

Disclaimer

**The following slides are provided as a reference
exclusively to the
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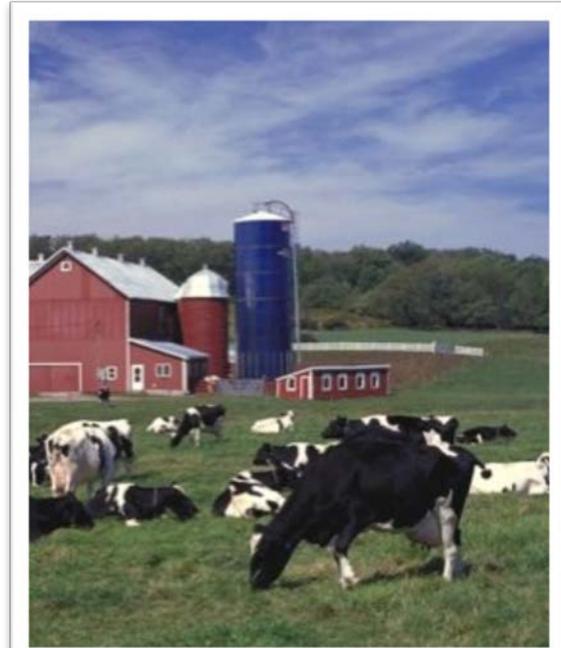
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Thank you for your cooperation.

Dairy as an Engine of Economic Growth

Dairy for Global Nutrition

- An initiative of the US Dairy Export Council
- We focus on funding research and projects to advance the science on the management of malnutrition, with a focus on stunting prevention
- Our work: support collaborative trials, communications, technical/R&D and supply chain

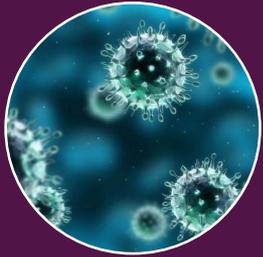


Dairy for Global Nutrition supports the International Code of Marketing of Breast-Milk Substitutes and other global nutritional principles set forth by the World Health Organization, the Codex Alimentarius, and UNICEF.

Breastmilk is the best source of nutrition for infants under 6 months. It is recommended that breastfeeding is continued along with appropriate complementary foods up to 2 years of age or beyond.



Major Pillars of Economic Development



Reduced
Morbidity



Physical
Growth



Cognitive
Development

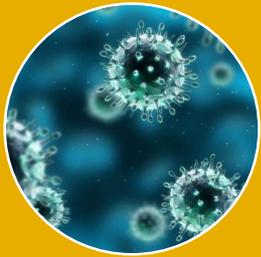


Reduced
Chronic
Diseases



Stunting and Economic Growth

All pillars of economic development affected



Reduced
Morbidity



Physical
Growth



Cognitive
Development

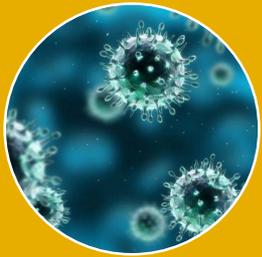


Reduced
Chronic
Diseases

Child stunting negatively affects
all these factors

Nutrition-specific Interventions: Direct Impact

In addition to nutrition-sensitive programs...



Reduced
Morbidity



Physical
Growth



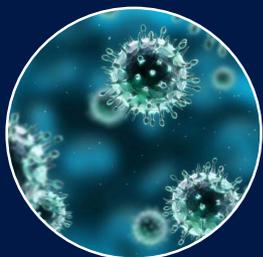
Stimulate
Cognitive
Development



Reduced
Chronic
Diseases

Nutrition-specific approaches can
make a difference

Dairy, Stunting Prevention and Economic Growth



Reduced
Morbidity



Physical
Growth



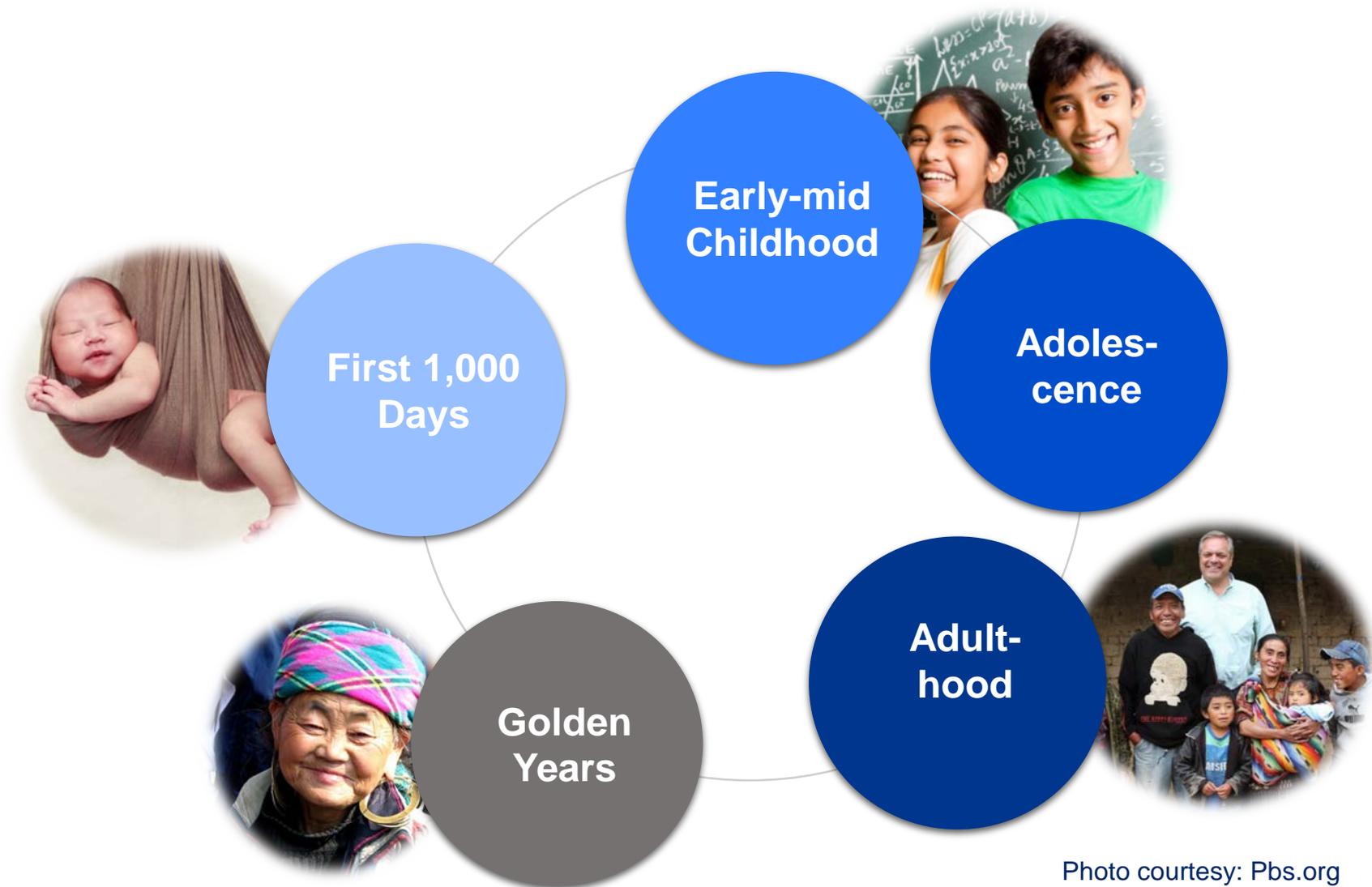
Stimulate
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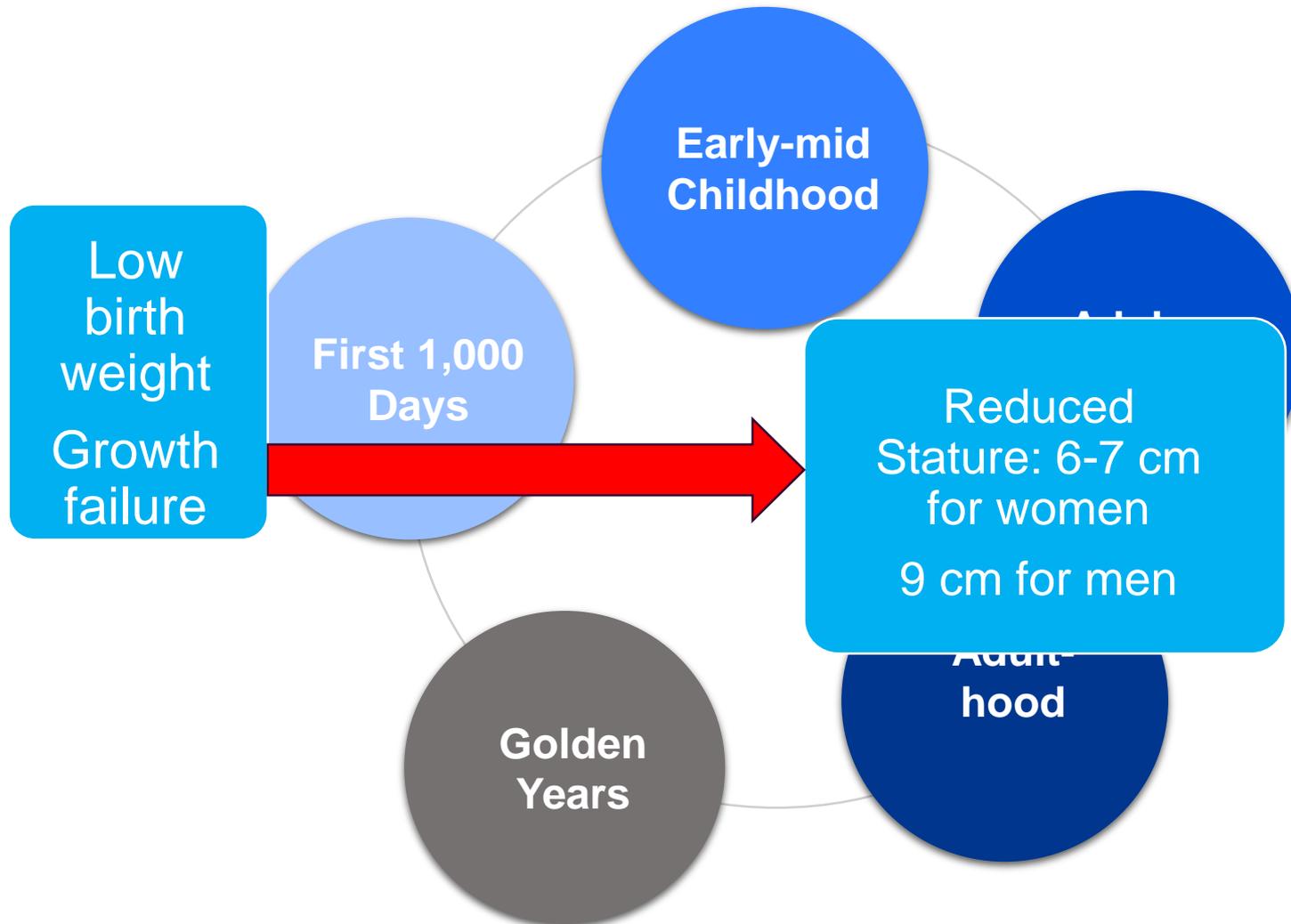
Reduced
Chronic
Diseases

What role do dairy nutrients play?

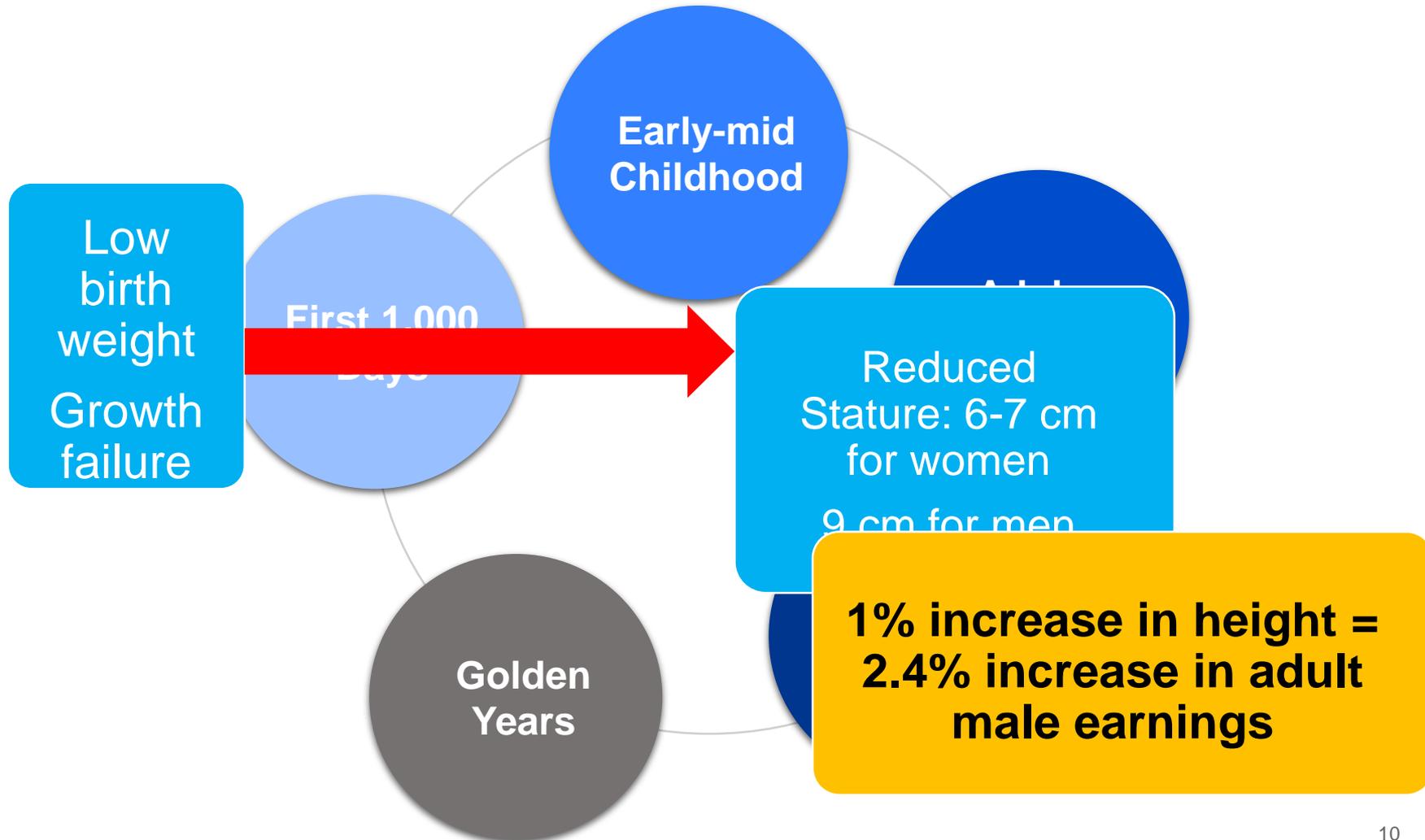
Stunting: A Life Cycle Approach



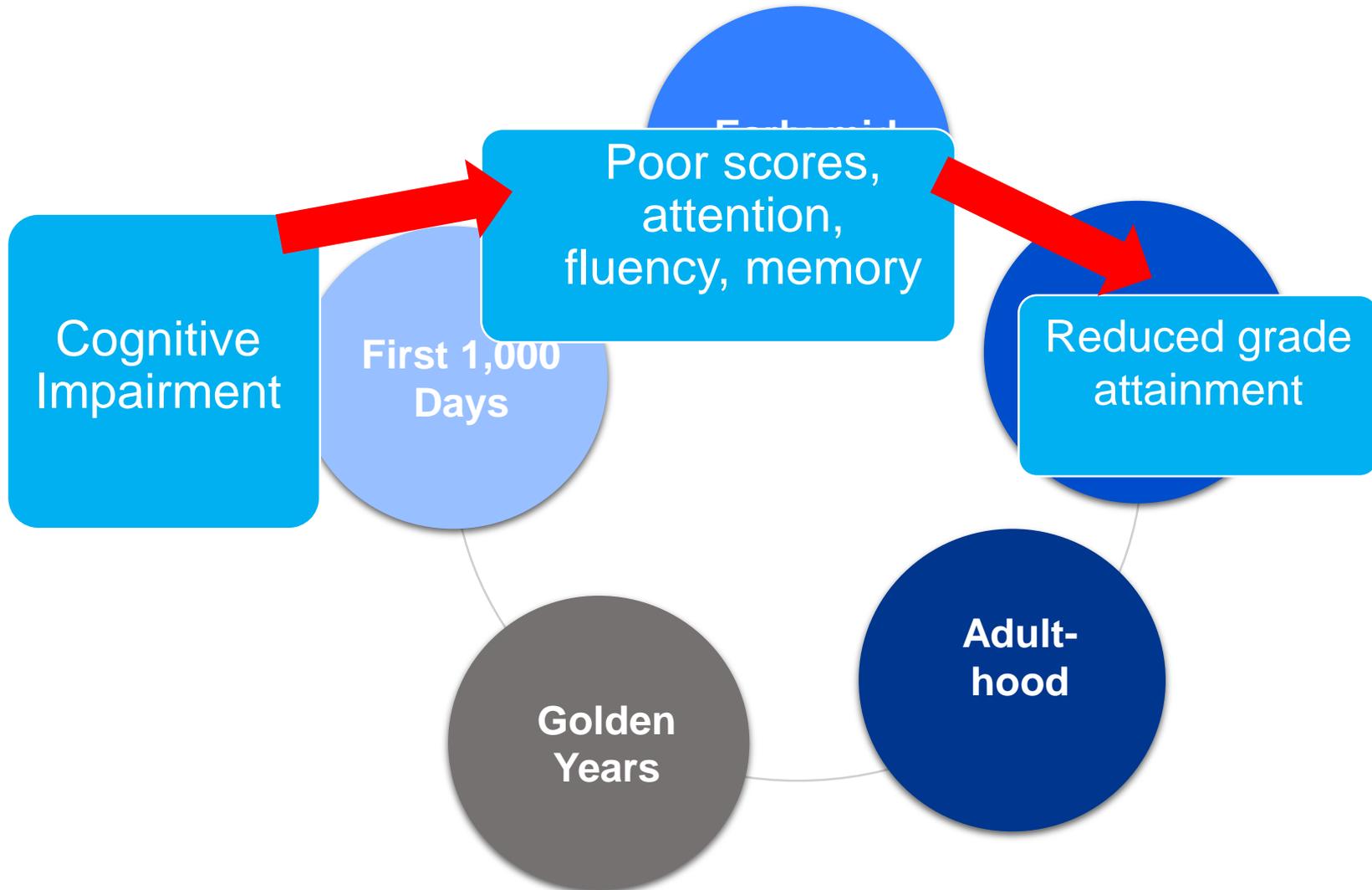
Physical Growth Impairment's Consequences



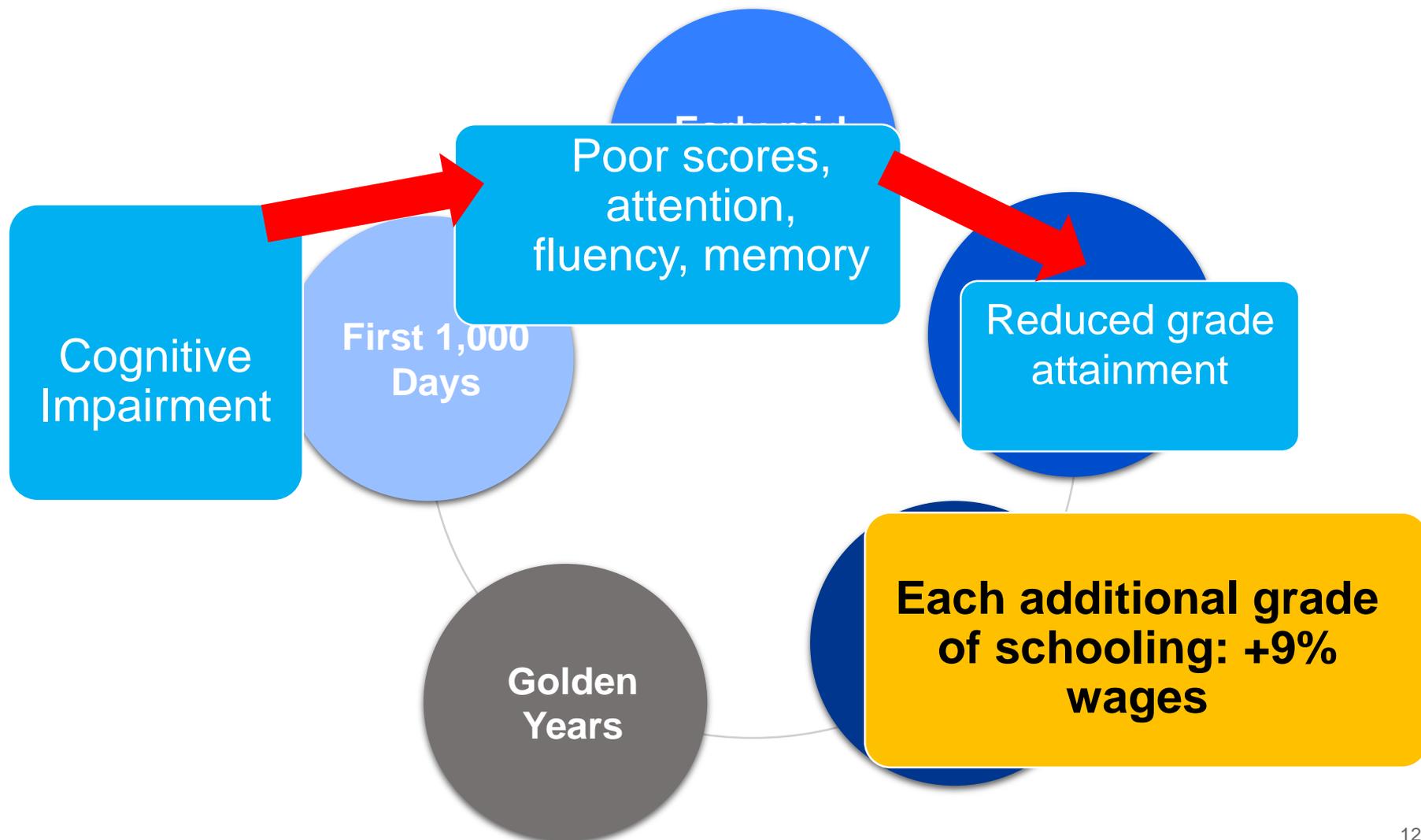
Stunting: Cost to individuals



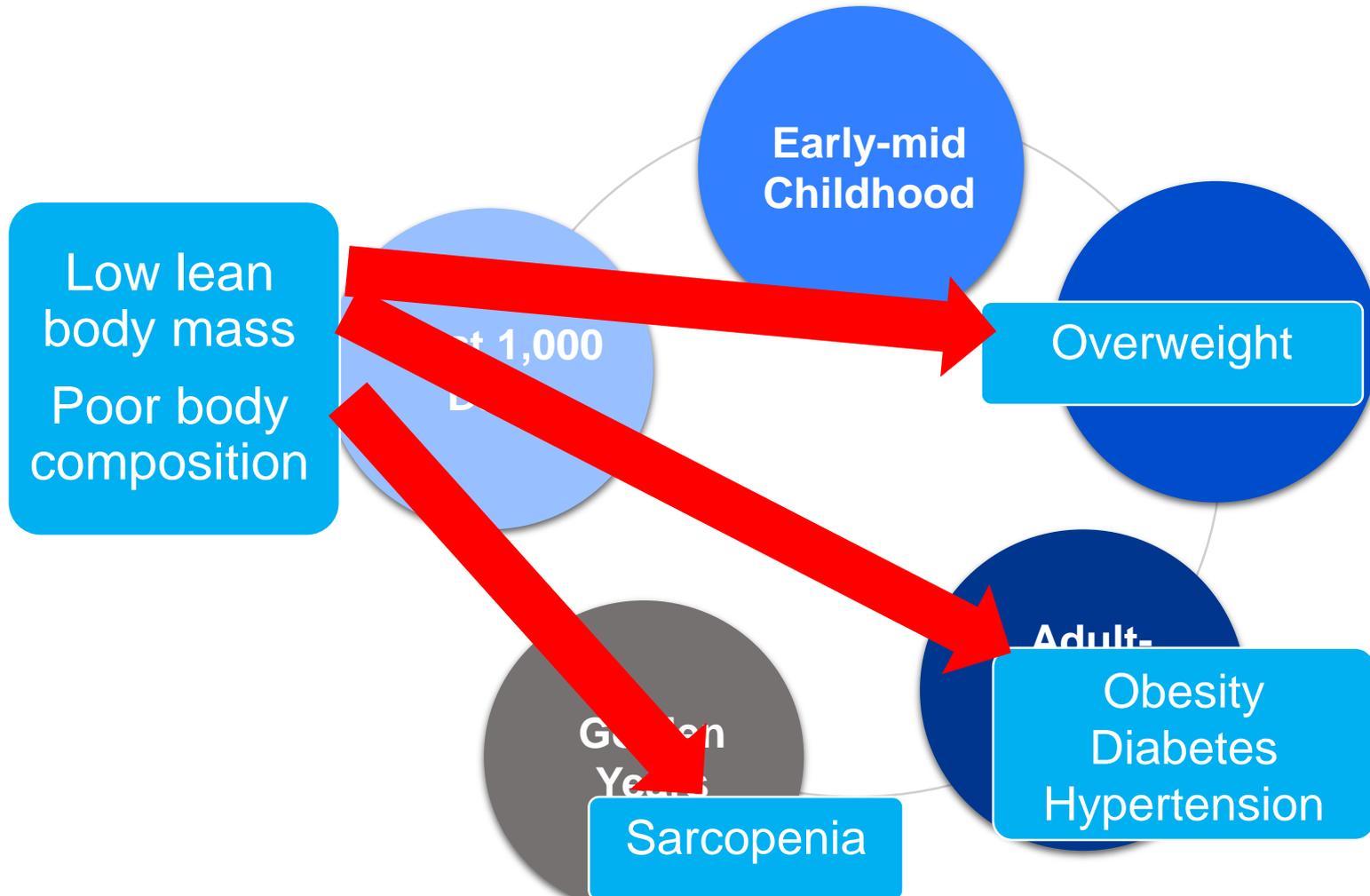
Cognitive Growth's Consequences



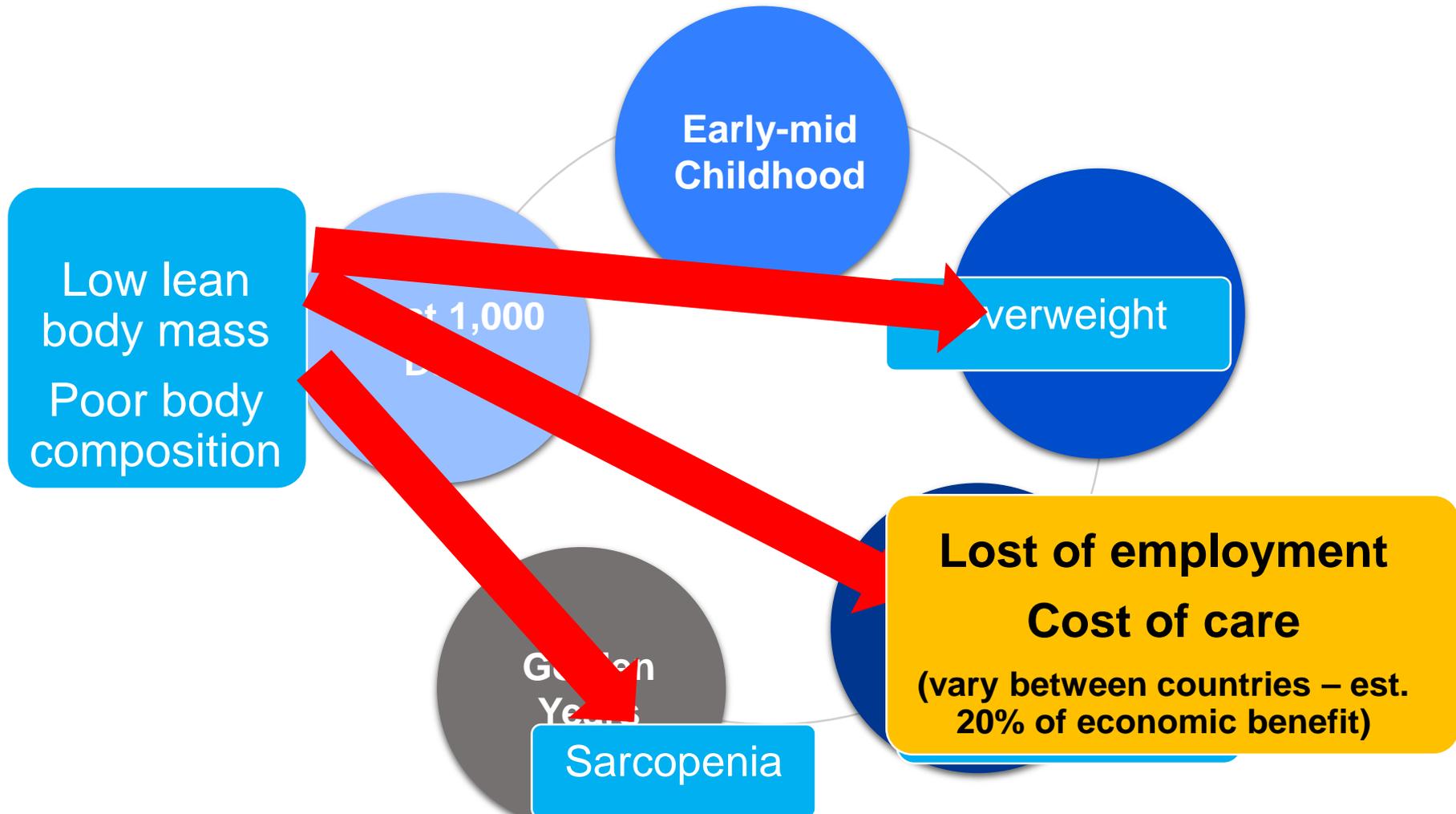
Stunting: Cost to Individuals



Stunting: Long-term Impacts



Long-term costs of stunting



Investments in Stunting Reduction: High Returns



Reduced
Morbidity



Physical
Growth



Stimulate
Cognitive
Development



Reduced
Chronic
Diseases

Every \$ invested in reduction of stunting
generates ~\$18 in economic returns

In East Asia: Benefit Cost Ratios Even Higher

Vietnam 1: \$35.5

Philippines 1: \$43.9

Indonesia 1: \$47.9

Burma 1: \$17.7

Bangladesh 1: \$18.4

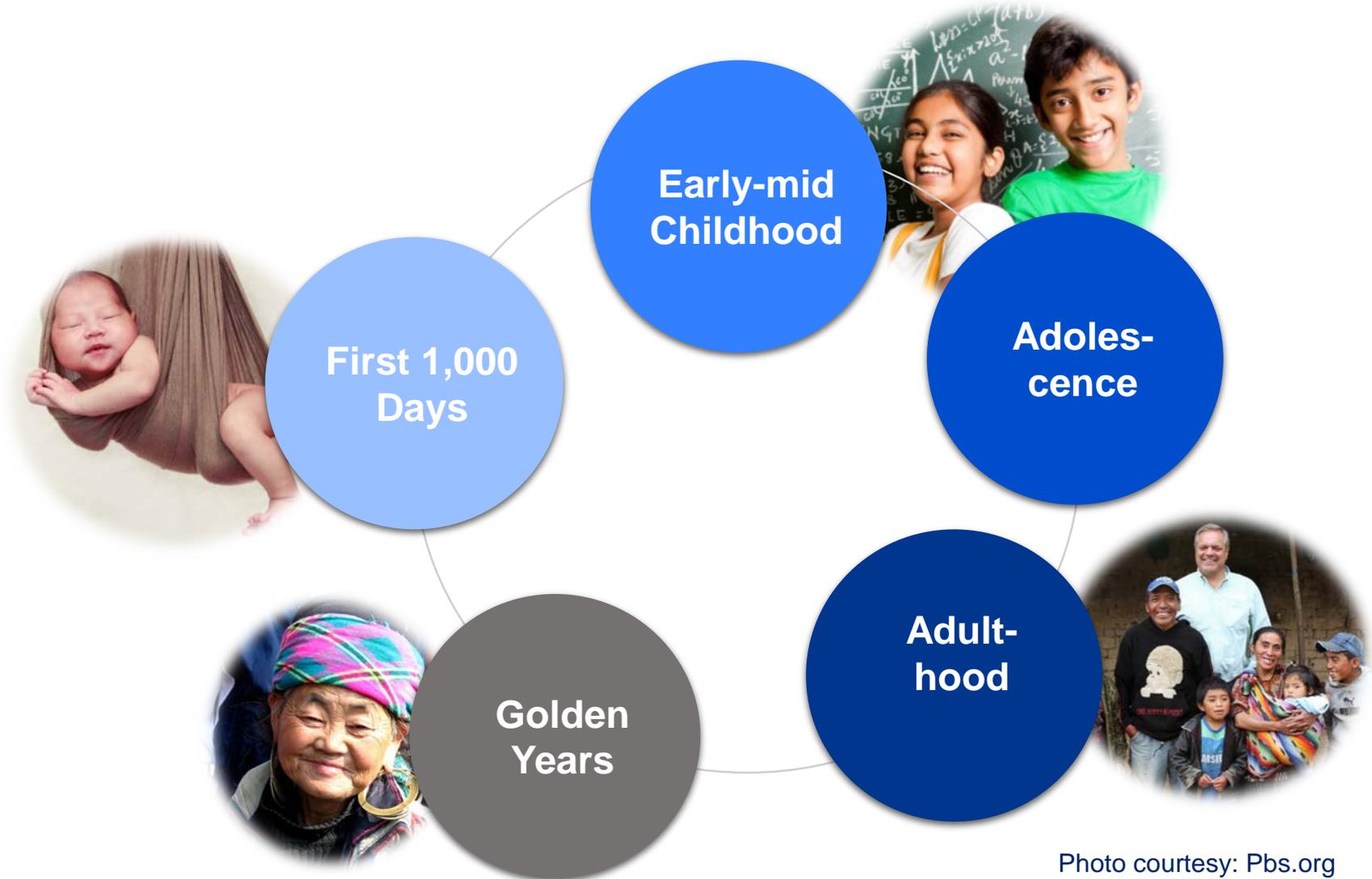


Source: FantaProject.org

How Do Dairy Nutrients Impact Economic Growth in Emerging Economies?

- ✓ Moderate malnutrition recovery
- ✓ Linear growth and related cognitive development
- ✓ Reduction of stunting in-utero
- ✓ Catch-up growth
- ✓ Improvement of lean body mass
- ✓ Reduction of obesity risk
- Reduction of chronic diseases risk later in life

Dairy and the First 1,000 Days



Recent Studies: Dairy Effective for MAM, Growth

- Dairy ingredients recognized as superior to plant proteins, even at lower inclusion rates:
 - ✓ “There is a consistent benefit of FBF that include dairy in treatment of children with MAM” (Suri et al. 2016)
 - ✓ Dairy vs. soy: Higher recovery rates and improved growth (Stobaugh et al. 2016)
 - ✓ “Superior performance of dairy protein in the treatment of acute malnutrition” (Batra et al, 2016)

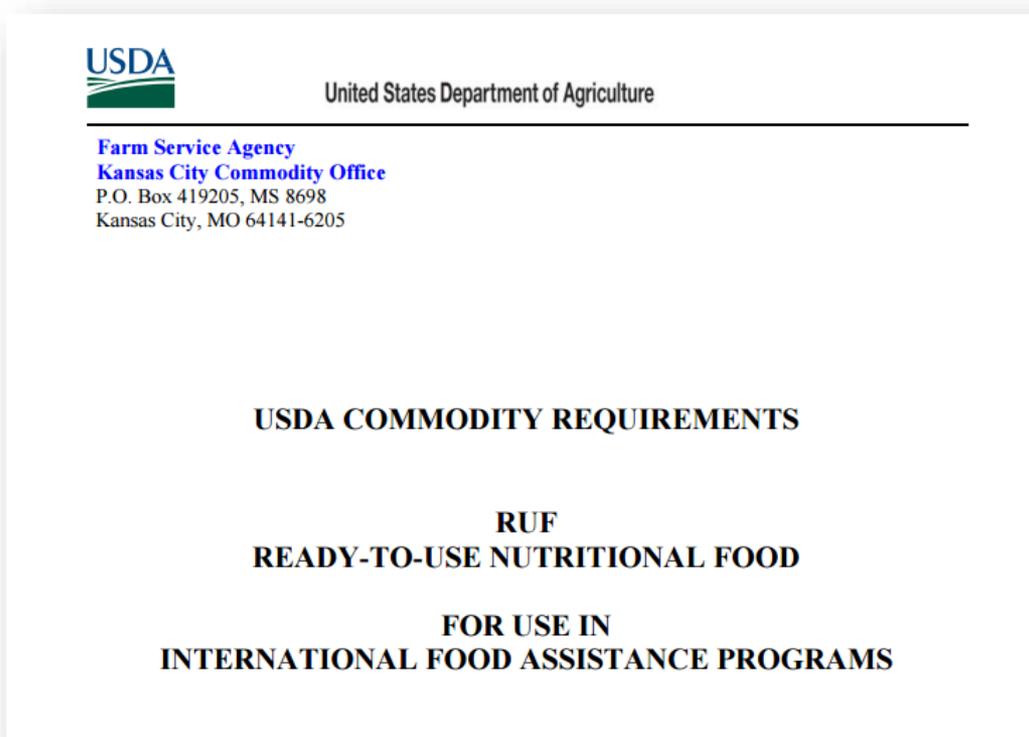
Protein Quality and Growth

- Effect of using proteins of different quality on recovery
- DIAAS Food Aid Score associated with recovery
- “When looking at all the protein quality scores, dairy protein is likely to be higher, and particularly for malnourished children, dairy proteins are associated with higher growth”

(Manary et al. 2016, Review of 6 clinical trials)

Current USDA Standards (December 2015)

- Therapeutic foods:
50% of protein from dairy
- Supplementary foods: 33% of protein from dairy



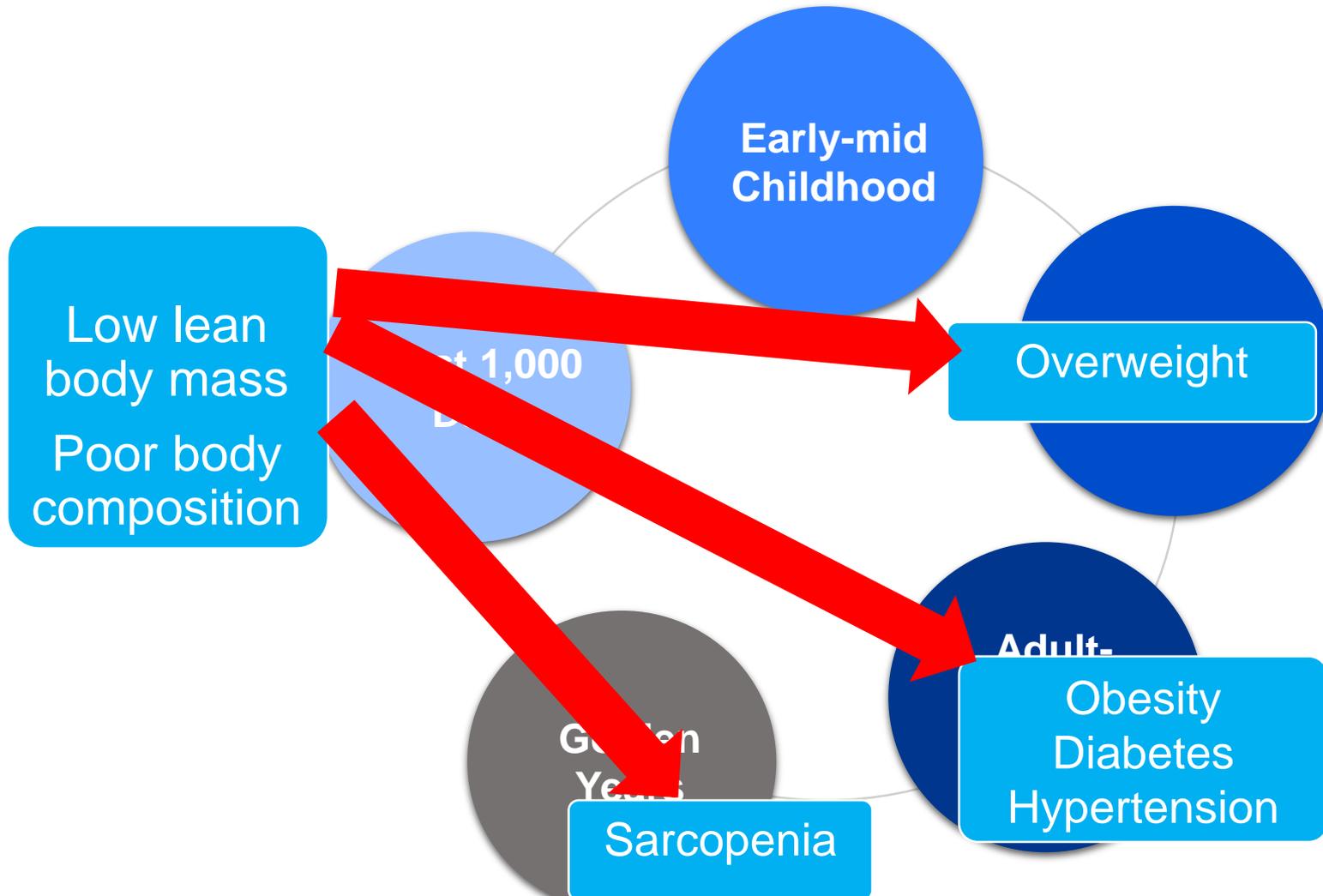
Source:
<https://www.fsa.usda.gov/Assets/USDA-FSA-Public/usdafiles/Comm-Operations/pdf/ruf.pdf>

Pregnant Mothers and Malnutrition

- Positive association between maternal dairy intake and birth weight
- >3 glasses per day = larger head circumference, femur length
- Supplementation of mothers: micronutrients alone not sufficient
- Small doses with dairy = 25-31% reduction in stunting, small head size

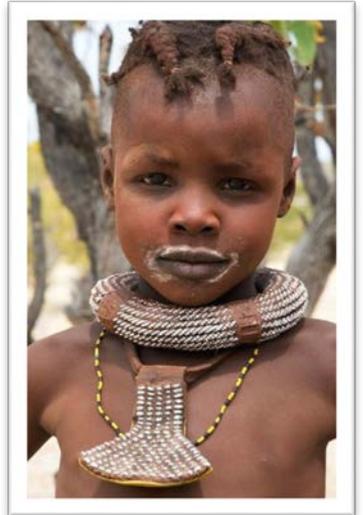
(Mridha et al. 2016)

Stunting: Long-term Impacts



Managing Double Burden of Malnutrition

- Legitimate concern about long-term impact of supplements provided to manage malnutrition
- Treatment is usually only a few weeks long, but broader use (adolescent mothers, catch-up growth/ school meals) could become more common



Beyond 1,000 Days: Dietary Patterns Studies

Dairy dietary pattern is positively associated with changes in length for age scores

“Introduction of animal source foods such as dairy is important...high quality protein, bioactive components essential for growth”

✓ Important to introduce dairy products as part of complementary foods to optimize linear growth

(Arsenault, et al. 2016. Peru)

Dairy is Associated with Lean Body Mass

- Reports of lean body mass increases in a number of studies with children receiving milk (Kulkarni et al. 2014)
- Substantial evidence that higher intake of milk is positively associated with lean body mass in infancy, childhood and adolescence in low income countries (Kulkarni et al. 2014, Hoppe et al.2006, Allen 2011)

Dairy Reduces Obesity Risk

Long-term association between dairy consumption and reduced risk of child obesity

- Meta analysis (>46,000 children): children in highest dairy intake group 38% less likely to be obese

- Risk of childhood obesity 13% lower with each serving per dairy increment dairy intake
- Effect is through lean body mass increases/ fat mass decrease
- Key: dairy proteins (leucine) + minerals

(Lu et al. 2016. Developed countries)

Pregnant Mothers and Overnutrition

- Higher maternal protein intake at the expense of carbohydrate or fat intake at 26–28 wk gestation associated with lower abdominal internal adiposity in neonates.

(Chen et al. 2016, Singapore)



Dairy Reduces Risk of Chronic Diseases

Meta-analyses and systematic reviews support a negative relationship between the consumption of dairy products and the risk of the metabolic syndrome and Type 2 diabetes

(Chen et al. 2015)



Photo courtesy: Whey Protein Research Consortium, USA

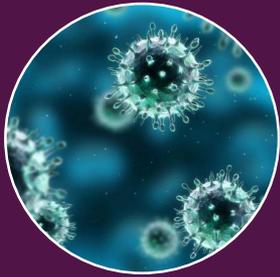
Prevention of Obesity; Role of Whey

- Study in China: 200 ml of milk/day + 1 egg to decrease malnutrition
- Boys' lean body mass increased and no difference in obesity/overweight group vs. control (no supplement)
- Dairy proteins, in particular BCAAs in **whey**, play a key role
- “Dairy proteins have a high potential of improve metabolic disturbances due to their amino-acid composition”

(Lin et al. 2015)

(Bjornshave et al. 2014)

Dairy and Economic Growth: Emerging Science



Reduced
Morbidity

Microbiome



Physical
Growth



Stimulate
Cognitive
Development

Role of other dairy
nutrients



Reduced
Chronic
Diseases

In Summary

- Each \$ invested in malnutrition yields high economic returns
- Dairy nutrients are now proven to help manage undernutrition, prevent stunting
- The “extra cost” of dairy is small: less than \$1.36 per child who recovers from malnutrition, \$0.0017/ration
- Dairy nutrients can also provide life-long protection from chronic diseases in developing countries

Thank you

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Full references and sources available upon request