



School Meals and Child Health

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Oklahoma Senate Interim Study

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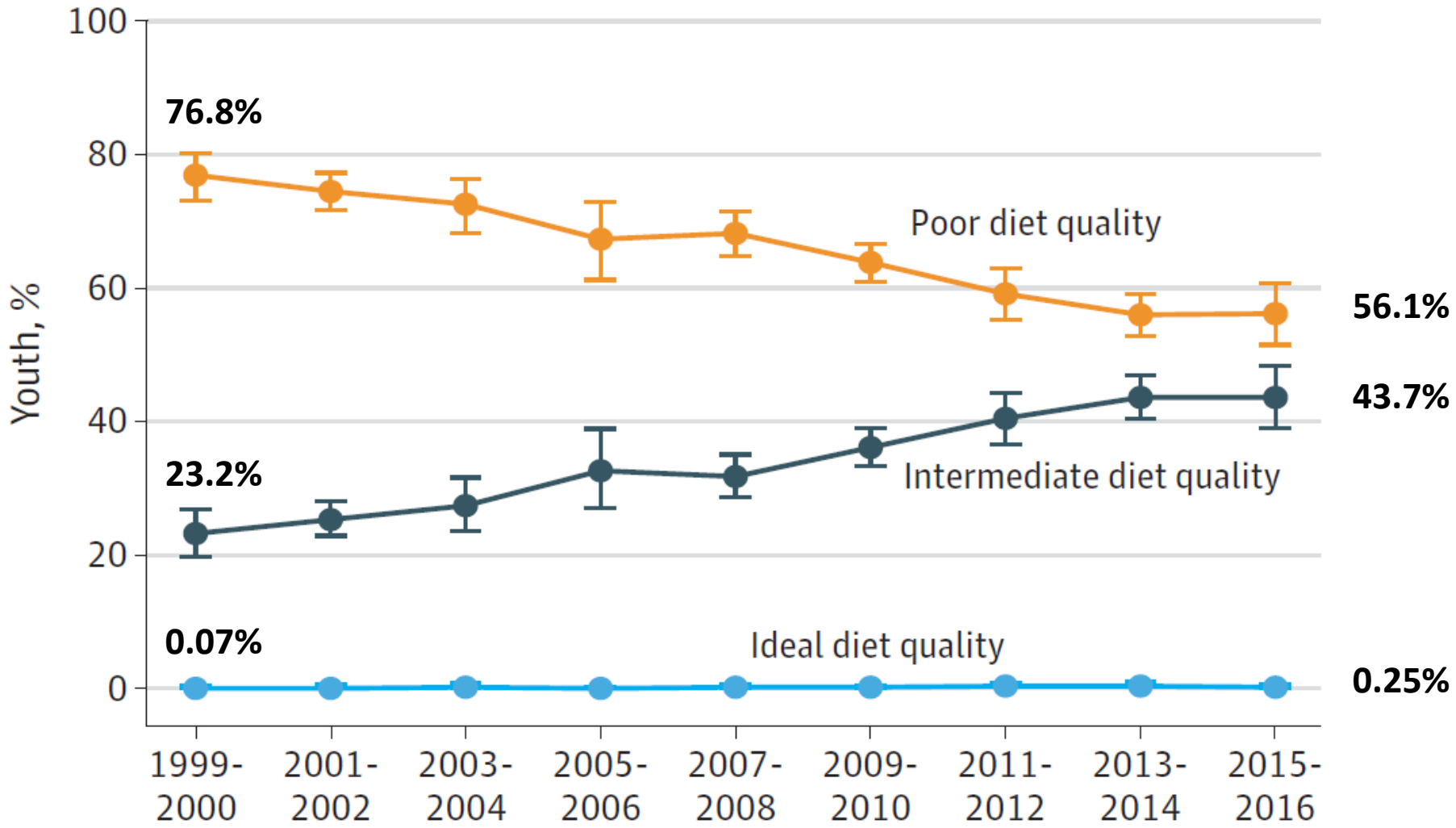
A National Nutrition Crisis

- **More U.S. adults sick than healthy:**
  - **1 in 2** have diabetes or prediabetes
  - **3 in 4** have overweight or obesity
  - **14 in 15** have suboptimal cardiometabolic health
- **Sick American teenagers:**
  - **1 in 3** have prediabetes
  - **1 in 4** have overweight or obesity
  - **1 in 4** have fatty liver disease
- **Poor nutrition each year:**
  - Kills **500,000** Americans
  - Causes **800,000** new diabetes cases
  - Causes **80,000** new cancers
- **Annual economic costs:**
  - **~$2 trillion each year** in healthcare spending and lost productivity
  - Strained **federal and state budgets**
  - Less competitive **U.S. businesses**
  - Reduced **military readiness**

U.S. Burden of Disease Collaborators, JAMA 2018; O'Hearn et al., JACC 2022; Zhang et al., JNCI Cancer Spectr 2019; O'Hearn et al., Nature Med 2023; Centers for Disease Control and Prevention; The Rockefeller Foundation, *The True Cost of Food,* 2021 (adjusted to 2025)

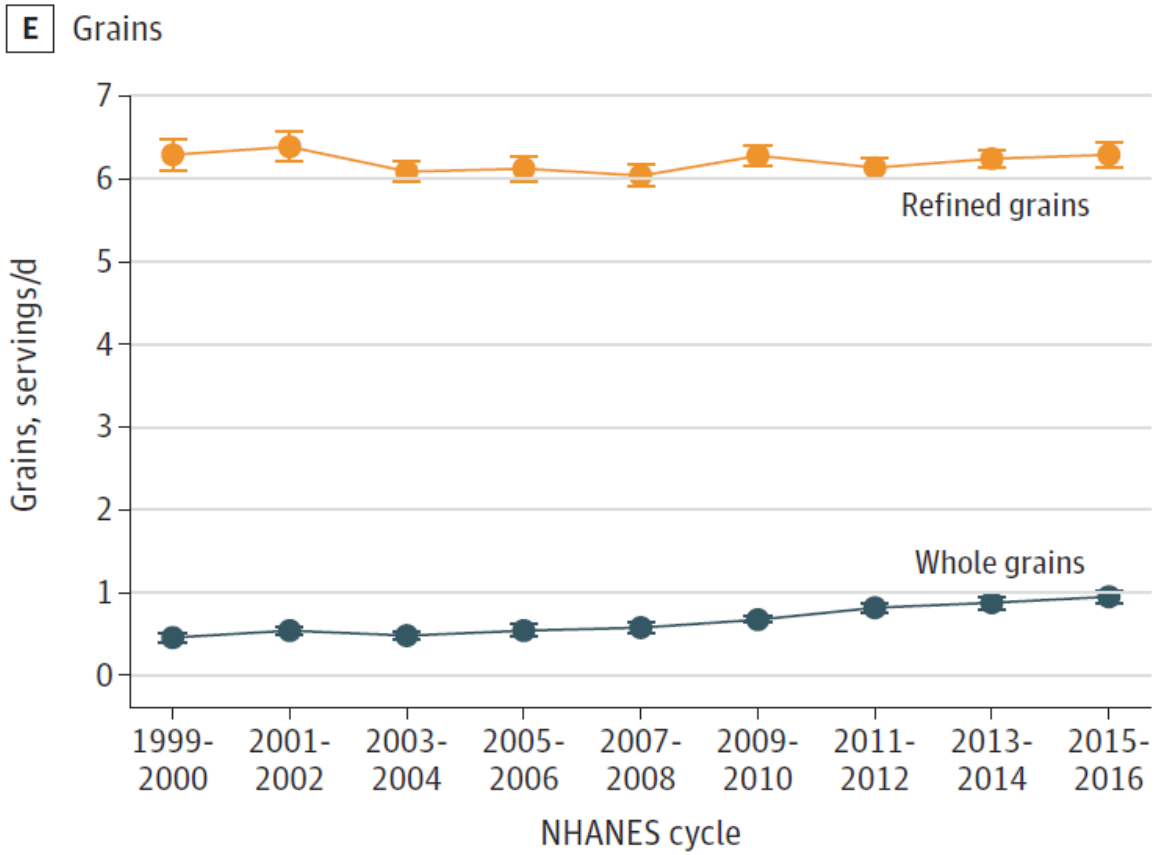
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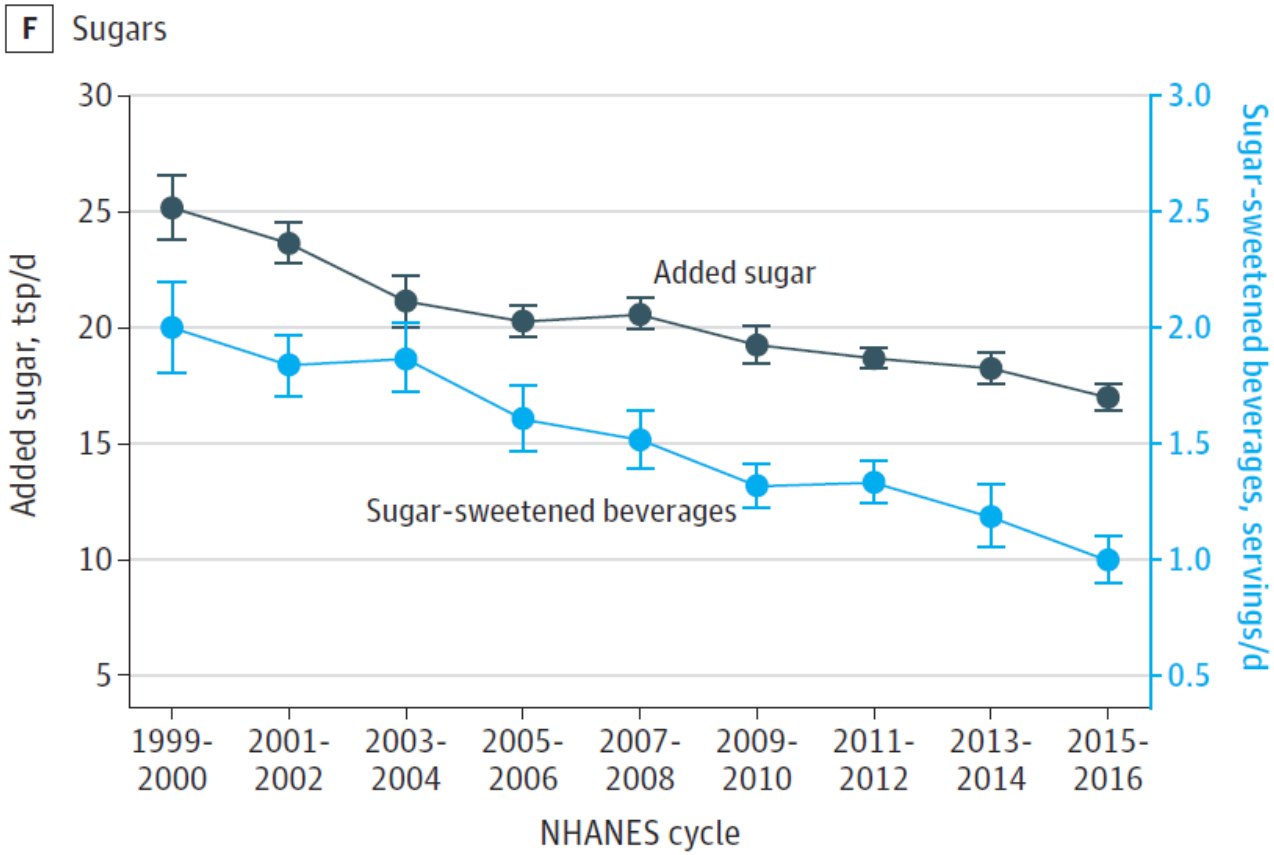
Trends in Diet Quality, US Children



Liu et al., JAMA 2020

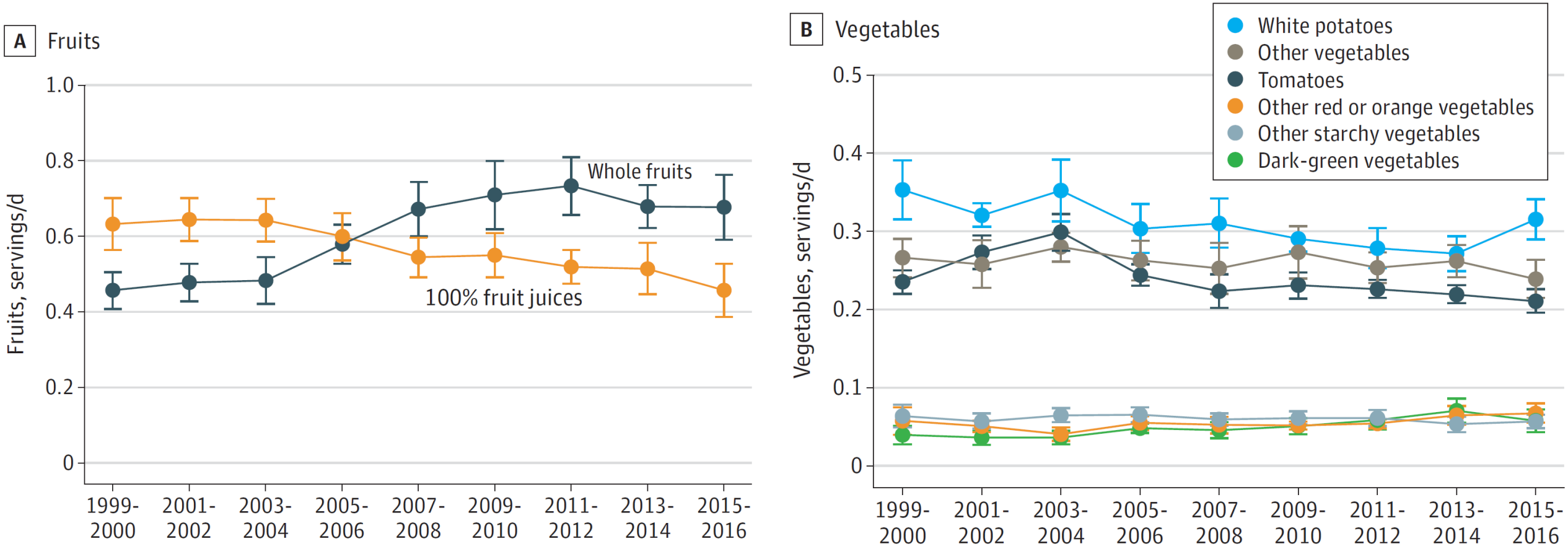
Trends in Grains, Added Sugars, and SSBs, US Children





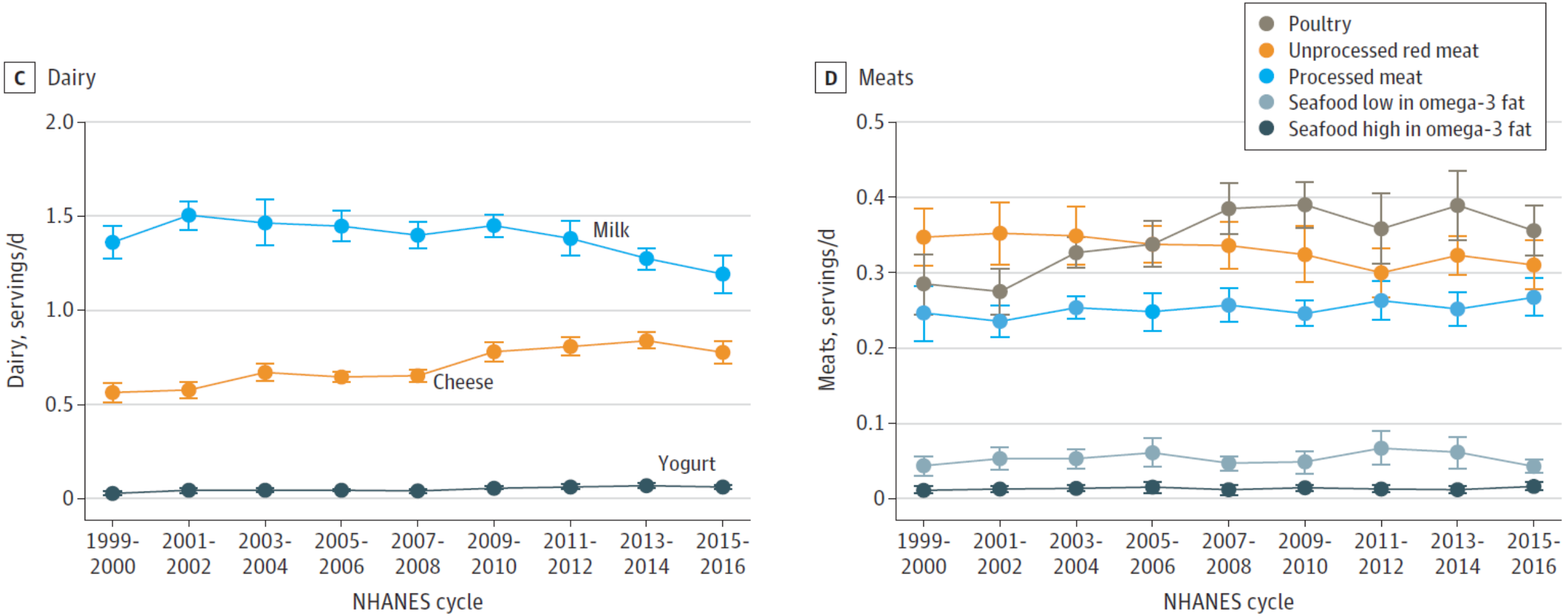
Liu et al., JAMA 2020

Trends in Fruits and Vegetables, US Children



Liu et al., JAMA 2020

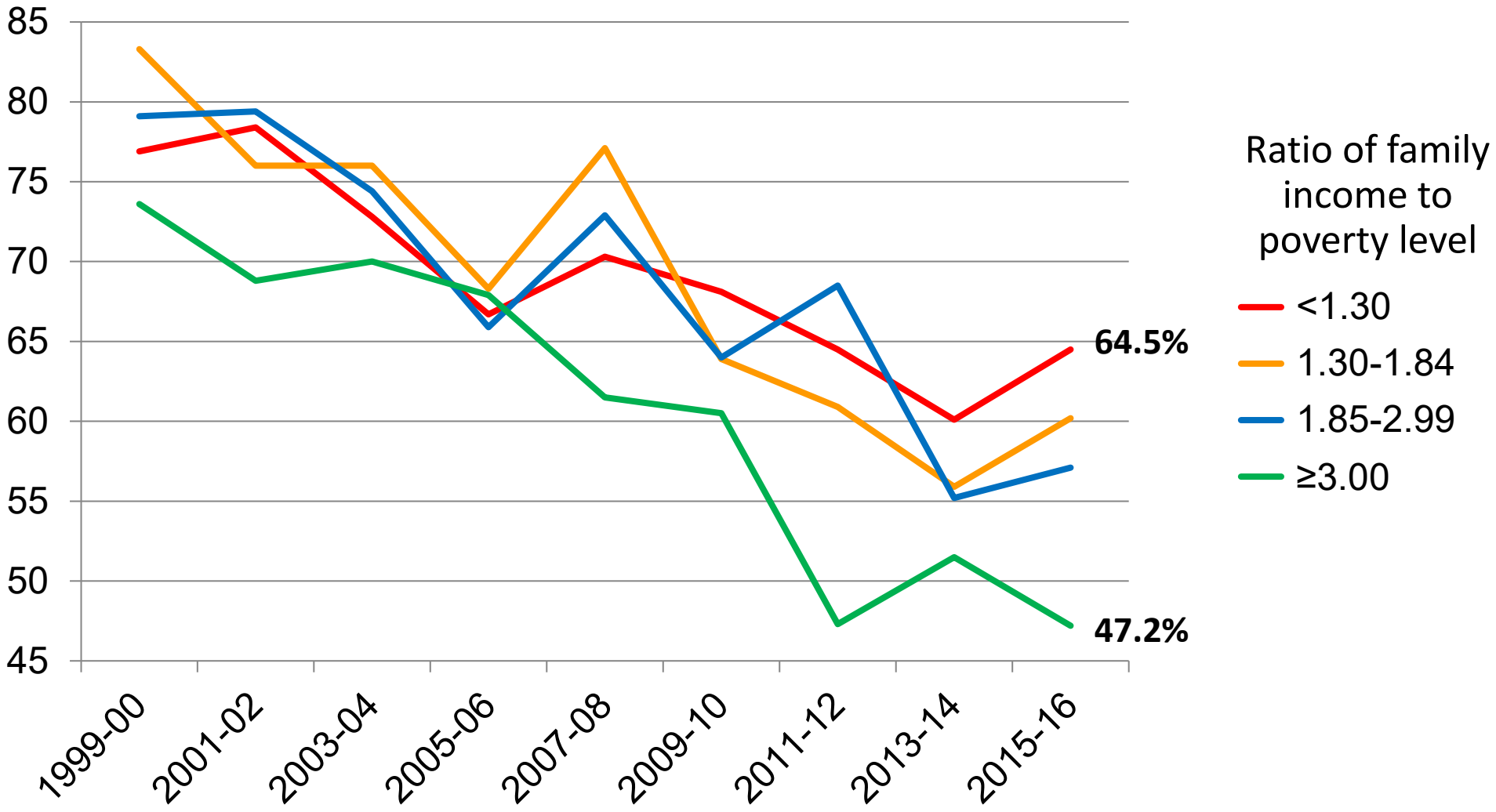
Trends in Dairy and Meats, US Children



Liu et al., JAMA 2020

Disparities in Nutrition, US Children

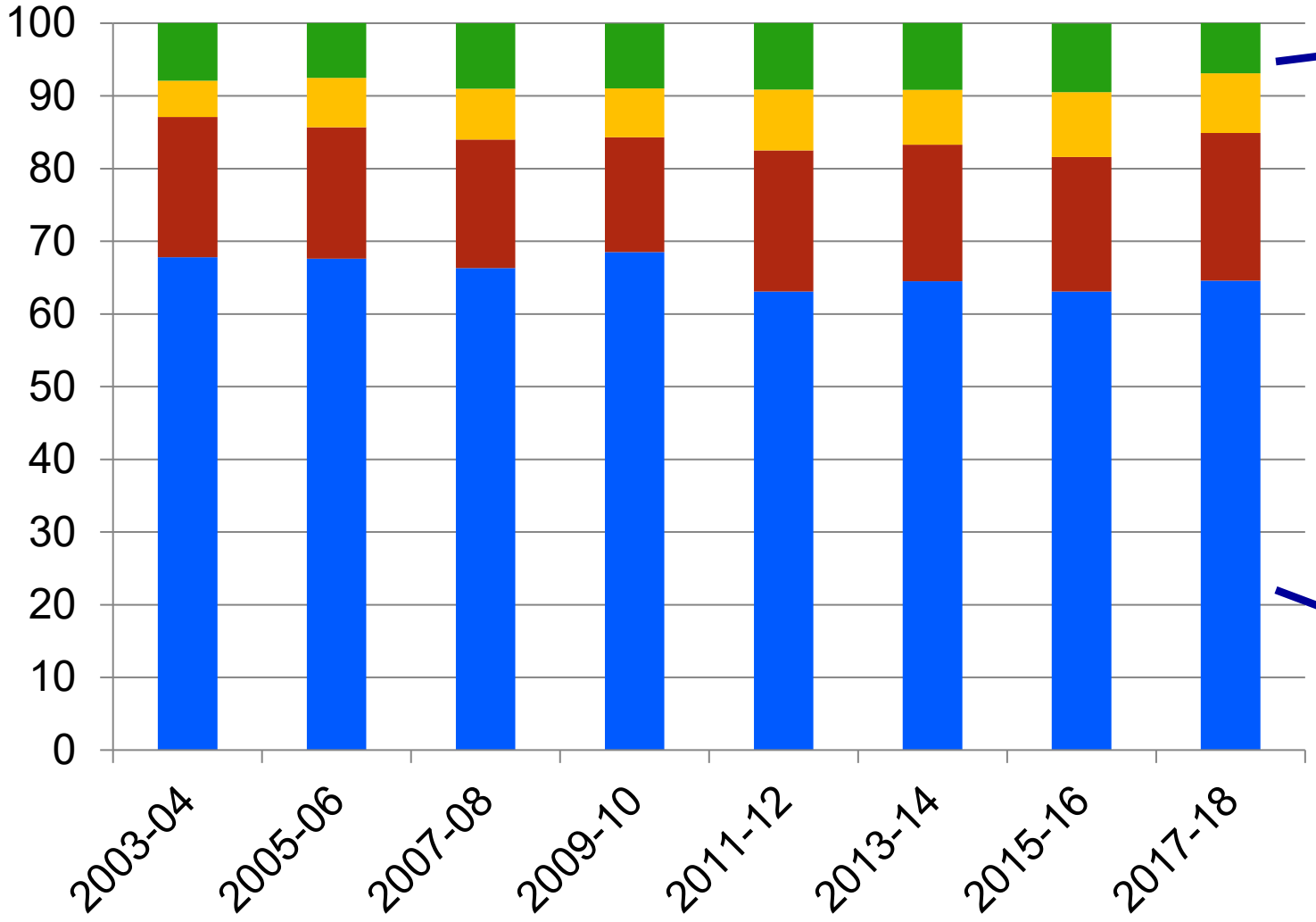
Percentage of U.S. children with a poor quality diet (AHA diet score)



Liu et al., JAMA 2020

Sources of Calories Among US Children

% of daily calories from different food sources



Schools: ~ 9% of calories year round

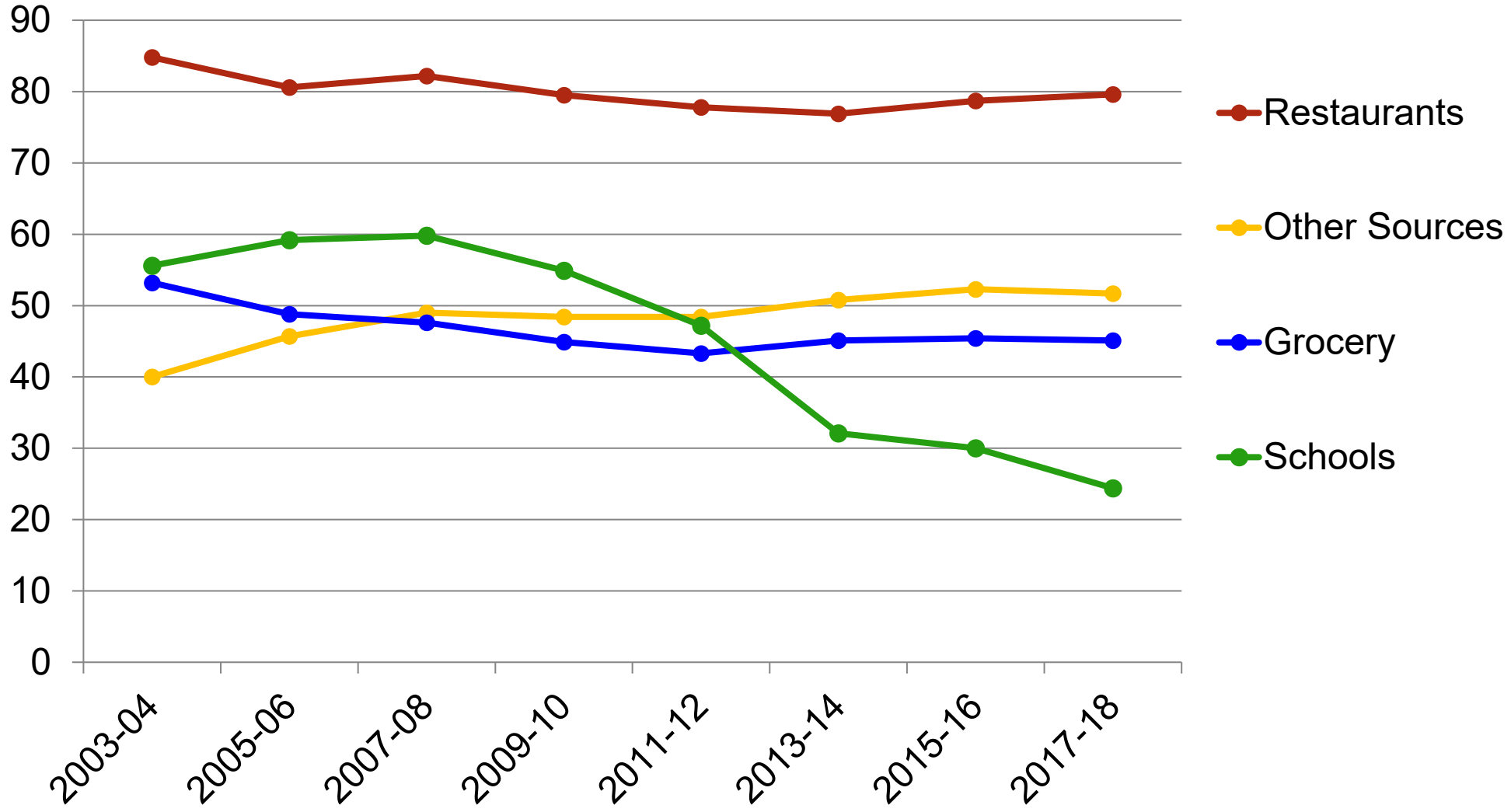
Grocery stores: ~ 65% of calories year round

Liu et al., JAMA Network Open 2021

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Nutritional Quality by Source, US Children

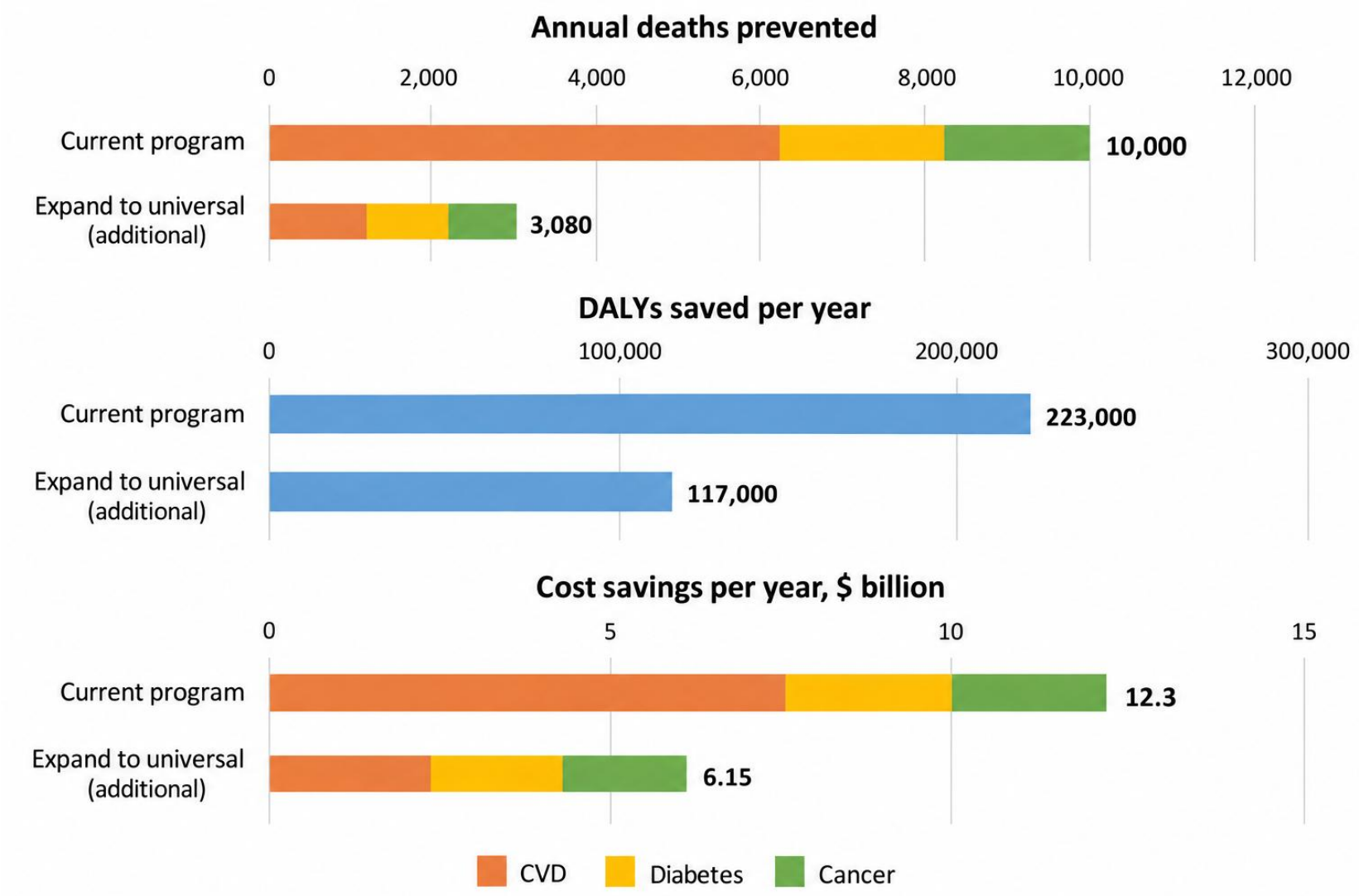
% of food with poor nutritional quality *



*Based on fewer fruits, vegetables, nuts, seeds, legumes, whole grains, fish, and more sugar-sweetened drinks, processed meats, saturated fat, salt

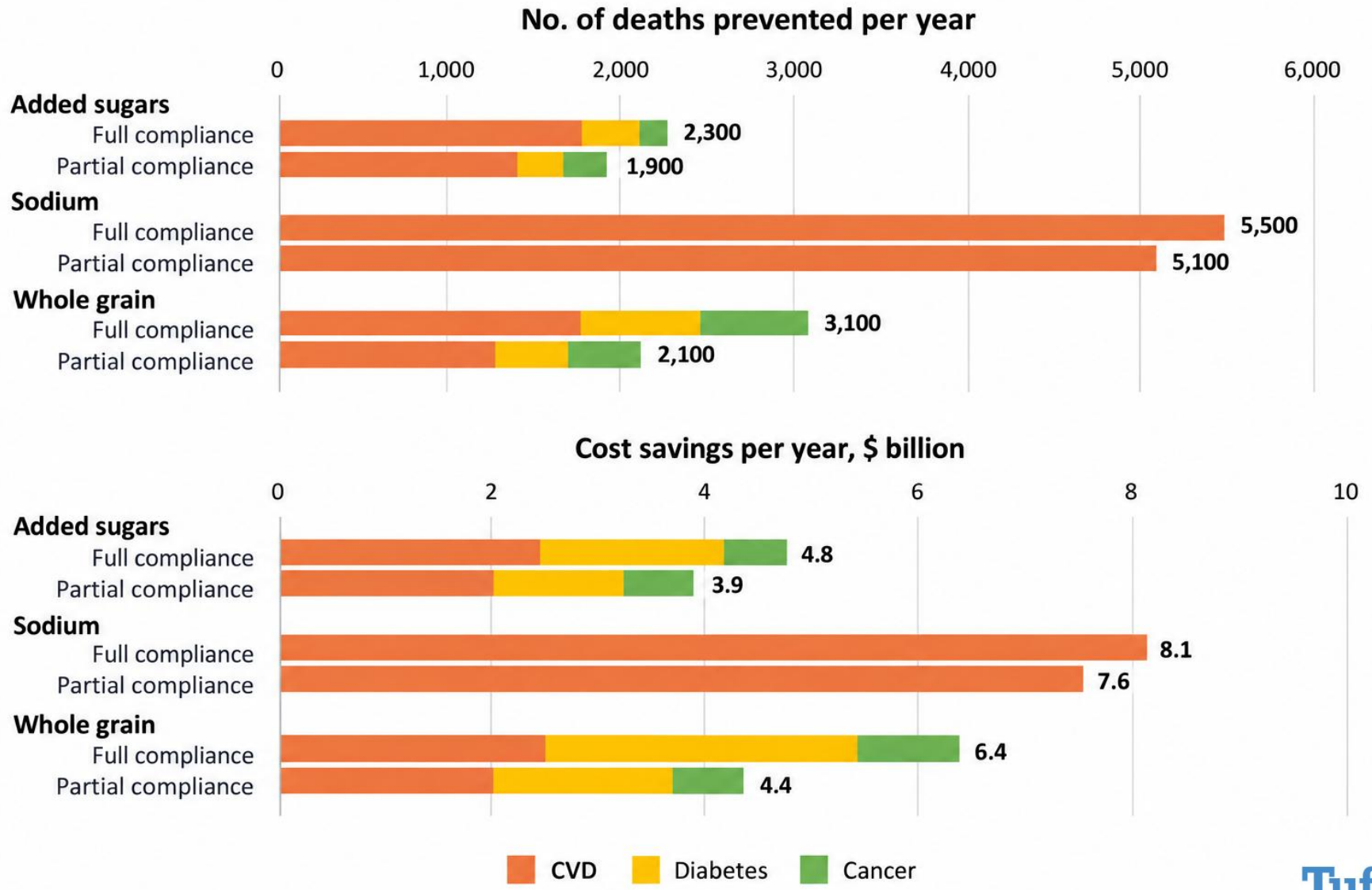
Liu et al., JAMA Network Open 2021

Health and Economic Benefits of School Meals



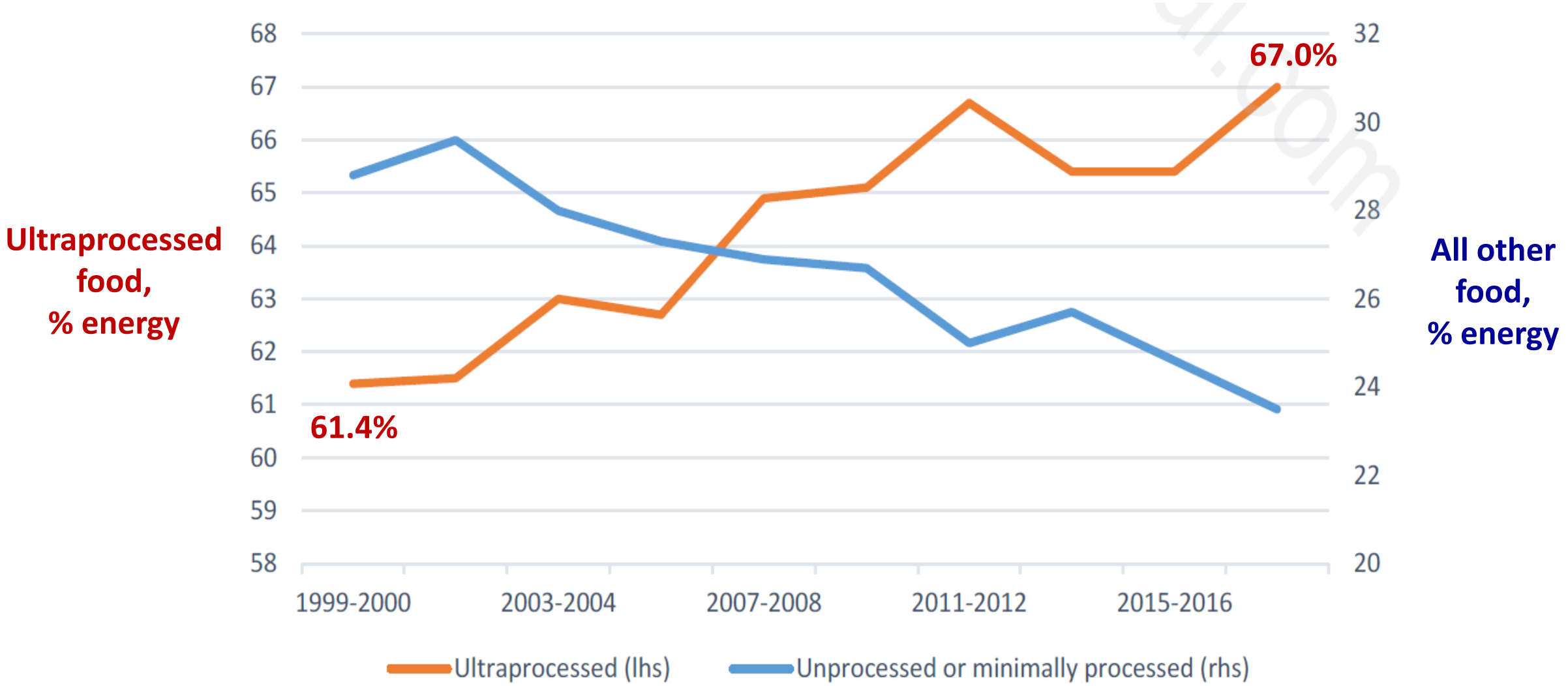
Wang et al., *submitted* 2026

Health and Economic Benefits of School Meals meeting the DGAs



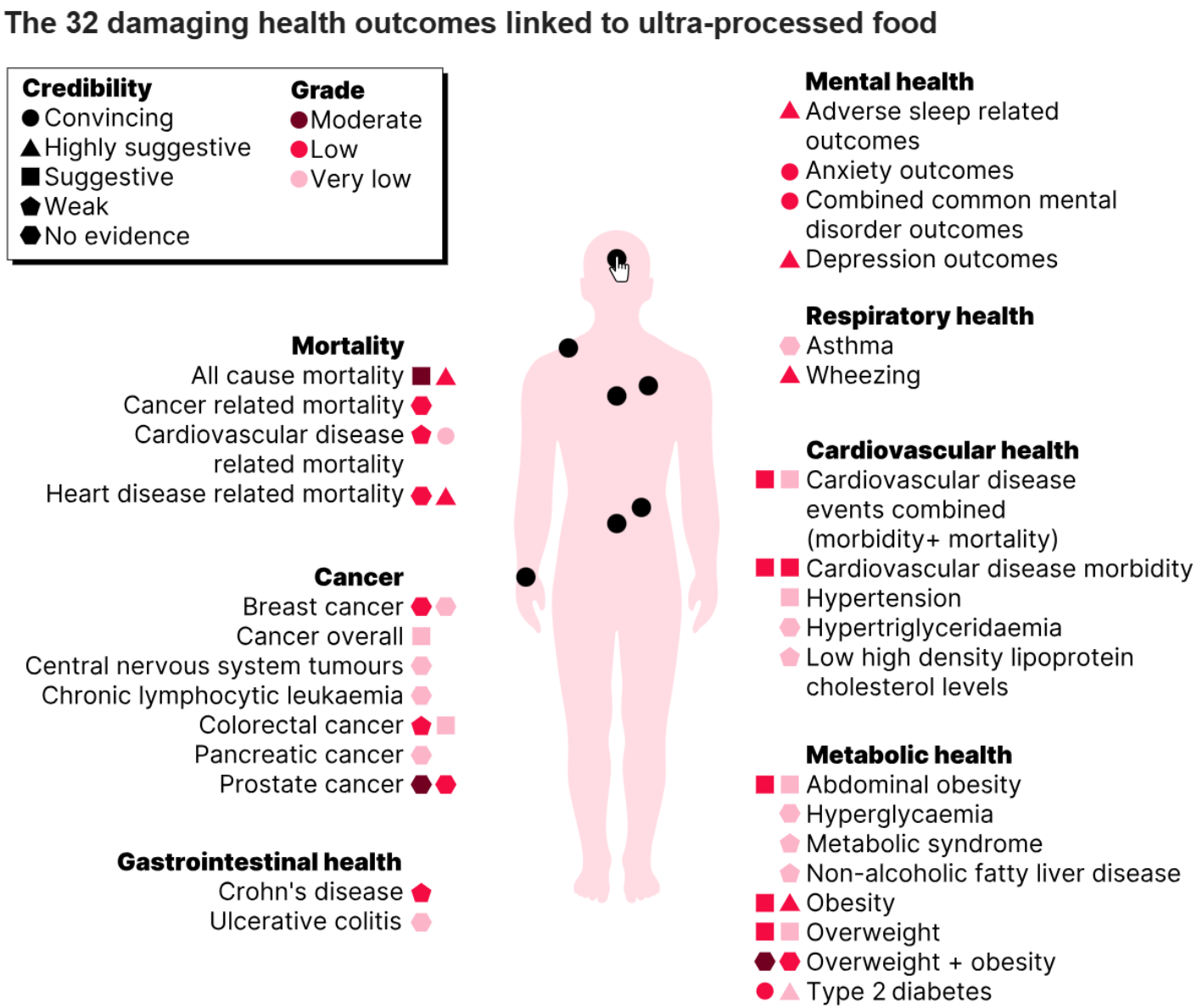
Wang et al., AJCN 2023

Trends in Ultraprocessed Food Intake, US Children



Credit Suisse, based on Wang et al., JAMA 2021

Ultraprocessed Foods and Health



Graphic by Daily Mail

Processed Meats and Health

Processed meats

Bacon, sausages, hot dogs, deli meats, ham, salami and other cured meats



Pro-inflammatory compounds

Nitrates/nitrites, advanced glycation end products (AGEs), heme iron, and other compounds can promote inflammation, oxidative stress, and insulin resistance.

Higher risk of type 2 diabetes



Type 2 diabetes

Carcinogenic compounds

Nitrates and nitrites can form N-nitroso compounds (NOCs) during processing and cooking, which are carcinogenic.

Higher risk of cancer
especially colorectal cancer



Colorectal cancer

Potential links to obesity and weight gain

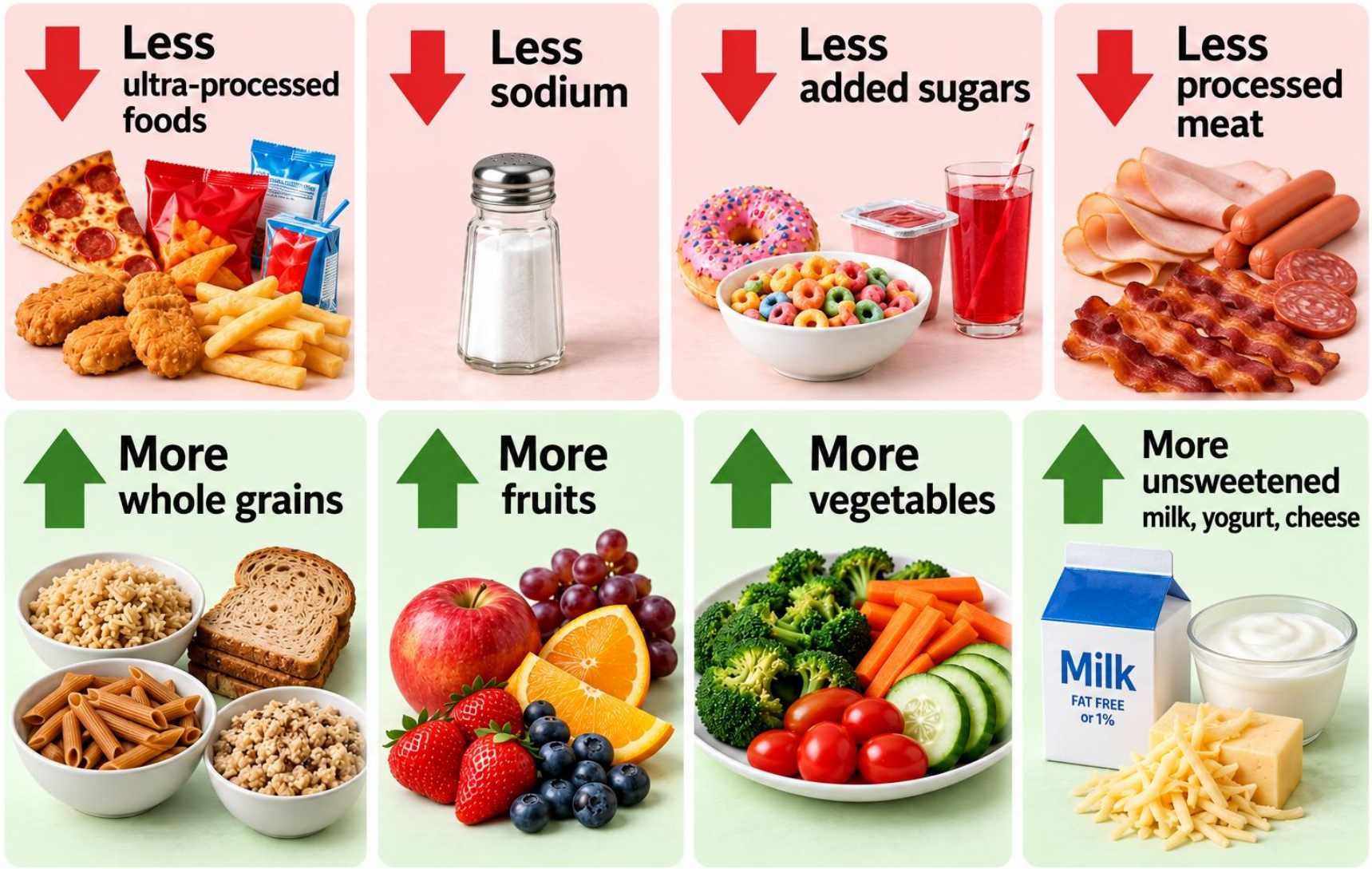
Processed meats may influence weight regulation through processing-related compounds and their effects on the gut microbiome, inflammation, or other mechanisms.



Overweight and obesity

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Nutritional Priorities for School Meals



Less sodium

Less added sugars

Less processed meat

More whole grains

More fruits

More vegetables

More unsweetened milk, yogurt, cheese

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