



U.S. Dairy  
Export Council®

Ingredients | Products | Global Markets

# Role of Milk and Whey During the First 1,000 Days

---

**Dairy: An accelerator of economic growth?**

Focus on developing economies and emerging markets

Veronique Lagrange, Sr. Vice President  
US Dairy Export Council  
Zenith Conference, Amsterdam, June 26, 2015  
[vlagrange@usdec.org](mailto:vlagrange@usdec.org)

# Agenda



- Stunting and its cost to nations



- Low birth weight: a new focus



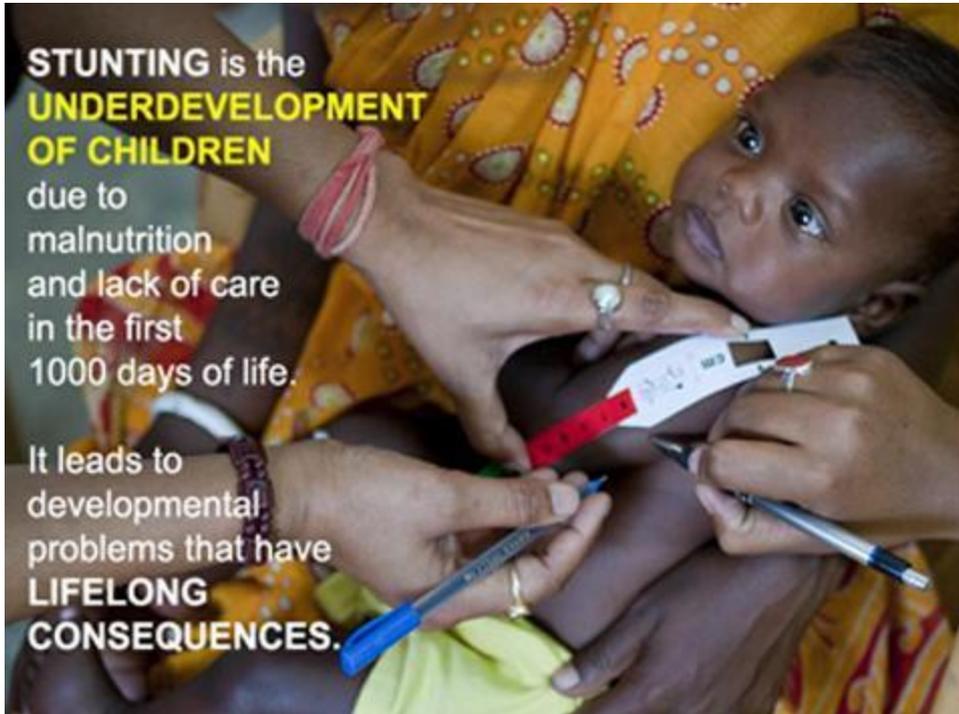
- Revisiting protein quality, needs, and nutrition innovation



U.S. Dairy  
Export Council.

Ingredients | Products | Global Markets

# What is stunting?



**Moderately Malnourished Children**  
195 million,  
**25% of children worldwide** affected by stunting

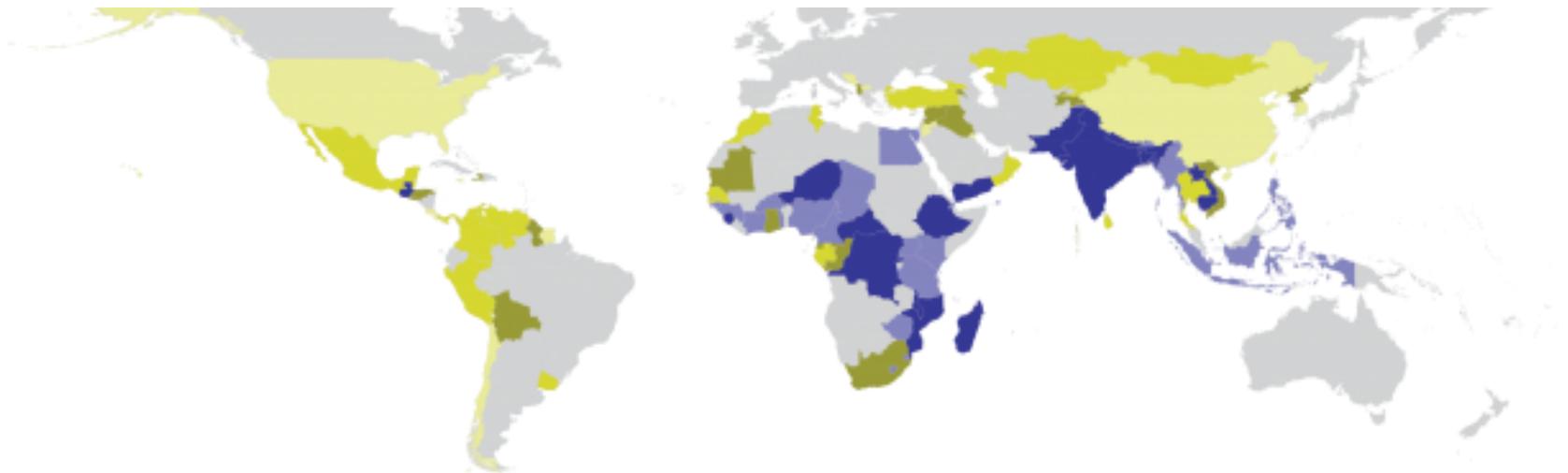


Photos: TOP 9-years old raised in Guatemala, BOTTOM same age group, Los Angeles



## Prevalence of stunting

- 40% of children in sub-Saharan Africa
- East and South Asia: 50% of children (estimates)



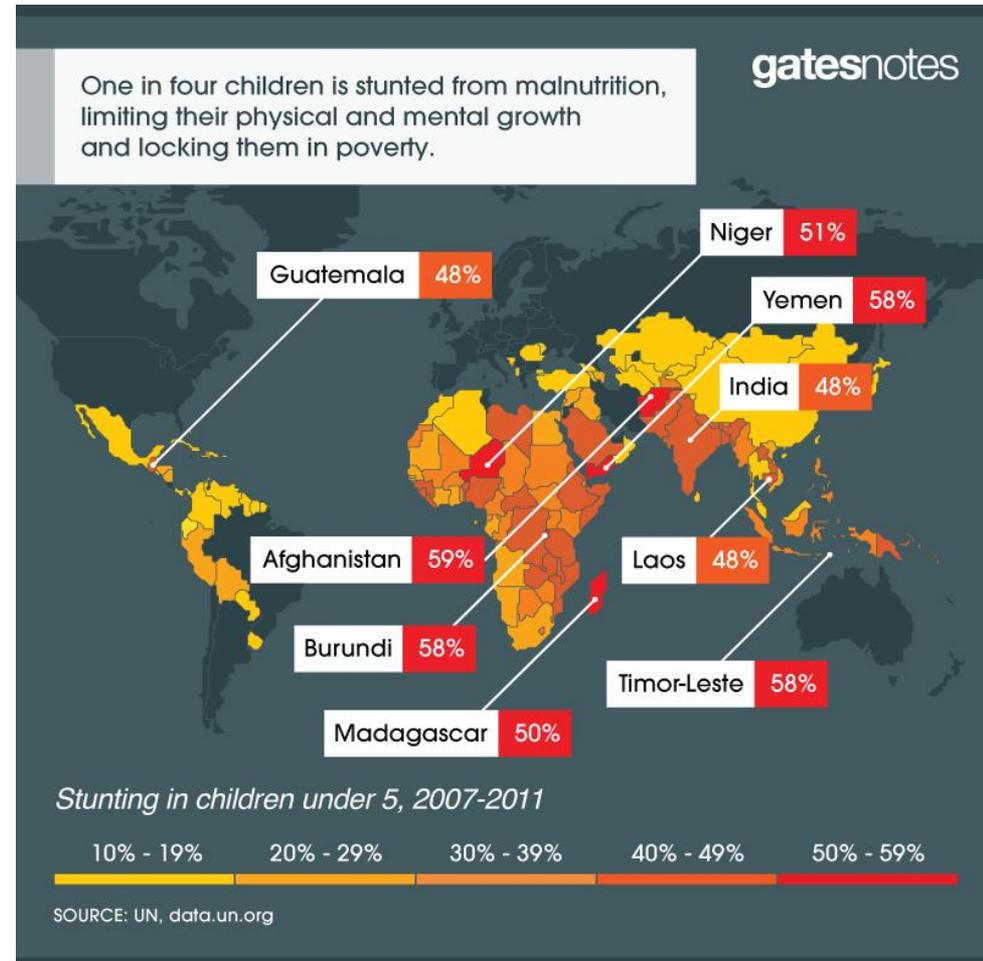
Level of public health significance	% of stunted under-fives
Low prevalence	Less than 10
Low prevalence	10-19
Medium prevalence	20-29
High prevalence	30-39
Very high prevalence	40 or more
	No available data



## Economic significance

Asia and Africa lose 11% of their GDP every year owing to poor nutrition

- Lower productivity
- Increase risk of chronic disease
- Obesity later in life





## And impact at the individual level

- Adults undernourished as children have a lower IQ
- They earn at least 20% less than those that were not





# Economic Rationale for Investing in Nutrition

- Demonstrated economic rationale for investing in stunting reduction:
- Benefit-cost ratio average: 18\*
- **Fit-for-purpose nutrition**, not just food is part of the solution

Source:

\*Hoddinott, J. Maternal & Child Nutrition, 2013 (9) Suppl. 2

The image shows a thumbnail of a journal article page. At the top, there is a header with a blue square on the left, the text 'Maternal & Child Nutrition' in the center, and 'Maternal & Child Nutrition' on the right. Below the header, the text 'Original Article' is centered. The main title of the article is 'The economic rationale for investing in stunting reduction'. Below the title, the authors are listed: 'John Hoddinott\*, Harold Alderman\*, Jere R. Behrman†, Lawrence Haddad‡ and Susan Horton§'. A small text block below the authors provides their affiliations: '\*Poverty, Health and Nutrition Division, International Food Policy Research Institute, Washington, DC, USA, †Departments of Economics and Sociology and Population Studies Center, University of Pennsylvania, Philadelphia, Pennsylvania, USA, ‡Institute of Development Studies, Brighton, UK, §Balsillie School of International Affairs, University of Waterloo, Ontario, Canada'. Below the authors, the word 'Abstract' is centered. At the bottom of the thumbnail, a short paragraph of the abstract is visible: 'This paper outlines the economic rationale for investments that reduce stunting. We present a framework that illustrates the functional consequences of stunting in the 1000 days after conception throughout the life cycle:'.



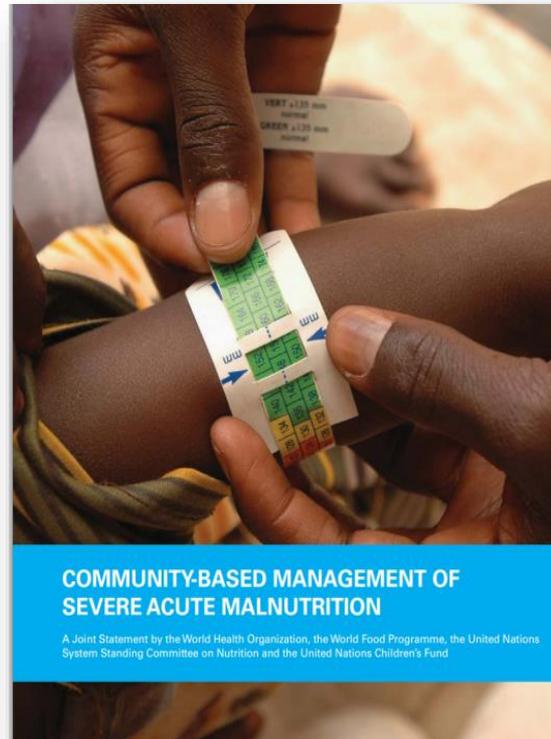
U.S. Dairy  
Export Council.

Ingredients | Products | Global Markets

# Dairy and severe malnutrition: strong evidence of efficacy, part of standard of care

To meet UNICEF specifications, RUTF needs to contain:

- >20-25% skim milk powder or,
- 30% WPC34, or
- 60% sweet whey (or a combination of those)



COMMUNITY-BASED MANAGEMENT OF SEVERE ACUTE MALNUTRITION

A Joint Statement by the World Health Organization, the World Food Programme, the United Nations System Standing Committee on Nutrition and the United Nations Children's Fund





# Moderate malnutrition: milk, whey recommended

Treatment of MAM is key  
to stunting prevention

Dairy ingredients are  
**recommended**, but  
not yet standard of  
care

Goal: Deliver dairy  
evidence,  
recommended dose to  
WHO for policy  
development





- Stunting and its cost to nations



- Low birth weight: a new focus



- Revisiting protein quality, needs, and nutrition innovation



## Children's nutrition is important, mothers' too

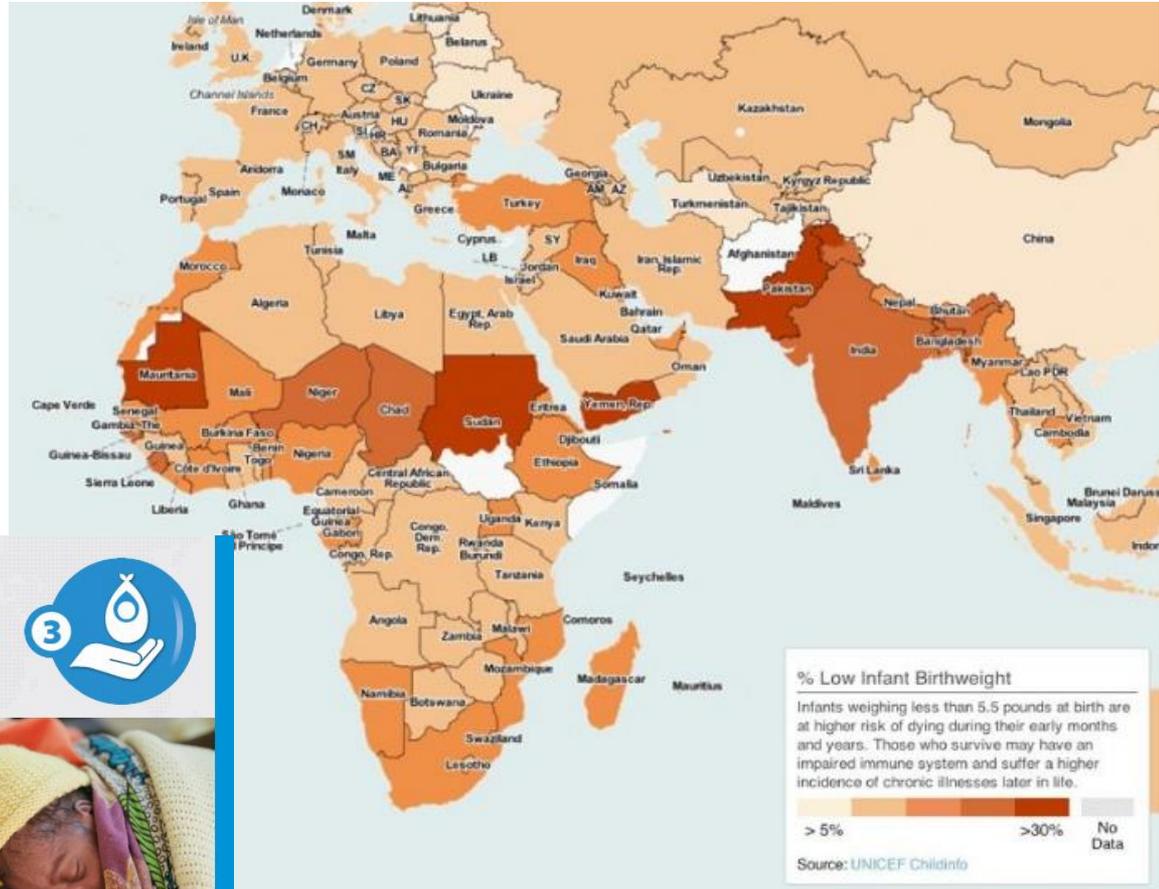
- 30% of stunting occurs in-utero
- Pregnant mothers have higher nutritional needs: proteins, calcium, vitamins – not just energy





# Low birth weight: a new United Nations focus

United Nations:  
new targets for  
pregnant women  
and their nutrition



Global Nutrition Targets 2025

**Low Birth Weight Policy Brief**



**TARGET:**

30% reduction in  
low birth weight



Graph courtesy: 1,000 Days Foundation



## Not a new concept...

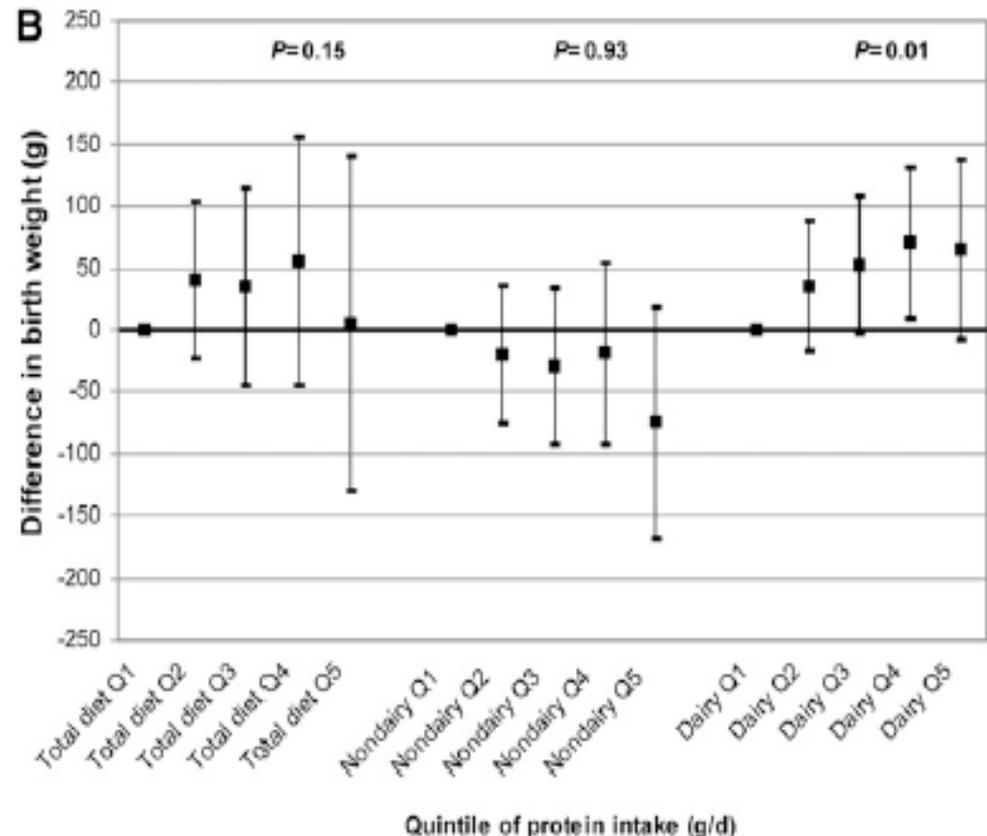
- But in developing countries, she will be pregnant or lactating for 18 years of her life...
- Can she afford these products over her lifetime?
- Are they even available?





# Emerging science adds evidence needed by policy makers

- Maternal cow's milk consumption (>3 glasses/day) was associated with greater fetal weight gain in 3<sup>rd</sup> trimester
- Maternal milk consumption not associated with length growth
- Protein intake from other non-dairy sources was not associated with birth weight increases.



## Potential for affordable, effective formula for women

- Supplements
- Fortification of everyday foods
- Need support by Governments, NGOs, and from UN agencies, other donors





- Stunting and its cost to nations



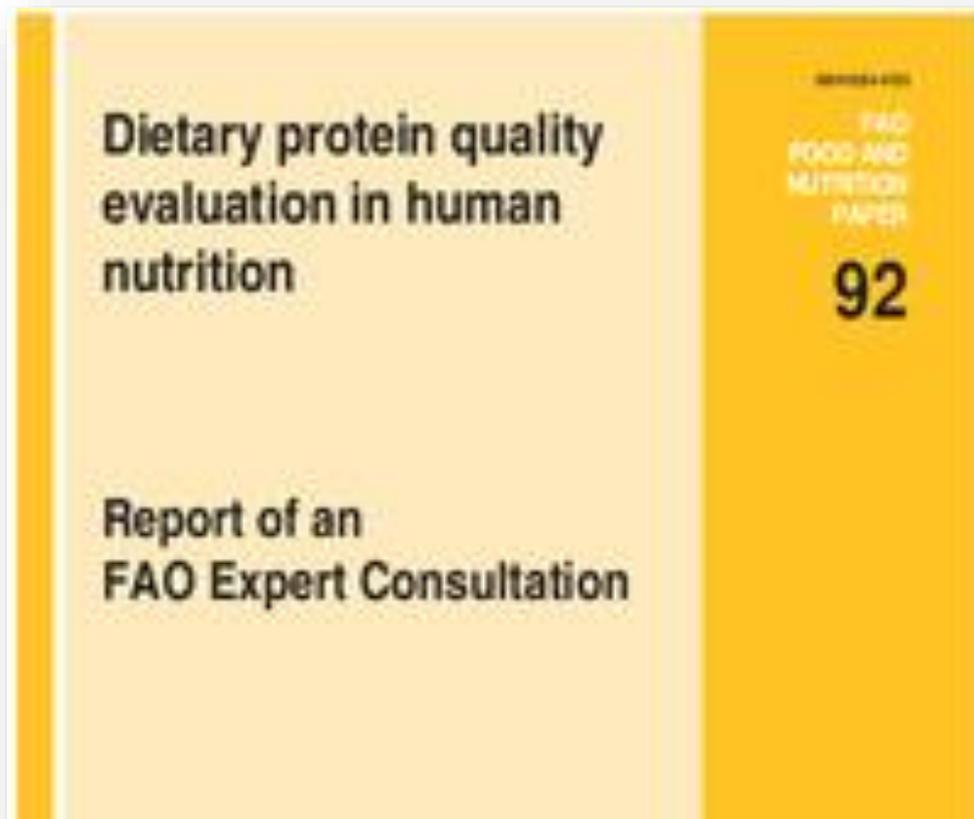
- Low birth weight: a new focus



- Revisiting protein quality, needs, and nutrition innovation

## Nutrition innovation in the 21<sup>st</sup> century

- Revisiting nutritional needs and protein quality





# New method to measure protein quality: DIAAS

## DIAAS and PDCAAS Differ

### DIAAS<sup>1</sup> versus PDCAAS for a range of protein sources

	WPI <sup>2</sup>	RPC <sup>3</sup>	MPC <sup>4</sup>	WPC <sup>5</sup>	SPI <sup>6</sup> A	SPI <sup>6</sup> B	PPC <sup>7</sup>	Pearl Barley
Threonine	1.66	0.93	1.44	2.32	1.20	1.04	1.18	0.77
MET/CYS	2.50	1.35	1.31	1.88	1.00	1.02	0.93	1.34
Valine	1.50	1.39	1.92	1.60	1.38	1.27	1.55	1.25
Isoleucine	2.55	1.34	2.09	2.70	1.83	1.59	1.88	1.01
Leucine	2.57	1.11	1.78	1.93	1.30	1.13	1.38	0.84
PHE/TYR	1.42	1.52	1.98	1.19	1.54	1.37	1.65	0.94
Histidine	1.25	1.18	1.81	1.10	1.55	1.34	1.52	1.08
Tryptophan	2.66	1.14	1.59	2.19	1.36	1.37	0.94	0.84
Lysine	2.47	0.38	1.75	2.01	1.15	0.98	1.49	0.58
DIAAS	1.25	0.38	1.31	1.10	1.00	0.98	0.93	0.58
PDCAAS	1.00	0.38	1.00	1.00	1.00	0.97	0.93	0.52*

<sup>1</sup>Based on true ileal AA digestibility and 2-5 yo AA requirement pattern (FAO, 2007)

\*NB a more poorly digested protein.

<sup>2</sup>Whey Protein Isolate; <sup>3</sup>Rice Protein Concentrate; <sup>4</sup>Milk Protein Concentrate; <sup>5</sup>Whey Protein Concentrate; <sup>6</sup>Soya Protein Isolate, <sup>7</sup>Pea Protein Concentrate





# Cost-effectiveness (MAM)

Fortified blended foods,  
complementary foods  
(LNS)

Perceived high cost of  
dairy ingredient a  
barrier...

Despite evidence on  
overall cost of treatment  
(moderate malnutrition)



## Possible impact on entire infant formula sector

- Allow to deliver formula closer to breast milk (lower protein than dairy)
- But with optimized amino-acid balance: more closely match plasma amino acid concentration in the infant





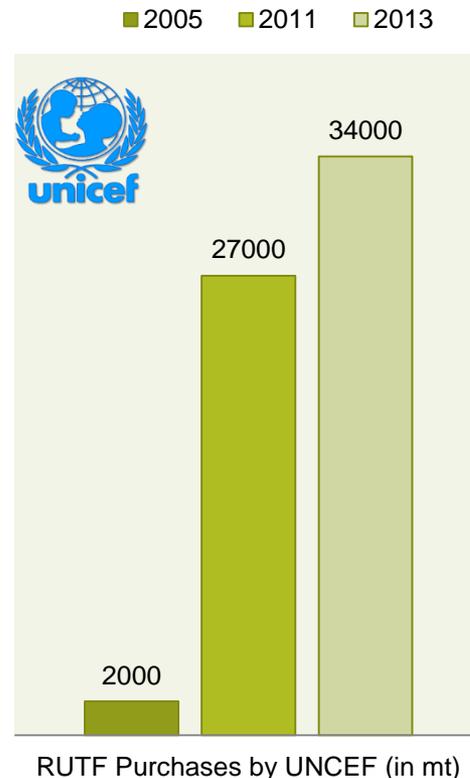
## The customers and market potential

In 2014, WFP purchased over \$75 million worth of specialized nutritious foods.

MSF, other NGOs and foundation purchase significant volumes + large future needs

Market potential for category could exceed 300,000 mt of dairy ingredients

UNICEF Purchases of RUTF (in mt)



## Revisiting protein and needs for 21<sup>st</sup> century

- Stunting: dairy is part of the solution
- Dairy ingredients: AA composition and utilization (DIAAS), Type II minerals, lactose support growth, lean body mass accretion
- 1,000 days nutrition: need adoption of new WHO policies supported by sound, pre-competitive science
- Large market potential in all developing economies for affordable, optimized products with good shelf-life under adverse conditions



U.S. Dairy  
Export Council.

Ingredients | Products | Global Markets

**Thank you!**

# *Dairy for Global Nutrition*



[www.dairyforglobalnutrition.org](http://www.dairyforglobalnutrition.org)

Veronique Lagrange, US Dairy Export Council, USA  
[vlagrange@usdec.org](mailto:vlagrange@usdec.org)