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Effects of Nutrition in the First Two Years of Life on the Prevention of Obesity

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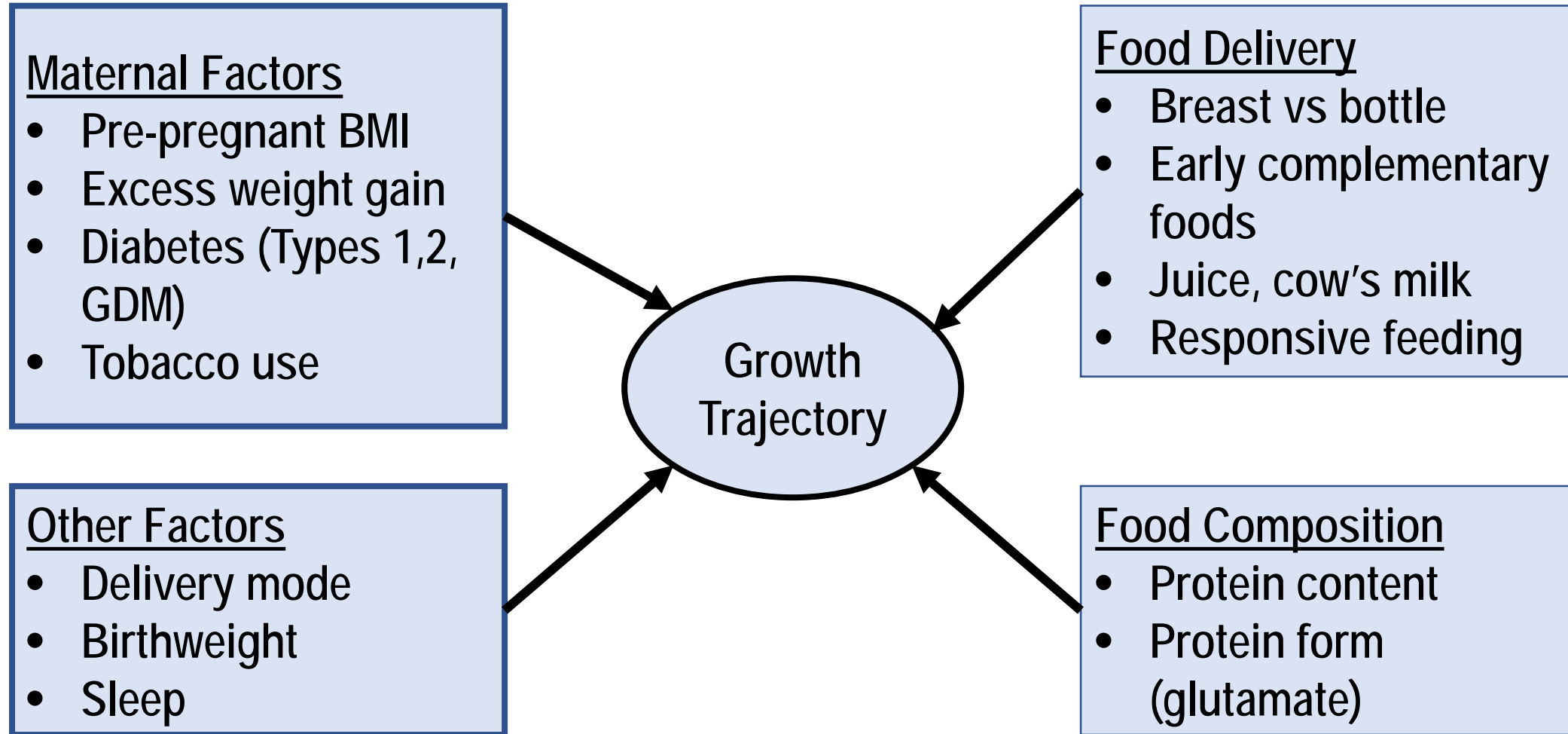


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Prevention & Wellness

Factors Affecting Growth in the First Two Years



Woo Baidal et al. AJPM 2016; 50:761; Li R et al. Arch Pediatr Adol Med 2012; 166:431; Koletzko B et al. AJCN 2009; 89:1836
Mennella JA et al. AJCN 2018; 108:1015

Odds for Childhood Obesity Predicted by Early Weight Gain

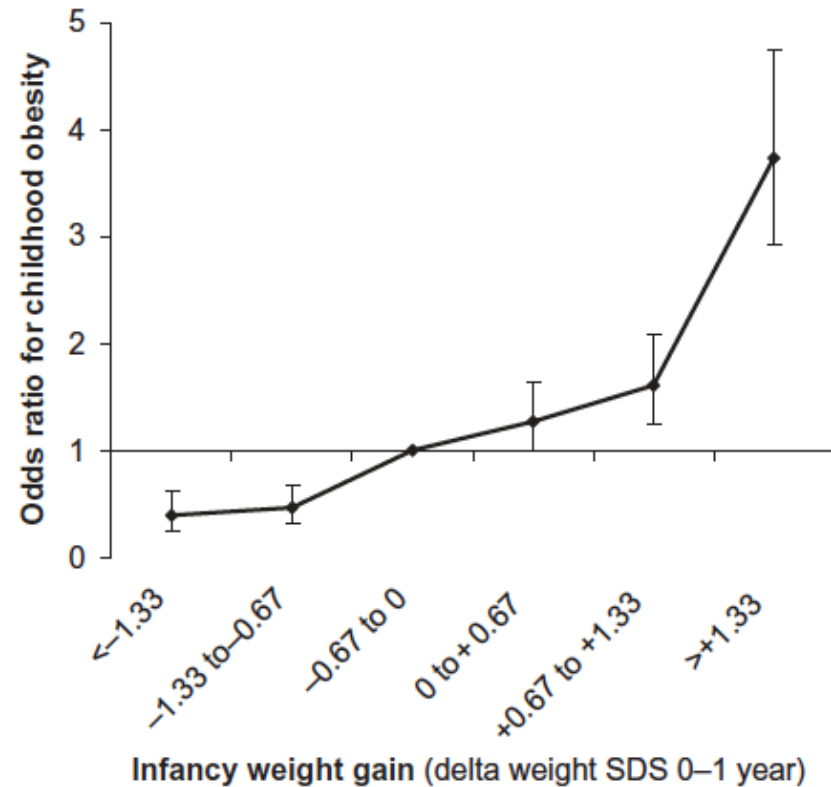


Figure 2. Odds ratios for childhood obesity by infant weight gain 0-1 year. Adjusted for sex, age and birthweight.

Results from a meta-analysis of 10 international cohort studies; 47,661 participants

Risk is particularly high for the 21% of infants with very rapid weight gain, e.g. equivalent to upward centile crossing of ≥ 2 or more bands on standard growth chart

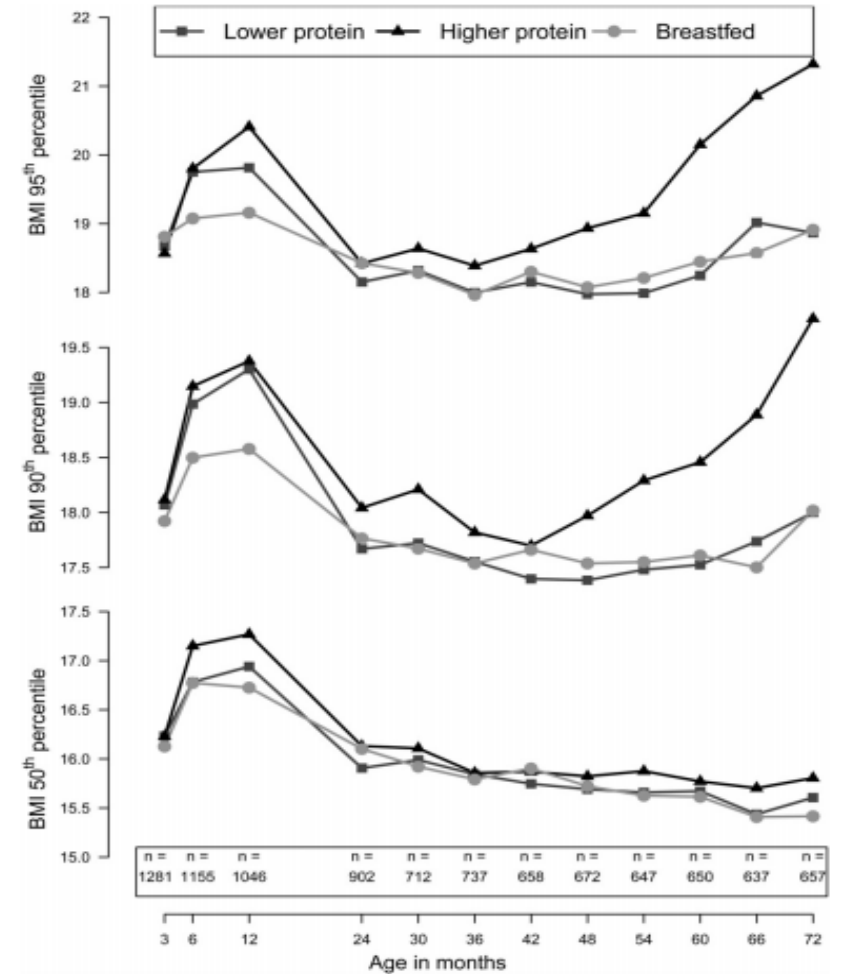
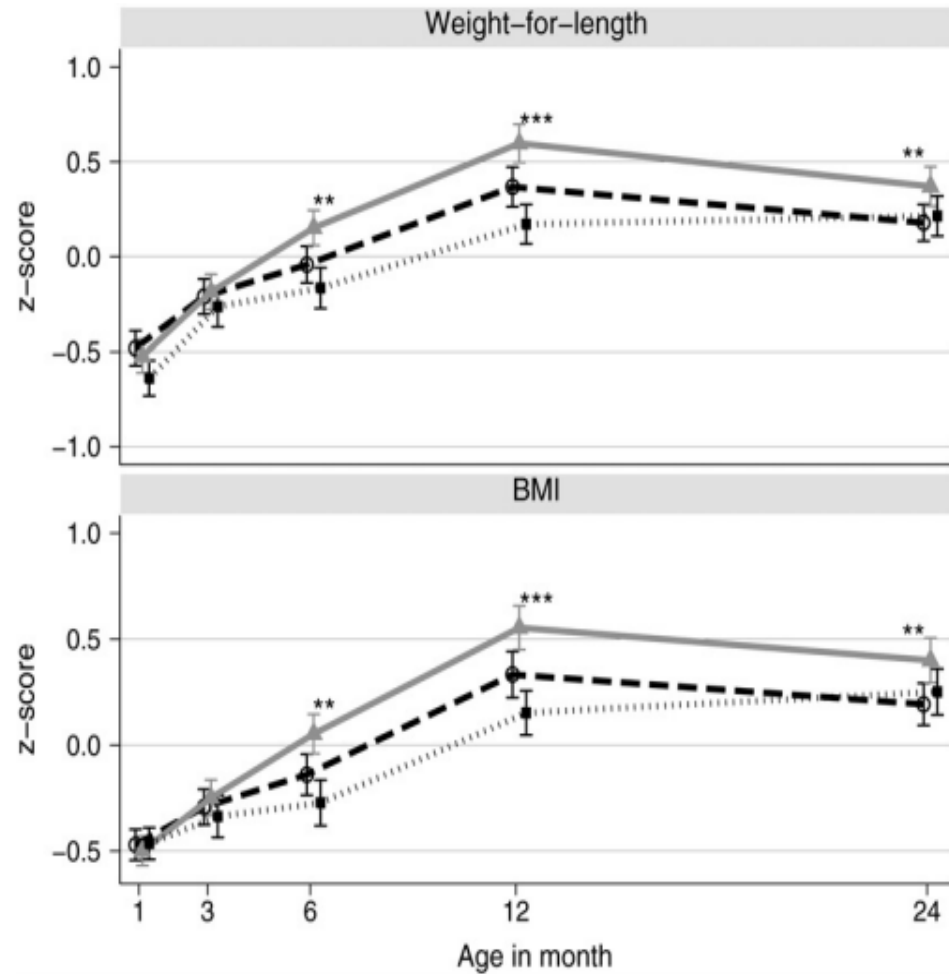
The Childhood Obesity Study – 2002-2004 with Follow-up at Age 6 yo

European multicenter double blind randomized trial in 5 countries

- Infants exclusively formula fed at 8 weeks life
- 313 lower protein (7.1% energy), 323 higher protein (11.7% energy) with identical energy density; follow-on formula 8.8% and 17.6% energy
- Observational group: 298 breastfed exclusively until 4m age
- Follow-up: 3, 6, 12, and 24 m; endpoints length for age and weight for length z-scores
- Additional follow-up at 6 yo.; measured heights and weights from 227 lower protein, 221 higher protein, and 209 breastfed

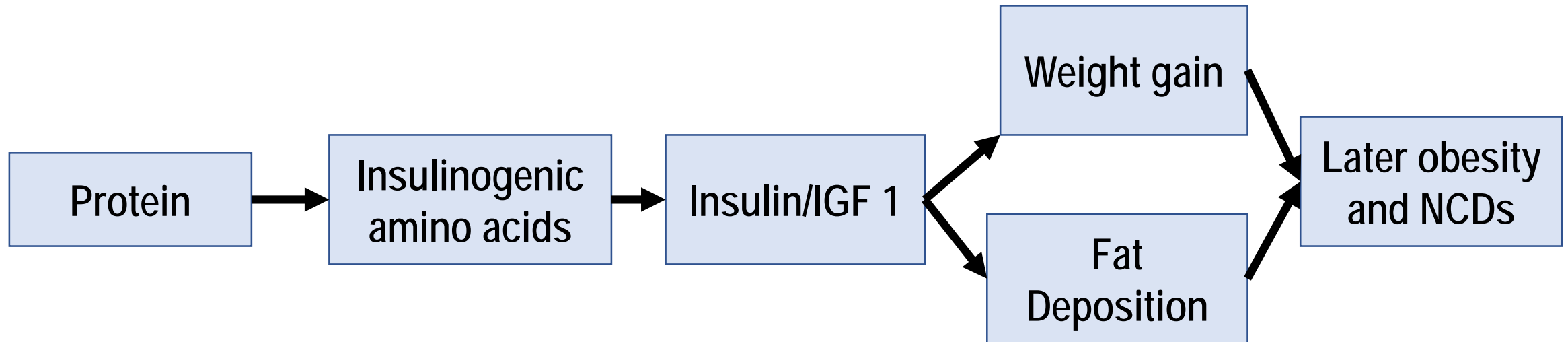
Koletzko B et al. AJCN 2009; 89:1836; Weber M et al. AJCN 2014; 99:1041

Effect of High Protein Diet on Obesity Risk at 2 and 6 Years of Age



Koletzko B et al. AJCN 2009; 89:1836; Weber M et al. AJCN 2014; 99:1041

Potential Mechanism for the Early Protein Hypothesis



Koletzko B et al. Am J Clin Nutr 2016; 103:303

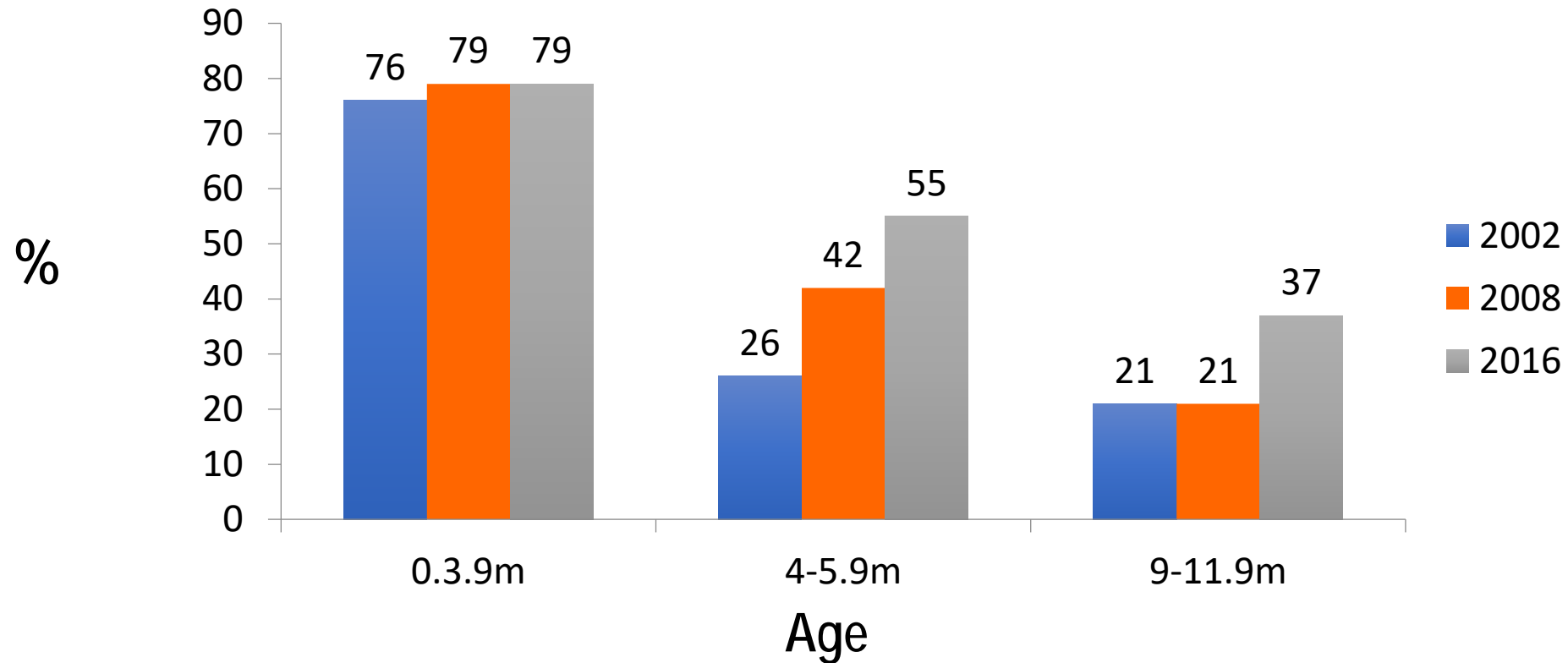
Feeding Infants and Toddlers Study (FITS 2016)

Sample Characteristics

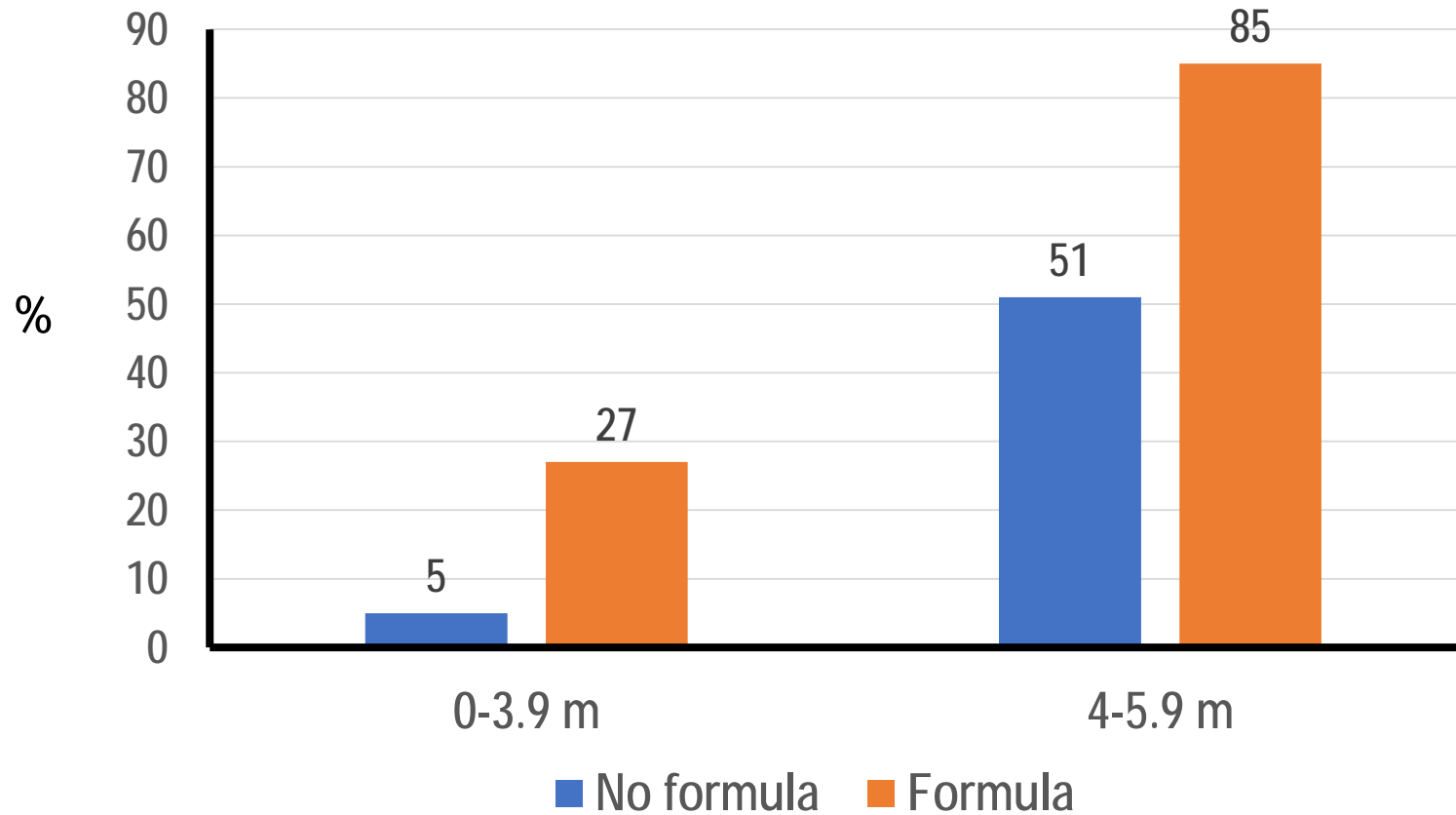
	Overall	Hispanic	NH White	NH Black	NH Other
0-11.9 months)	1494	221	1001	189	83
12-23.9 months)	1130	161	770	150	49
0-23.9 months	2624	382	1771	339	132

- 51% male; 49% female; more likely white, less likely Hispanic
- 22.9% caregivers had high school/GED education or less
- Questions similar to FITS 2002 and 2008
- Dietary data collected from 24h recall, repeated in 25%

% of Infants Ever Consuming Breastmilk FITS 2002, 2008, and 2016



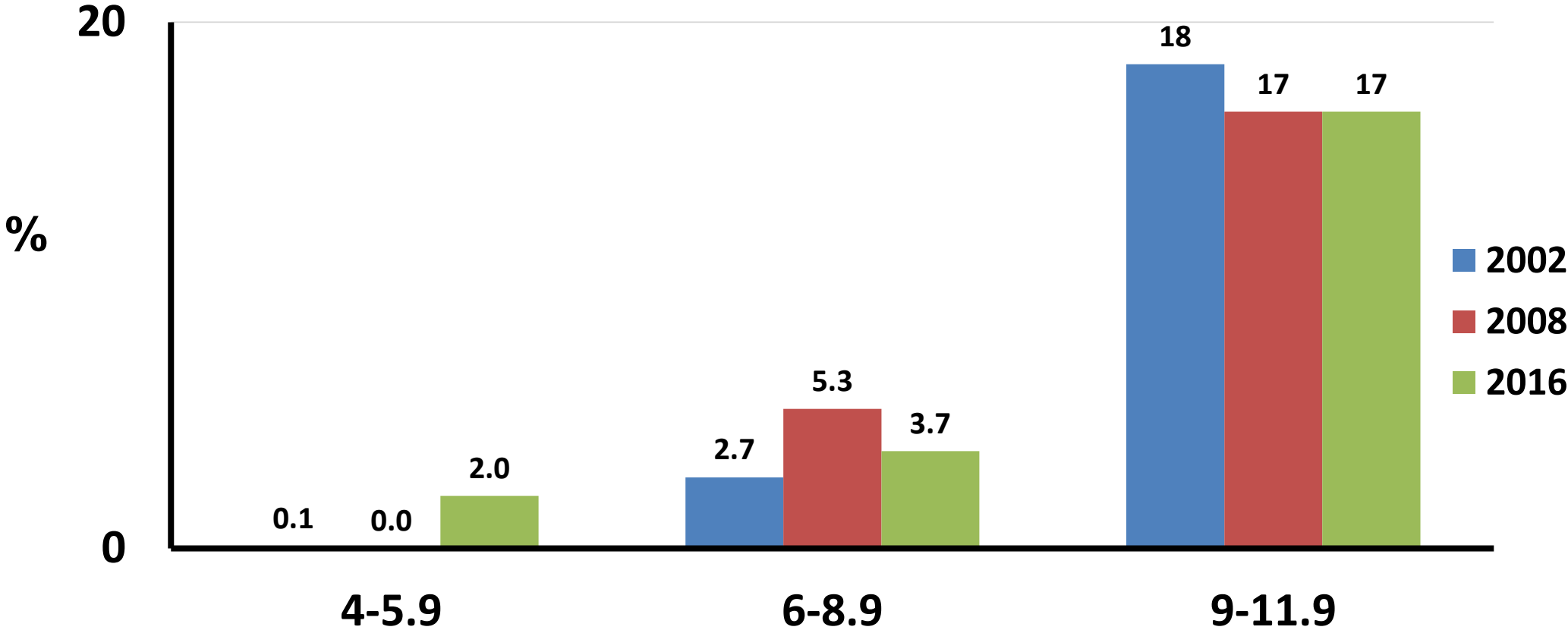
FITS 2016: Percent Consuming Complementary Foods (cereal, meat, fruit, or vegetable puree)



Roess A, et al. J Nutr 2018; 148: 1525S

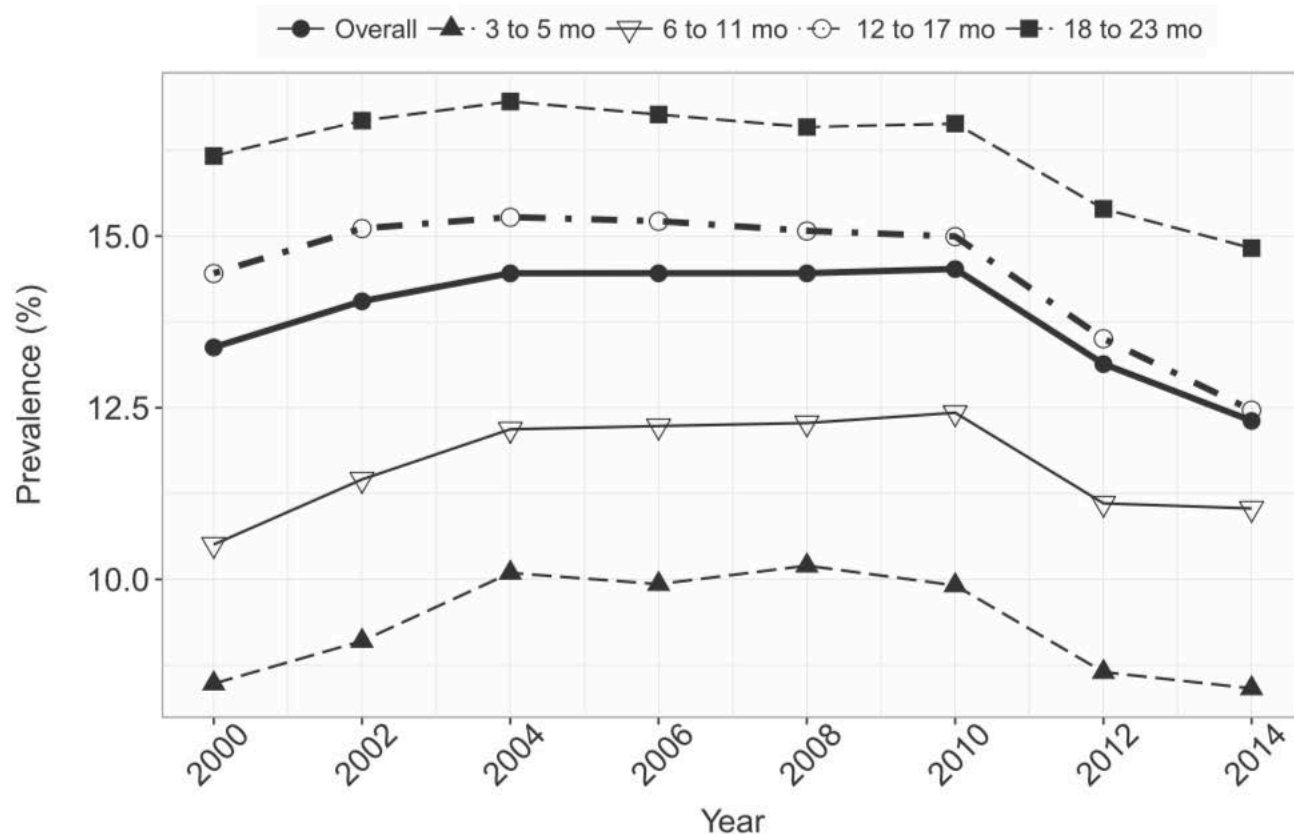
Percent of Infants Consuming Cow's Milk

FITS 2002, 2008, 2016



Roess A, et al. J Nutr 2018; 148: 1525S

Changes in Obesity Coincident with Changes in the WIC Package



Substitution of 16 qts 1% milk for 24 qts whole milk
7488 kcal/m

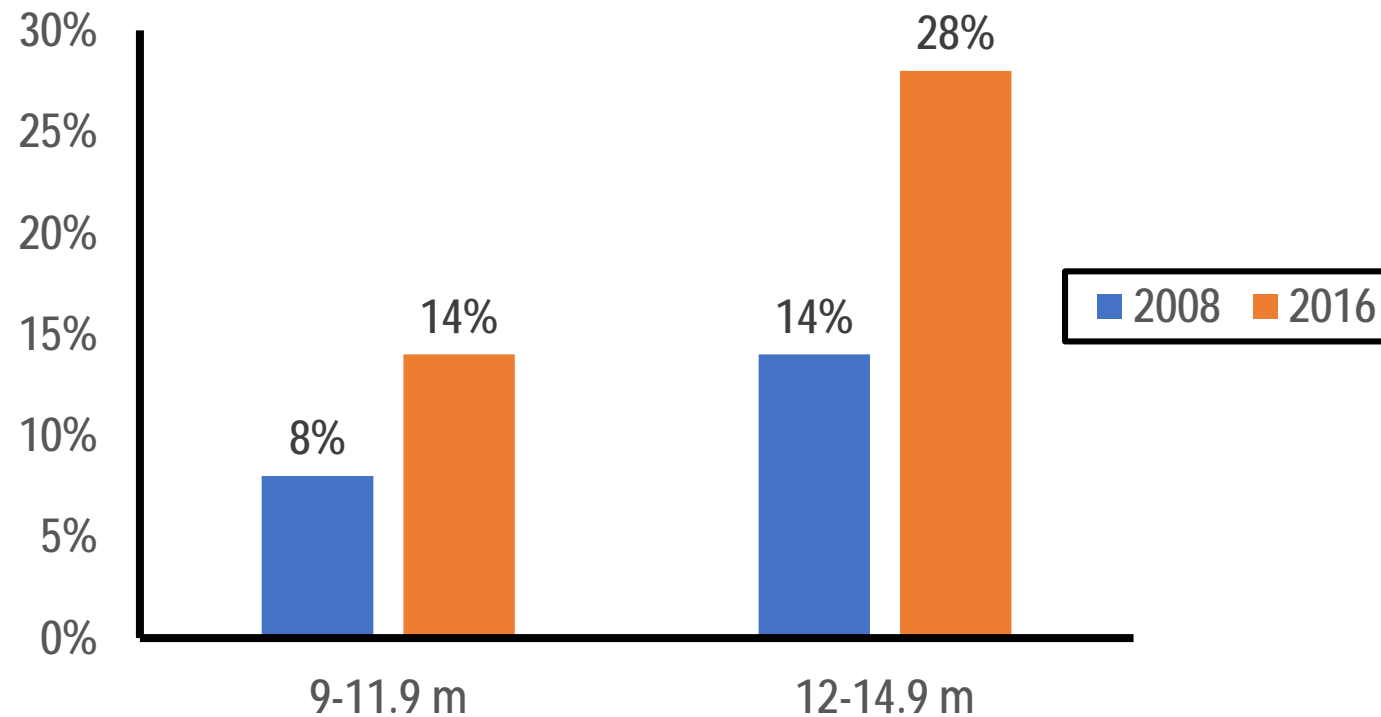
Decreased orange juice from 228 fl oz to 128 fl oz/m
1400 kcal/m

Total decrease 8888 kcal/month = 297 kcal/d
Increases in the "fully breastfeeding" package

www.fns.usda.gov/wic/final-rule-revisions-wic-food-packages
Chaparro MP, et al. Am J Clin Nutr 2019; 00:1

Freedman DS et al. Pediatrics 2017; 139: e20162034

Consumption of Sugary Drinks – FITS 2008 and 2016



Roess A, et al. J Nutr 2018; 148: 1525S

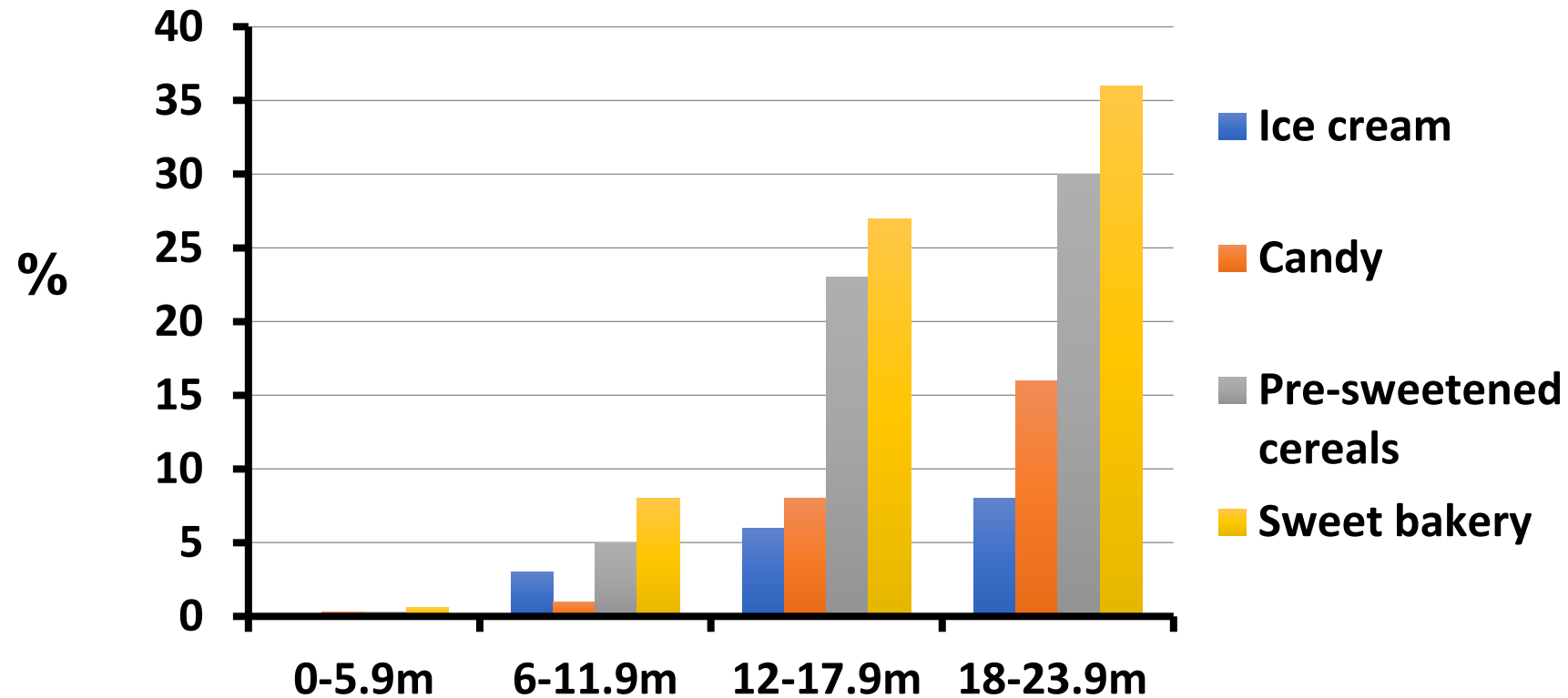
Effect of Sugary Drink Intake in Infancy on Obesity at 6 yo; IFPS II (2005-2007) Followup

Infancy	Obesity Prevalence
• No SDs	8.6%
• Any SDs	17.0%
Age at SD introduction	
• No SDs	8.6%
• ≥ 6 mo	15.6%
• ≤ 6 mo	20.4%

Sugary drinks defined as juice drinks, soda, sweet tea, Kool Aid

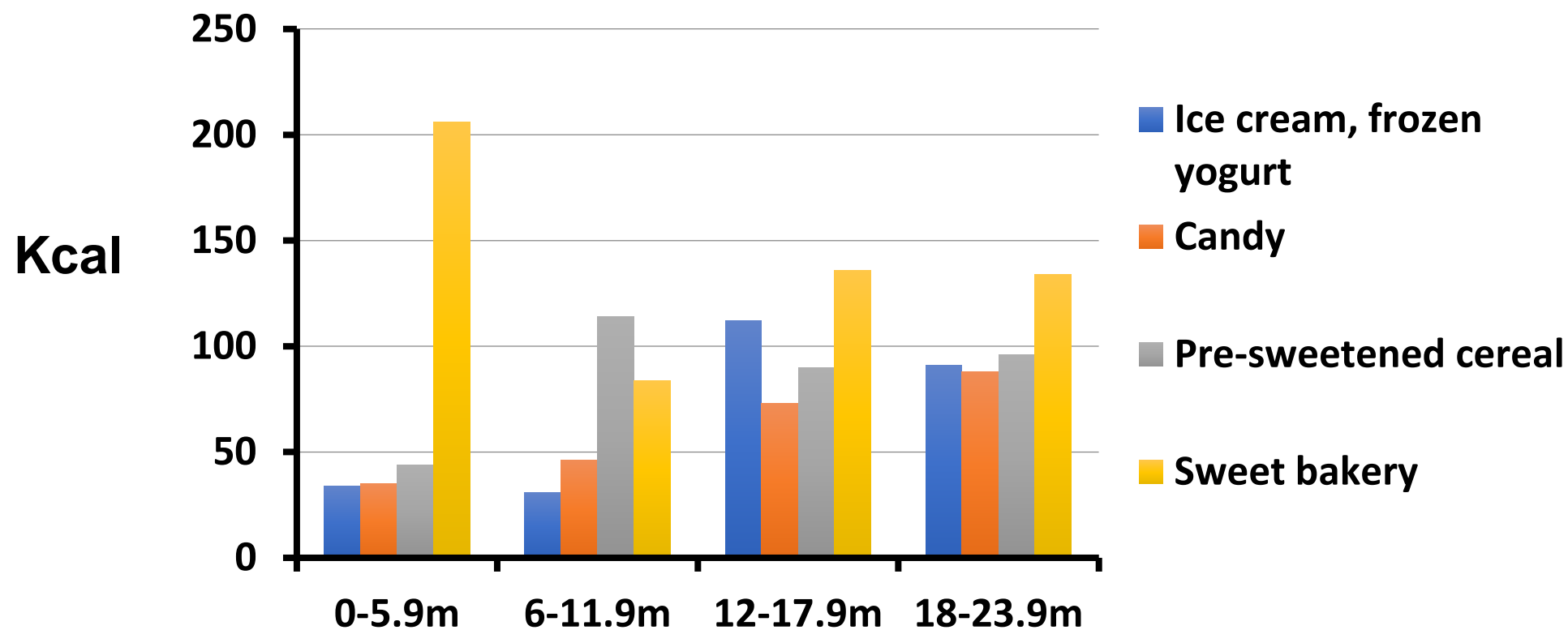
Percent 0-2 yo Consuming Sweetened Products by Age

FITS 2016



Roess A, et al. J Nutr 2018; 148: 1525S

Kcal from Sweetened Foods by Consumers by Age FITS 2016



Roess A, et al. J Nutr 2018; 148: 1525S

Feeding Recommendations

Early identification of high risk infants

- Birthweight
- Excessive maternal weight gain during pregnancy
- Tobacco use during pregnancy

Initiate and sustain breastfeeding

Delay introduction of complementary foods

No juice in children <1 yo, < 4oz in children 1-3 yo

Avoid cow's milk before 1 y of age

Responsive feeding