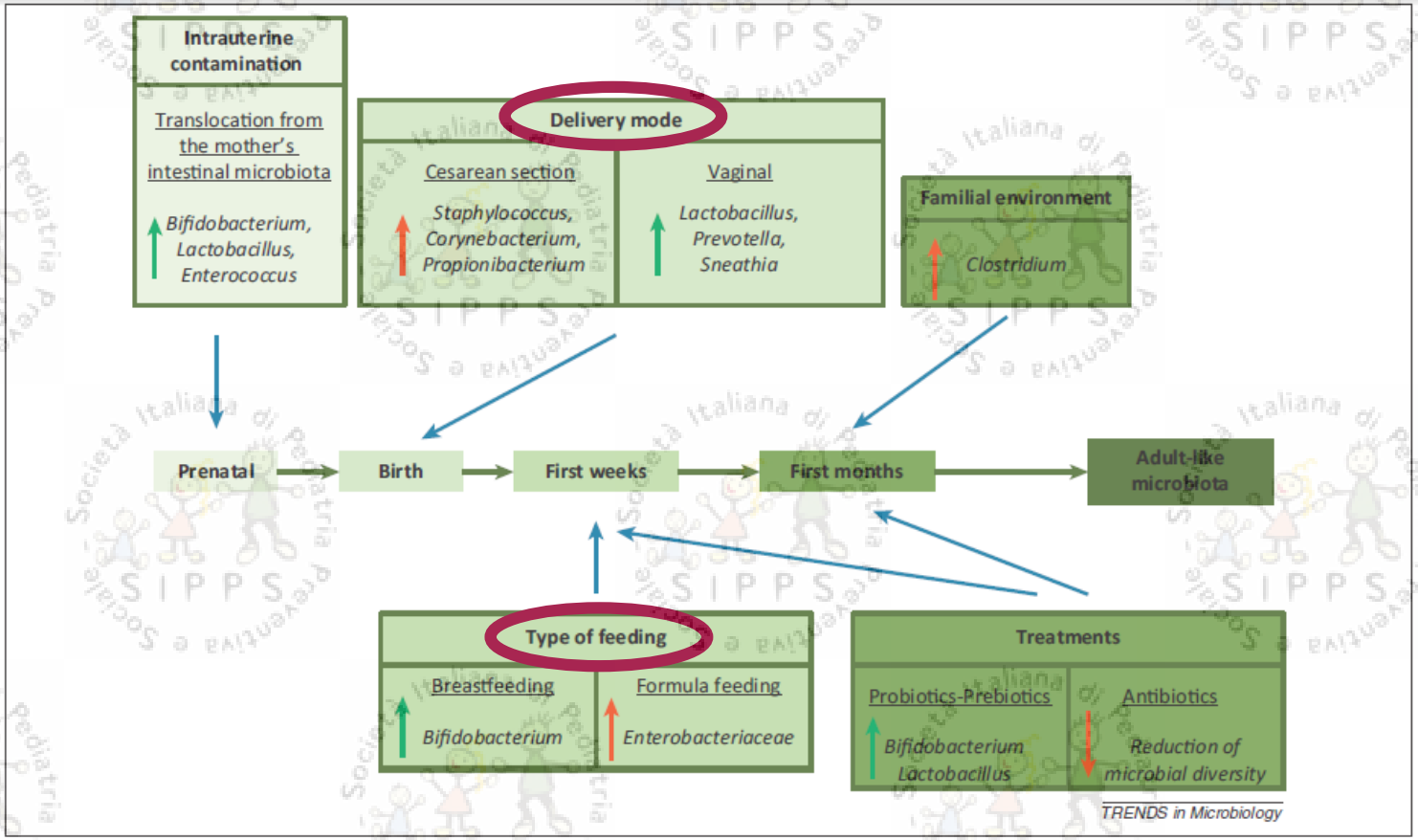
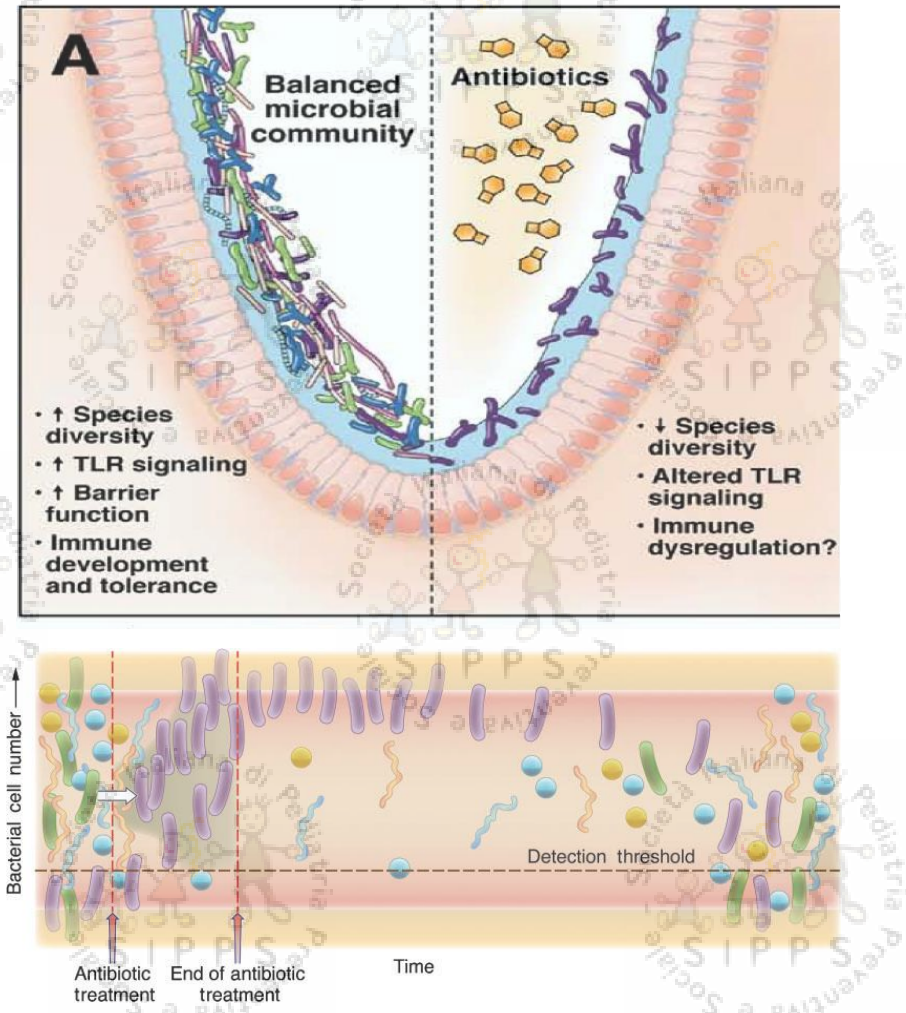


Figure 1. Impact of external factors on the intestinal microbiota of the infant. Green arrows show beneficial modification; red arrows show modification considered negative for healthy development.

ANTIBIOTICI E MICROBIOTA

LE TERAPIE ANTIBIOTICHE, SOPRATTUTTO SE AD AMPIO SPETTRO E PROLUNGATE, DETERMINANO ALTERAZIONE DELLA NORMALE FLORA MICROBICA INTESTINALE, CREANDO UN «VUOTO ECOLOGICO»



FUNZIONI DEL MICROBIOTA

Original Investigation

Prophylactic Use of a Probiotic in the Prevention of Colic, Regurgitation, and Functional Constipation
A Randomized Clinical Trial

Flavia Indrio, MD; Antonio Di Mauro, MD; Giuseppe Riezzo, MD; Elisa Civardi, MD; Cristina Intini, MD; Luigi Corvaglia, MD; Elisa Ballardini, MD; Massimo Bisceglia, MD; Mauro Cinquetti, MD; Emanuela Brazzoduro, MD; Antonio Del Vecchio, MD; Silvio Tafuri, MD, PhD; Ruggiero Francavilla, MD, PhD

JAMA 2014

Table 2. Primary Outcome at 1 Month of Life

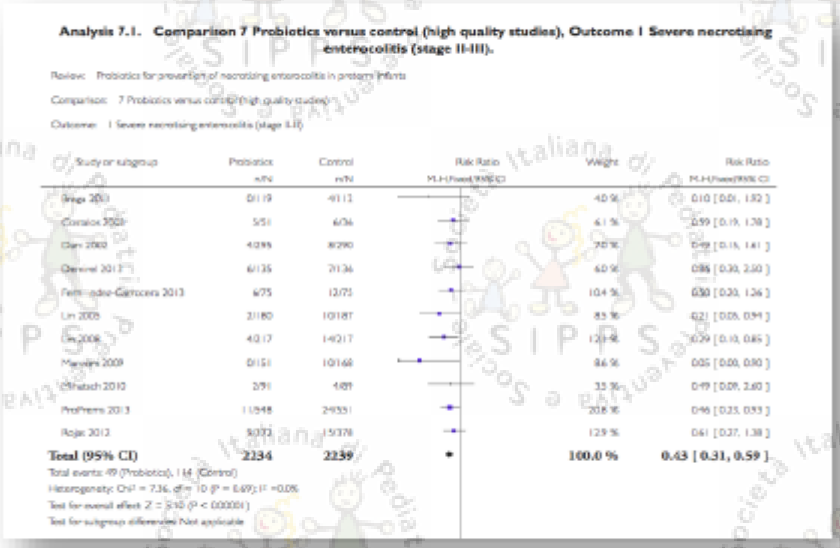
Characteristic	Mean (SD) [95% CI]		*P* Value
	Lactobacillus reuteri DSM 17938	Placebo	
Colic, min/d	45 (12) [43.5-46.5]	96 (34) [91.6-100.4]	<.01
Regurgitation, No./d	2.7 (1.5) [2.5-2.9]	3.3 (2.3) [3.0-3.6]	.35
Evacuation, No./d	4.01 (1.1) [3.9-4.1]	2.8 (0.6) [2.7-2.9]	<.01

Table 3. Primary Outcome at 3 Months of Life

Characteristic	Mean (SD) [95% CI]		*P* Value
	Lactobacillus reuteri DSM 17938	Placebo	
Colic, min/d	37.7 (33.8) [33.4-42.0]	70.9 (51.9) [64.2-77.6]	<.01
Regurgitation, No./d	2.9 (1.1) [2.7-3.0]	4.6 (3.2) [4.2-5.0]	
Evacuation, No./d	4.2 (1.8) [4.0-4.4]	3.6 (1.8) [3.4-3.8]	

FUNZIONI DEL MICROBIOTA

24 RCT che arruolavano neonati pretermine (E.G.< 37 settimane o di peso alla nascita < 2500 g) dal 1966 ad ottobre 2013.



Analysis 7.1. Comparison 7 Probiotics versus control (high quality studies), Outcome 1 Severe necrotising enterocolitis (stage II-III).

Review: Probiotics for prevention of necrotising enterocolitis in preterm infants

Comparison: 7 Probiotics versus control (high quality studies)

Outcome: 1 Severe necrotising enterocolitis (stage II-III)

Study or subgroup	Probiotics n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Weight	Risk Ratio M-H,Fixed,95% CI
Bin-Nabha 2014	0/119	4/113		4.0 %	0.10 [0.01, 1.82]
Costalos 2003	5/51	6/36		6.1 %	0.59 [0.19, 1.78]
Dani 2009	4/295	8/290		7.0 %	0.49 [0.15, 1.61]
Dilmen 2011	6/135	2/136		6.0 %	3.03 [0.63, 14.60]
Fernández-Carrocera 2013	6/75	12/72		10.4 %	0.48 [0.20, 1.16]
Lin 2005	2/180	10/187		8.5 %	0.21 [0.05, 0.94]
Lin 2008	4/217	14/217		12.9 %	0.29 [0.10, 0.85]
Manzoni 2009	0/151	10/168		8.6 %	0.05 [0.00, 0.90]
Mohan 2010	2/91	1/89		3.3 %	1.95 [0.09, 42.00]
ProPrems 2013	11/948	24/951		20.8 %	0.46 [0.23, 0.93]
Rojas 2012	9/373	15/378		12.9 %	0.61 [0.27, 1.38]
Total (95% CI)	**2134**	**2239**		**100.0 %**	**0.43 [0.31, 0.59]**

Total events: 49 (Probiotics), 116 (Control)

Heterogeneity: Chi² = 7.36, df = 10 (P = 0.69); I² = 0.0%

Test for overall effect: Z = 5.10 (P < 0.00001)

Test for subgroup differences: Not applicable

THE COCHRANE COLLABORATION®

La supplementazione enterale di Probiotici previene lo sviluppo di NEC severa nei neonati pretermine.

PROBIOTICI AGGIUNTI AI LATTI FORMULATI

ACCRESCIMENTO (B lactis, B bifidum + S thermophylus +L helveticus, B longum BL999 e L rhamnosus LPR, LGG, L Reuteri ATCC 55730)

OK

INFEZIONI GASTROINTESTINALI (B lactis, , B longum BL999 e L rhamnosus LPR)
SINTOMI RESPIRATORI (B lactis)
USO DI ANTIBIOTICI (B longum BL999 e L rhamnosus LPR)
COLICHE, PIANTO, IRRITABILITÀ (B lactis, B longum BL999 e L rhamnosus LPR, L Reuteri ATCC 55730, LGG)
ALLERGIA (B longum BL999 e L rhamnosus LPR)
FREQUENZA DELL'EVACUAZIONE (LGG, (B lactis, , B longum BL999 e L rhamnosus LPR)
CONSISTENZA DELLE FECI (LGG, B lactis, B longum BL999 e L rhamnosus LPR, L Reuteri ATCC 55730, LGG)

Nessuna modifica significativa

Dati disponibili ancora insufficienti a trarre conclusioni definitive

Supplementation of Infant Formula With Probiotics and/or Prebiotics: A Systematic Review and Comment by the ESPGHAN Committee on Nutrition

*ESPGHAN Committee on Nutrition: [*]Christian Braegger, [*3]Anna Chmielewska, [†]Tamas Decsi, [‡]Sanja Kolacek, [‡‡]Walter Mihatsch, [§]Luis Moreno, [*3]Małgorzata Pieścik, [‖]John Puntis, [¶1]Raanan Shamir, [#]Hania Szajewska, [**2]Dominique Turck, and [††]Johannes van Goudoever*

(*JPGN* 2011;52: 238–250)

The administration of a few probiotics (single or in combination) supplemented to infant or follow-on formulae and given beyond early infancy may be associated with some clinical benefits, such as a reduction in the risk of nonspecific gastrointestinal infections, a reduced risk of antibiotic use, and a lower frequency of colic and/or irritability. However, the available studies varied in methodological quality, the specific probiotics studied, the durations of the interventions, and the doses used. The Committee considers there is still too much uncertainty to draw reliable conclusions from the available data. The safety and clinical effects of 1 probiotic microorganism should not be extrapolated to other probiotic microorganisms.

PEDIATRICS
OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

Effect of a Probiotic Infant Formula on Infections in Child Care Centers: Comparison of Two Probiotic Agents

Zvi Weizman, Ghaleb Asli and Ahmed Alsheikh

Pediatrics 2005;115;5
DOI: 10.1542/peds.2004-1815

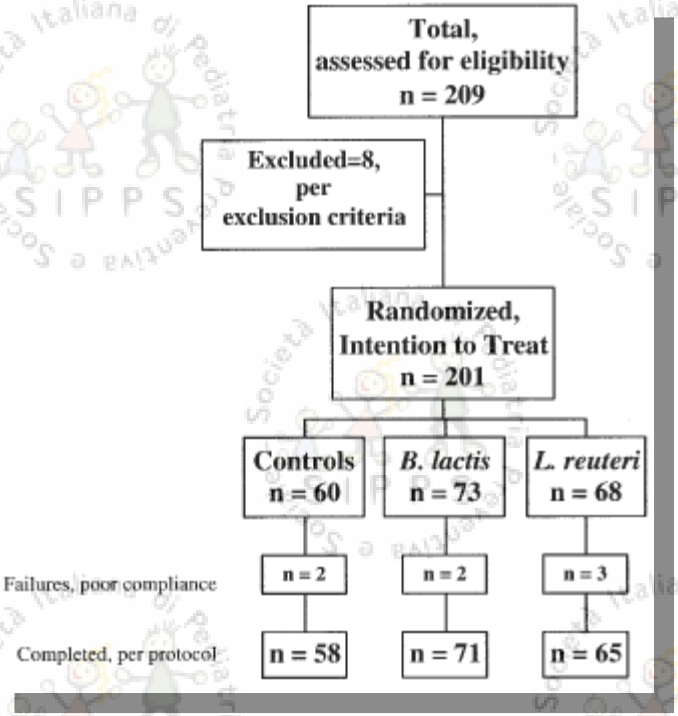


TABLE 2. Morbidity Parameters of the 3 Groups

Parameter	Controls	BB-12	*L reuteri*	*P* Value
n	60	73	68	
Days with fever	0.83 (0.50–1.16)	0.86 (0.33–1.39)	0.17 (0.04–0.30)	<.001*
Episodes of fever	0.41 (0.28–0.54)	0.27 (0.17–0.37)	0.11 (0.04–0.18)	<.001†
Days with diarrhea	0.59 (0.34–0.84)	0.37 (0.08–0.66)	0.15 (0.12–0.18)	<.001†
Episodes of diarrhea	0.31 (0.22–0.40)	0.13 (0.05–0.21)	0.02 (0.01–0.05)	<.001†
Days with respiratory illness	0.60 (0.31–0.89)	0.68 (0.17–1.19)	0.38 (0.10–0.66)	.169
Respiratory illness episodes	0.24 (0.13–0.35)	0.25 (0.15–0.35)	0.17 (0.08–0.26)	.457
Clinic visits	0.55 (0.42–0.68)	0.51 (0.34–0.68)	0.23 (0.12–0.34)	.002*
Absences from child care	0.43 (0.22–0.64)	0.41 (0.19–0.63)	0.14 (0.07–0.35)	.015*
Prescriptions of antibiotics	0.19 (0.09–0.29)	0.21 (0.12–0.30)	0.06 (0.01–0.12)	.037*

All data are means (95% confidence intervals).
* *L reuteri* versus BB-12 and controls.
† BB-12 and *L reuteri* versus controls.

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Pharmacological Research

journal homepage: www.elsevier.com/locate/yphrs

Lactobacillus fermentum CECT 5716 is safe and well tolerated in infants of 1–6 months of age: A Randomized Controlled Trial

Mercedes Gil-Campos[a], Miguel Ángel López[b], Mª Victoria Rodriguez-Benítez[a], Julio Romero[b], Inés Roncero[a], Mª Dolores Linares[b], Jose Maldonado[b], Eduardo López-Huertas[c], Regina Berwind[d], Kristin L. Ritzenthaler[d], Victor Navas[e], Carlos Sierra[e], Lluis Sempere[f], Arjan Geerlings[f], Jose A. Maldonado-Lobón[f], Antonio D. Valero[f], Federico Lara-Villoslada[g], Mónica Olivares[f,*]

this formula may improve the health of the infants by reducing the incidence of gastrointestinal infections.

Table 4
Incidence of infectious disease, febrile episodes and antibiotic treatment during the intervention period.

	Control group		Experimental group		Incidence rate ratio	IR decrease (%)	NNT	*p*-Value IRR
	No. events	Incidence rate (SE)	No. events	Incidence rate (SE)				
GI infections	17	0.283 (0.07)	5	0.082 (0.04)	0.289 (0.085–0.831)*	71.1	5	0.018
Respiratory infection	43	0.716 (0.11)	42	0.689 (0.11)	0.977 (0.623–1.530)	3.9	61	0.933
Total infections	63	1.050 (0.13)	49	0.803 (0.11)	0.778 (0.524–1.148)	23.5	4	0.339
Febrile episodes	13	0.220 (0.06)	13	0.213 (0.06)	0.967 (0.427–2.341)	3.3	–	–
Antibiotic treatments	7	0.115 (0.04)	8	0.131 (0.05)	1.105 (0.362–3.702)	−10.5	−61	0.807

*$p < 0.05$ versus control.

Human Milk Probiotic *Lactobacillus fermentum* CECT5716 Reduces the Incidence of Gastrointestinal and Upper Respiratory Tract Infections in Infants

*José Maldonado, †Francisco Cañabate, ‡Luis Sempere, †Francisco Vela, †Ana R. Sánchez, §Eduardo Narbona, ||Eduardo López-Huertas, ‡Arjan Geerlings, ‡Antonio D. Valero, ‡Mónica Olivares, and ¶Federico Lara-Villoslada

TABLE 3. Incidence of infectious disease, febrile episodes, and antibiotic treatment during the intervention period

	Control group, n = 91		Experimental group, n = 97				
	No. events	Incidence rate (SD)	No. events	Incidence rate (SD)	Incidence rate ratio (95% CI)	Incidence rate decrease, %	*P*
Gastrointestinal infections	33	0.363 (0.53)	19	0.196 (0.51)*	0.54 (0.31–0.95)	46	0.032
Respiratory infection	134	1.470 (1.31)	106	1.093 (1.00)*	0.74 (0.58–0.96)	26	0.022
Upper respiratory	121	1.330 (1.23)	94	0.969 (0.96)*	0.73 (0.56–0.95)	27	0.021
Lower respiratory	13	0.143 (0.35)	12	0.124 (0.33)	0.87 (0,40–1.90)	13	0.719
Otitis	12	0.132 (0.34)	7	0.072 (0.26)	0.55 (0.22–1.32)	45	0.177
Urinary tract infections	5	0.055 (0.22)	1	0.010 (0.10)	0.19 (0.02–1.56)	81	0.083
Other infections*	5	0.055 (0.22)	9	0.093 (0.29)	1.69 (0.50–1.85)	−69	0.326
Total infections	189	2.08 (1.59)	142	1.46 (1.16)*	0.70 (0.57–0.88)	30	0.002
Febrile episodes	78	0.857 (0.90)	67	0.690 (0.88)	0.81 (0.68–0.94)	19	0.203
Antibiotic treatments	57	0.626 (0.90)	52	0.536 (0.70)	0.86 (0.59–1.24)	14	0.445

CI = confidence interval; SD = standard deviation.
* Other infections include chickenpox, Epstein-Barr virus, herpesvirus, oral candidiasis, conjunctivitis, and febrile episodes of unknown origin.

Pediatr Res. 2016 Dec 21. doi: 10.1038/pr.2016.270. [Epub ahead of print]

Starter formula enriched in prebiotics and probiotics ensures normal growth of infants and promotes gut health: a randomized clinical trial.

Radke M[1], Picaud JC[2], Loui A[3], Cambonie G[4], Faas D[5], Lafeber HN[6], de Groot N[7], Pecquet SS[7], Steenhout PG[8], Hascoet JM[9].

Author information

Abstract

BACKGROUND: Prebiotics and probiotics exert beneficial effects by modulating gut microbiota and immune system. This study evaluates efficacy and safety of an infant formula containing Bovine Milk-derived Oligosaccharides (BMOS) and B. lactis (CNCM I-3446) on incidence of diarrhea and febrile infections during the first year of life (primary outcome).

METHODS: Full-term infants receiving Test or Control (without BMOS and B. lactis) formula were enrolled in a multi-center, randomized, controlled, double-blind trial with a reference breastfeeding group.

RESULTS: 413 infants were assigned between Test (n=206) and Control (n=207) formula. There was no significant difference for diarrhea and febrile infections incidence between groups at 6 (OR [95% CI] = 0.56 [0.26-1.15], p=0.096) and 12 months (OR=0.66 [0.38-1.14], p=0.119). Test formula was well tolerated, anthropometrics parameters were not significantly different between groups and aligned with WHO growth standards up to 12 months. Data from test group showed that gut microbiota pattern, fecal IgA and stool pH were brought to be closer to those of breastfed infants.

CONCLUSIONS: An infant formula enriched with BMOS and B. lactis supports normal infant growth, is well tolerated and improves intestinal health markers. No differences in diarrhea and febrile infection incidence, were found in the population studied.Pediatric Research (2016); doi:10.1038/pr.2016.270.

Cow's milk and rice fermented with *Lactobacillus paracasei* CBA L74 prevent infectious diseases in children: A randomized controlled trial

Rita Nocerino [a], Lorella Paparo [a], Gianluca Terrin [b], Vincenza Pezzella [a], Antonio Amoroso [a], Linda Cosenza [a], Gaetano Cecere [a], Giulio De Marco [a], Maria Micillo [a], Fabio Albano [a], Rosa Nugnes [a], Pasqualina Ferri [a], Giuseppe Ciccarelli [a], Giuliana Giaccio [a], Raffaella Spadaro [a], Ylenia Maddalena [a], Francesco Berni Canani [c], Roberto Berni Canani [a, d, e, *]

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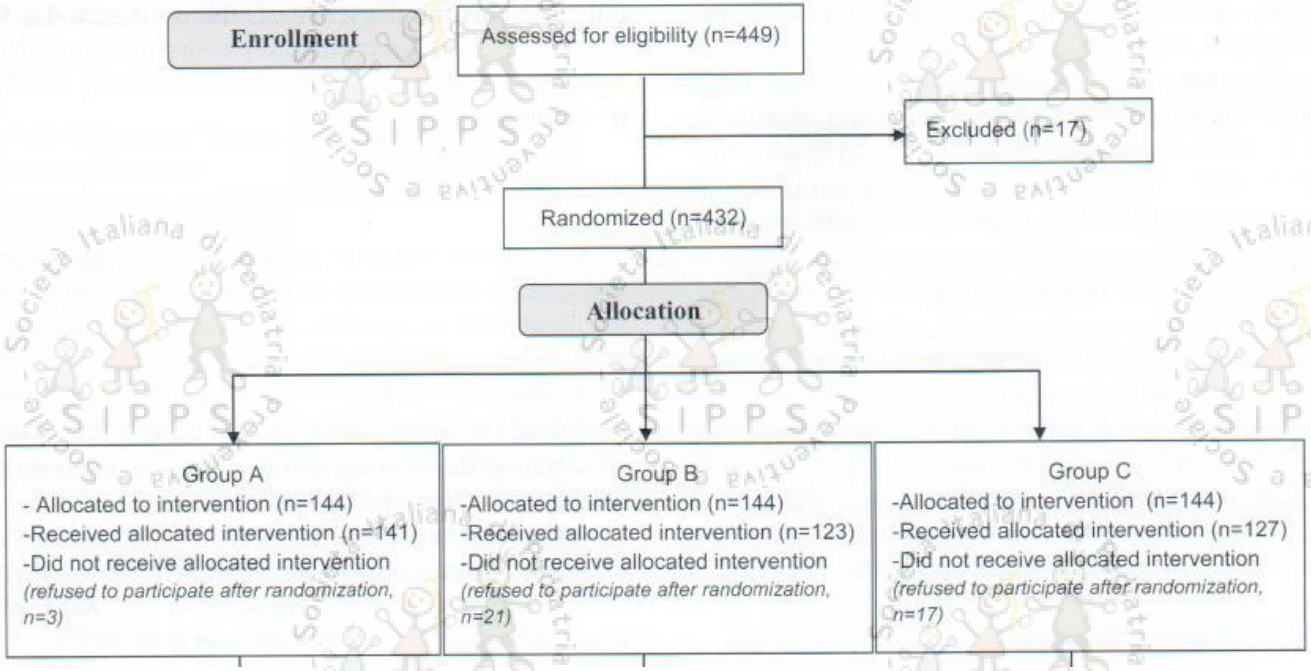
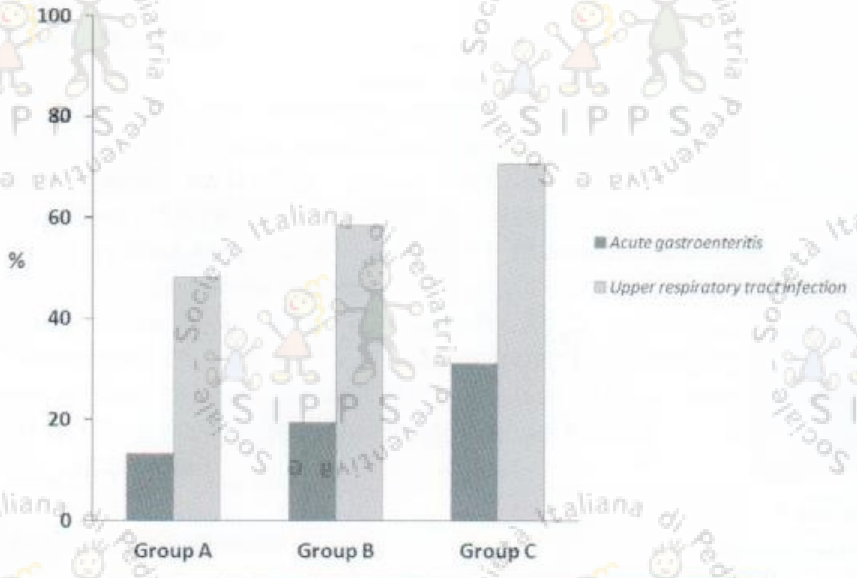


Latte fermentato **Riso fermentato** **Placebo**

Cow's milk and rice fermented with *Lactobacillus paracasei* CBA L74 prevent infectious diseases in children: A randomized controlled trial

Disease	Group A vs Group B *p*	Group A vs Group C *p*	Group B vs Group C *p*
CID, n (%)	0.022	<0.0001	0.010

Fig. 2. The rate of children presenting at least one common infectious disease (ITT analysis) during the study period.



Disease	Group A vs Group B *p*	Group A vs Group C *p*	Group B vs Group C *p*
Acute gastroenteritis, n (%)	0.169	<0.0001	0.038
Upper respiratory tract infection, n (%)	0.100	<0.0001	0.032

Fig. 3. The rate of children presenting at least one episode of acute gastroenteritis or at least one episode of upper respiratory tract infection (PP analysis) during the study period.

NON TUTTI I PROBIOTICI SONO UGUALI

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National survey outcomes on commercial probiotic food supplements in Italy

Paolo Aureli *, Alfonsina Fiore, Concetta Scalfaro, Maria Casale, Giovanna Franciosa

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ABSTRACT

To assess whether the probiotic food supplements, produced and distributed on the Italian market during 2005–2006, complied with the *Italian Guidelines on Prebiotics and Probiotics*, 72 samples from 29 processing plants were analyzed. The survey included 41 samples from processing plants and 31 samples of the same brand from retailers collected at timed intervals (3, 8 and 13 months).

A polyphasic approach based on a suitable analytical collection method (genotypic identification of total bacteria – differential presumptive enumeration – genotypic identification of viable bacteria) was adopted to identify and quantify the microorganisms labelled and recovered from the probiotic supplements examined. Most supplements analyzed (87%) did not conform to the Italian guidelines and the differences were both quantitative and qualitative (number determination, purity, types and viability of microorganisms). Even though most labelled supplements (25 samples) indicated the presence of *Bifidobacterium bifidum*, this organism was only detected sporadically and always as dead cells. Unexpected results were obtained during our survey due to the absence of viability of *Bacillus coagulans* spores in some labelled supplements. Besides this, some of these supplements also contained other spore-forming species, identified as *B. cereus* that are toxin producing. We have also documented a widespread use of misclassified microbial species or species with fictitious names. The main factors involved in the absence of compliance were examined and the poor quality control applied by manufacturers was emphasized.

La maggior parte dei prodotti analizzati (87%) non erano conformi alle linee guida italiane sia qualitativamente che quantitativamente (n. di colonie, purezza, tipo di batterio, etc.). Inoltre ben 25 prodotti che indicavano la presenza di bifidobatteri, spesso non lo contenevano o contenevano bacilli morti.

Si notava l'assenza di spore di Bacillus coagulans, anche se segnalate o erano presenti altri tipi di spore, quali quelle di Bacillus cereus che è produttore di tossine.

Si nota anche un grande uso di microbi non classificati o addirittura nomi fittizzi.

INVITED COMMENTARY

Probiotics: Fishing in the Ocean

Yvan Vandenplas and Gigi Veereman-Wauters

JPGN • Volume 54, Number 1, January 2012

Maldonado et al (1) report in this issue their work on *Lactobacillus fermentum* CECT5716. Literature on the topic of ''the role of the gastrointestinal flora in health and disease'' is exploding, but the increasing amount of data still fail to result in the expected high scientific evidence level for benefit. The European Society for Pediatric Gastroenterology, Hepatology, and Nutrition (ESPGHAN) Committee on Nutrition published in 2011: ''at present, there are insufficient data to recommend the routine use of probiotics and/or prebiotic-supplemented formulae'' (2). Nevertheless, it is virtually impossible to find formulae on the European market without pro- or prebiotics.

The use of probiotic microorganisms encompasses 2 major fields: prevention and treatment. Before probiotics can be prescribed as a treatment, the accumulated scientific evidence should be the same as for any medication. This means that phase I, II, and III clinical trials should have been performed and the data published. Carefully conducted randomized controlled prospective trials, with relevant inclusion/exclusion criteria and adequate sample sizes, are necessary.

Probiotics used in food are different. If for a drug, ''efficacy'' dominates to some extent ''safety,'' the opposite is true for food. When performing studies with food supplements, it is important to use the food product, as it will be or is commercialized, and not with probiotic capsules that were added to the food. For probiotics added to food, safety data are of major importance. There are reports of trials that had to be stopped because of the high incidence of GI adverse

In conclusion, the use of probiotics as food (supplement) or as drug are 2 different entities. Although for food, the demonstration of safety is a priority, for medication, the demonstration of efficacy is more relevant. To decrease the confusion, it may be preferable to rename microorganisms used as drugs differently. ''Biotherapeutic agent'' is an option.


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