



Breakfast consumption, nutritional, health status, and academic performance among children

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- ✓ Prevalence of breakfast consumption
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- ✓ Barriers to breakfast consumption



Introduction

- **Consumption of breakfast is often considered as one of the most important health-related behaviours and there has been considerable research into its effects.**

What is Breakfast ?

- *Breakfast = first meal of the day*
- *The word “Breakfast” means breaking the fast.*



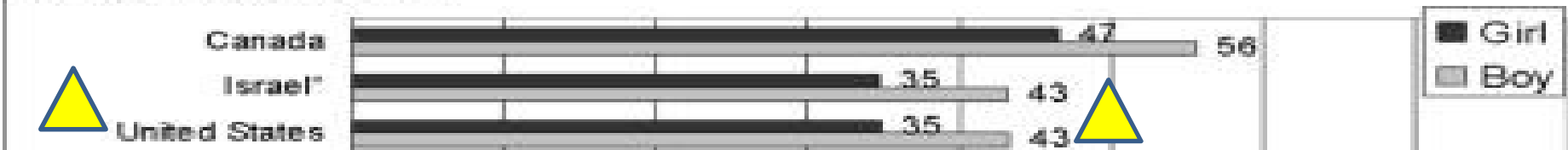


Prevalence of Breakfast consumption

- **Daily breakfast consumption among 11-, 13- and 15-year olds by country and gender (%)**
 - **Results from Breakfast consumption and its socio-demographic and lifestyle correlates in schoolchildren in 41 countries participating in the Health Behaviour in School-aged Children study (HBSC)**



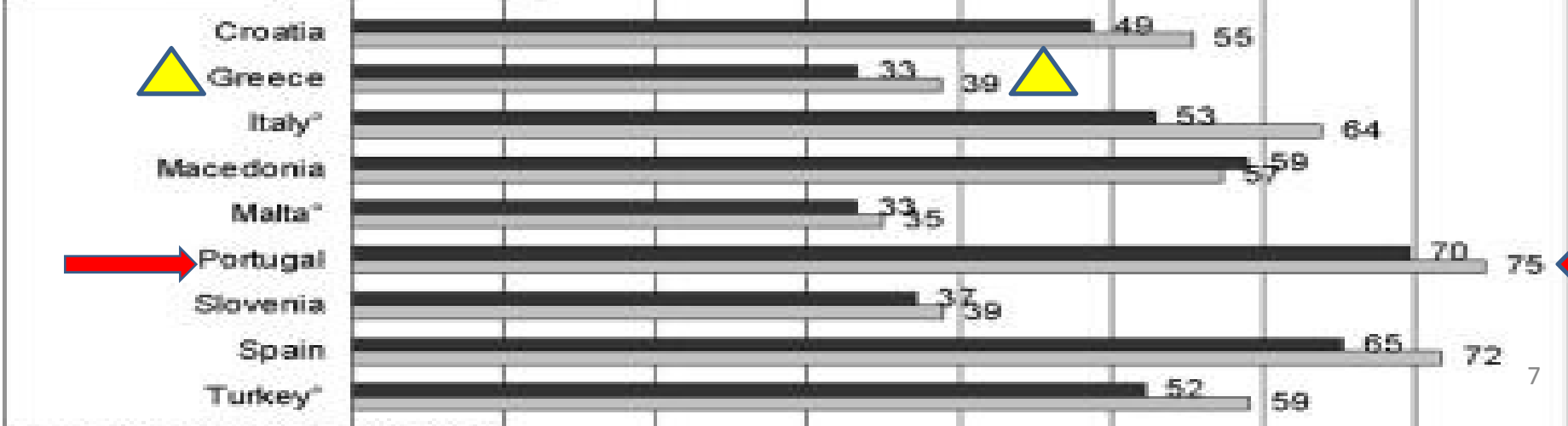
Non-European Countries

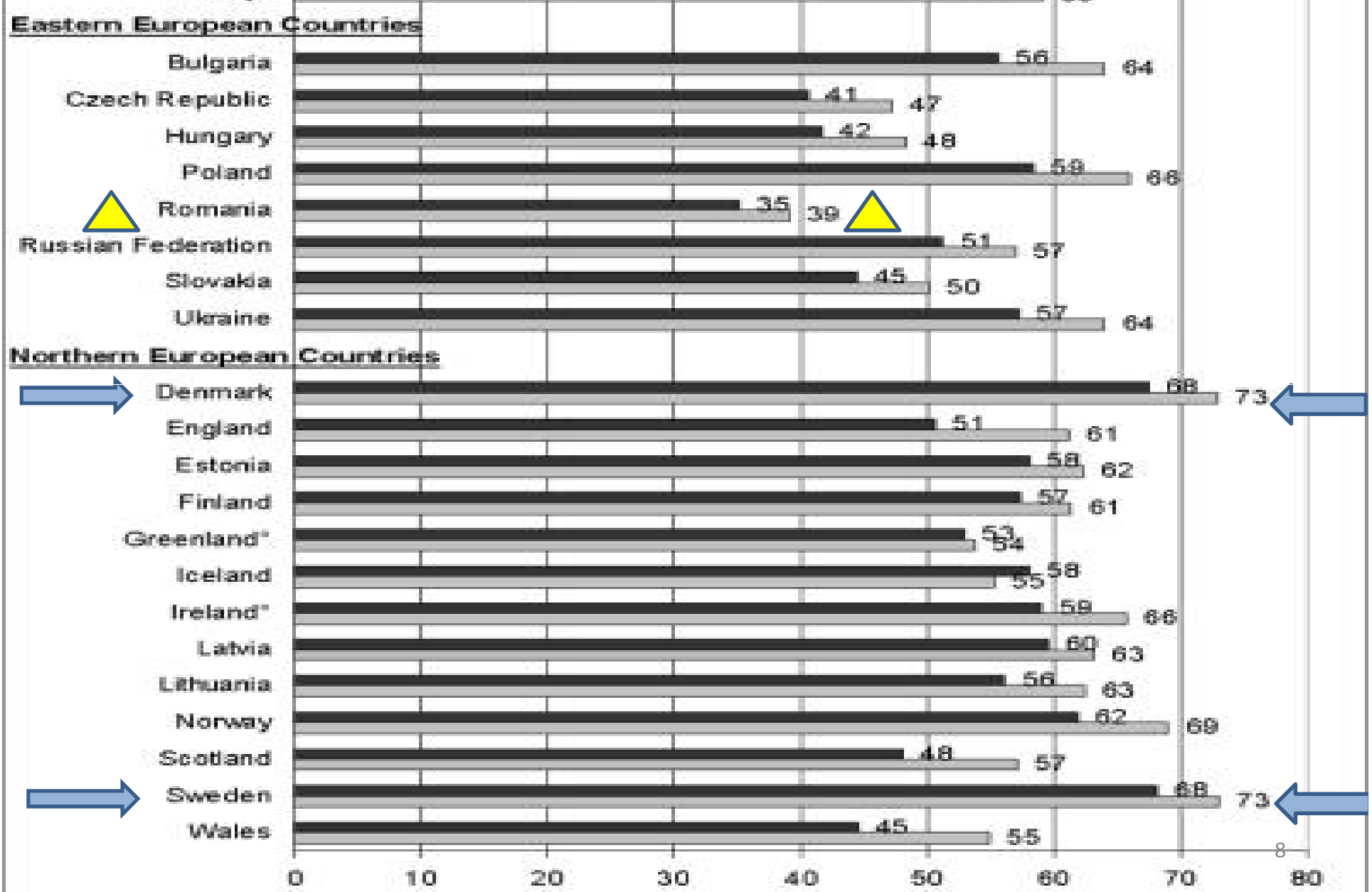


Central European Countries

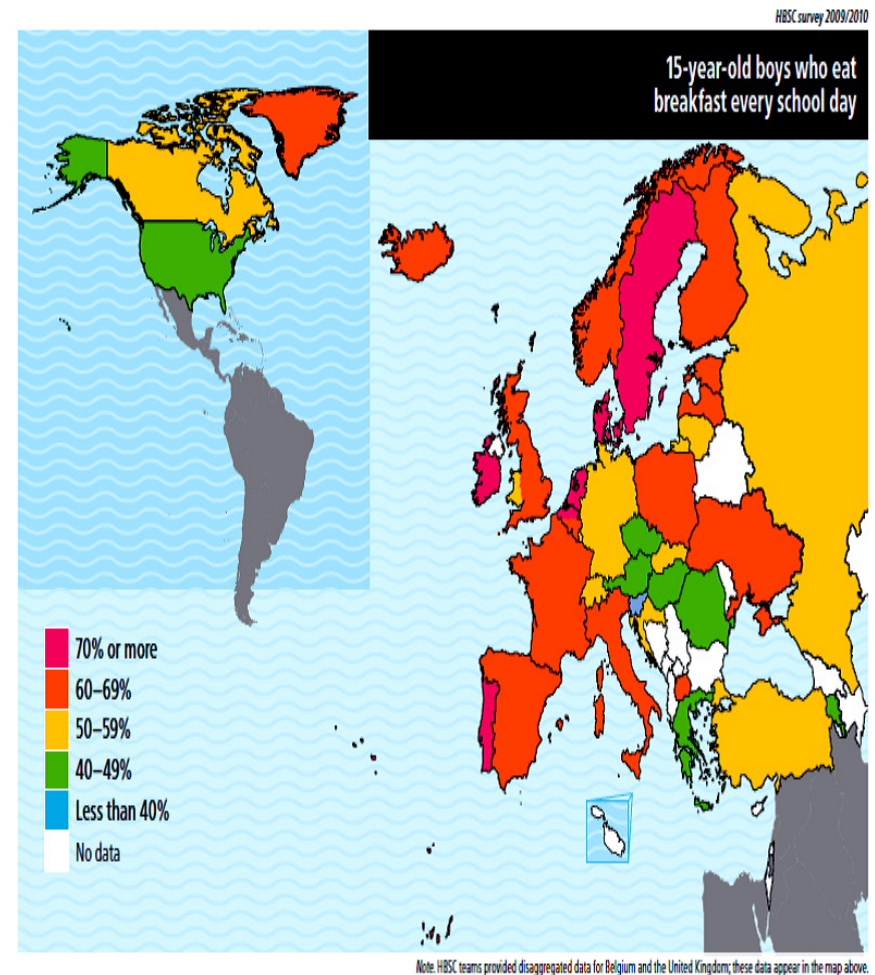
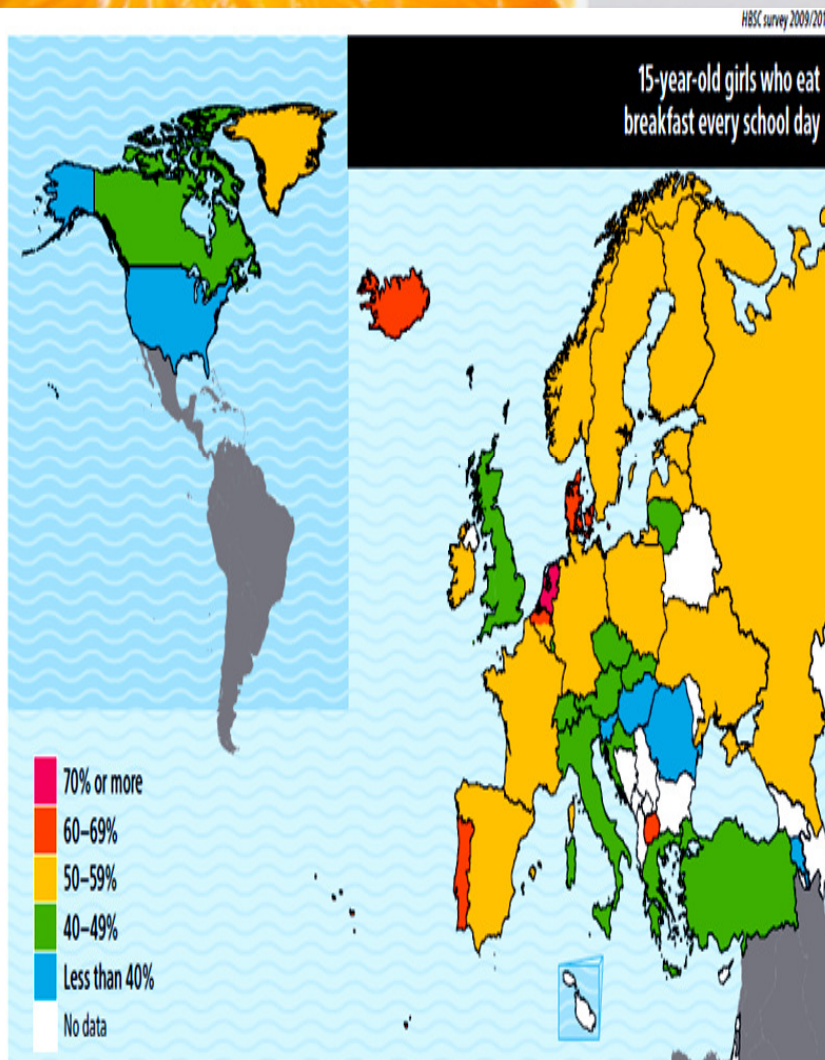


Southern European Countries



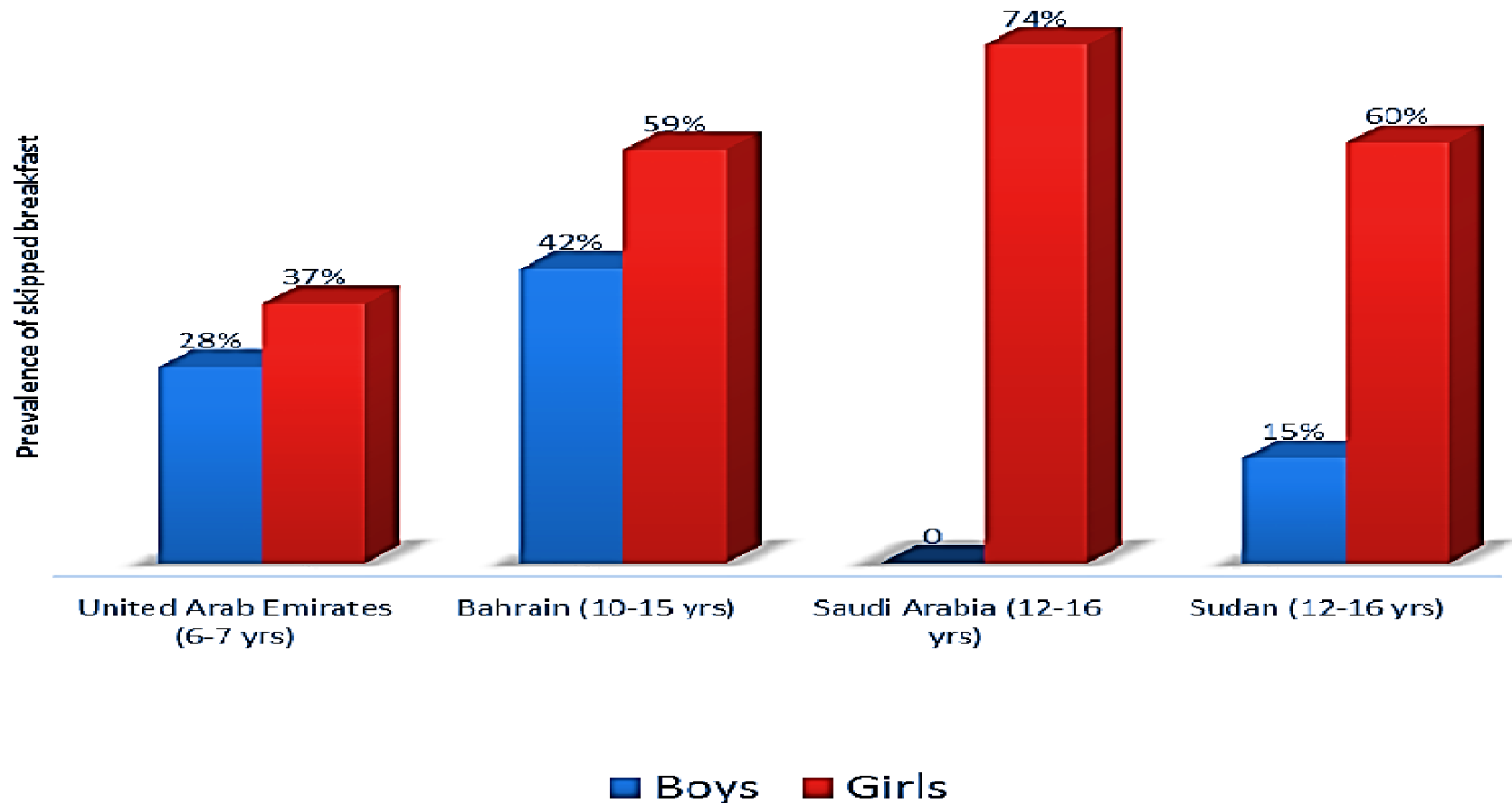


15 yrs old boys and girls who eat breakfast every school day





Prevalence of skipped breakfast in Eastern Mediterranean Region



Girls may be more likely to skip breakfast than boys, according to several surveys and studies (as indicated above)



THE
BREAKFAST
EFFECT



*Breakfast consumption and
Health benefits*



Benefits of a Nutritious Breakfast

- An important determinant of a healthful lifestyle is a nutritious breakfast, which:
 - influences the composition of subsequent meals,
 - regulates energy intake,
 - boosts physical activity levels,
 - and provides a crucial source of dietary micronutrients.



Immunity

Advantages of having breakfast

Memory



Fatigue





Benefits of a Nutritious Breakfast

- **There are several health benefits associated with the consumption of breakfast including improved bone health, reduced risk of coronary heart disease, lower fasting insulin, lower total cholesterol etc..**
- **In the current presentation, selected health benefits will be discussed**



Int J Public Health 54 (2009) S180–S190
1661-8556/09/0205180-11
DOI 10.1007/s00038-009-5409-5
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Original article

Breakfast consumption and its socio-demographic and lifestyle correlates in schoolchildren in 41 countries participating in the HBSC study

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Submitted: 18 September 2008; revised 04 May 2009; accepted: 04 June 2009

Published Online First 30 July 2009



Nutritional adequacy and breakfast consumption

- **In a research review of 47 studies which examined the association between breakfast consumption and several health-related factors such as nutritional adequacy in children and adolescents it was found:**
 - **that breakfast eaters have higher daily intakes of fibre, calcium, vitamin A, vitamin C, riboflavin, zinc, and iron**
 - **and are more likely to meet nutrient intake recommendations compared to breakfast skippers.**




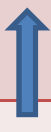
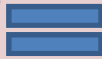















Nutritional adequacy and breakfast consumption

- **Similar findings were reported in Sudan, where the mean intake of energy, Ca, Fe, Zn, vitamin A, vitamin B₁₂ and folate among children who took their breakfast in school was higher than the breakfast skippers**
- **in an adolescent population the intake of added sugars was higher in breakfast skippers than breakfast consumers.**



Energy and nutrient consumption by breakfast skippers in Sudan

Nutrients	Mean ± sd		
	6-7 yrs	8-9 yrs	10-11 yrs
Energy (kcal)	1751±274 	1418±531 	1753±20 
Ca(mg)	809±181 	699±325 	432±45 
Fe(mg)	15±7 	12±6 	10±2 
Vitamin A(µg)	202±131 	157±125 	811±737 
Vitamin B ₁₂ (µg)	129±56 	132±163 	294±410 
Folate(µg)	165±37 	163±66 	278±85 ¹⁸ 



Breakfast consumption and Health benefits

- **Skipping breakfast is also associated with a variety of detrimental outcomes in other studies including:**
 - **dental caries,**
 - **dysmenorrhoea**
 - **and reduced weight control**



Breakfast consumption and Health benefits

- **Skipping breakfast is often coupled with various other unhealthy behaviours.**
- **Adolescents who skip breakfast also tend to indulge in several less healthful dietary behaviours such as increased snacking, irregular eating patterns, and increased intake of low-nutritive-value foods**



Breakfast consumption and Health benefits

- **Those who skip breakfast are also significantly less likely to eat the recommended two servings of fruit or five servings of fruits and vegetables a day and are more likely to omit other meals during the day, which may lead to inadequate energy intakes**



Breakfast consumption and Health benefits

- **Breakfast skipping in adolescents is associated with an increased likelihood to smoke, drink alcohol frequently, and use more coffee and caffeinated sodas than regular breakfast eaters**





ORIGINAL ARTICLE

Associations of breakfast skipping with obesity and health-related quality of life: evidence from a national survey in Taiwan

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Objective: This study investigated the associations of breakfast skipping with obesity and health-related quality of life (QOL). We also tested the hypothesis that there is a dose-dependent relationship between frequency of breakfast consumption and prevalence of obesity.

Subjects and Design: This cross-section study used a national representative sample ($n=15\,340$) from the 2005 Taiwan National Health Interview Survey. Breakfast skippers were defined as those who ate breakfast about once a week or less often and those who never ate breakfast. Individuals were classified as 'obese' if their body mass index was ≥ 27 . Health-related QOL was assessed using the Medical Outcome Studies 36-Item Short-Form (SF-36) Health Survey. Logistic regression was used to examine the odds ratio of obesity and associated 95% confidence intervals (CIs) in breakfast skippers compared with breakfast eaters. Multivariable logistic regression modeling was used to adjust all risk estimates for covariates.

Results: The unadjusted odds ratio of obesity in breakfast skippers was 1.23 (95% CI: 1.06, 1.43). The odds of developing obesity for breakfast skippers was 1.34 (95% CI: 1.15, 1.56) controlling for age, sex, marital status, educational level, monthly income, smoking, alcohol, betel nut chewing and exercise habit. The Cochran–Armitage trend test revealed that the prevalence rate of obesity decreased as the frequency of breakfast consumption increased ($P=0.005$). Breakfast skippers had significantly worse health-related QOL than breakfast eaters ($P<0.001$). Moreover, breakfast skippers had significantly lower scores in 5 out of 8 domain scores of the SF-36, namely general health perceptions ($P<0.001$), vitality ($P<0.001$), social functioning ($P=0.036$), emotional role ($P<0.001$) and mental health ($P<0.001$).

Conclusion: The findings from this study add support to the potential role of breakfast eating in obesity prevention.

International Journal of Obesity (2010) 34, 720–725; doi:10.1038/ijo.2009.285; published online 12 January 2010



Breakfast consumption and body weight

- **Numerous observational studies have examined the relationship between breakfast consumption patterns (including frequency and content of breakfast) and body weight and/or body mass index (BMI) in children and adolescents**



Breakfast consumption and body weight

- **Eating breakfast may help prevent weight gain**
- **Studies have also shown that what is actually consumed at breakfast has an effect on the body.**
- **For example, eating cereal or breads for breakfast has been associated with a significantly lower BMI when compared to those who skip breakfast or consume meat and/or eggs for breakfast**



Breakfast consumption and body weight

- **Breakfasts that include ready to eat cereal have been shown to provide more fibre, iron, folic acid, and zinc as well as less fat, sodium, sugar, and cholesterol when compared to non cereal breakfasts**
- **The inclusion of breakfast cereals can also facilitate the consumption of other nutritious foods at breakfast, and displace unhealthy foods such as fats/sweets & meat/eggs**



Breakfast consumption and body weight

- The main reasons that have been proposed to explain why breakfast skipping is associated with a decreased ability to lose weight have a focus on the assumption that *breakfast skipping can lead to over eating later in the day*



U.S. Department
of Agriculture

Center for
Nutrition Policy
and Promotion

November 2011

Breakfast Consumption, Body Weight, and Nutrient Intake: A Review of the Evidence

Nutrition Insight 45

BACKGROUND

Maintaining a healthy body weight and meeting nutrient requirements are vital to maintaining good health. However, many Americans are overweight or obese, indicating that they consume more calories from foods and beverages than they expend through normal bodily function and physical activity. In addition, many Americans consume too few vegetables, fruits, whole grains, milk and milk products, and oils, which results in inadequate intake of a number of nutrients, including potassium, dietary fiber, calcium, and vitamin D.

A growing body of research has investigated the impact of eating behaviors, such as consuming breakfast, on body weight, as well as nutrient intakes. This *Nutrition Insight* provides an overview of the systematic evidence-based reviews on the relationship between breakfast intake and (1) body weight and (2) nutrient intakes conducted by the 2010 Dietary Guidelines Advisory Committee (DAC) and the

USDA NUTRITION EVIDENCE LIBRARY

The USDA Nutrition Evidence Library (NEL) specializes in conducting systematic reviews to inform Federal nutrition policy and programs. The Library is a key resource for making food and nutrition research accessible to all Americans.

www.NEL.gov

Children

The review in children identified 15 studies: 1 randomized controlled trial (RCT), 1 non-RCT, and 13 prospective cohort studies. Thirteen studies were given a positive quality rating, and two were rated neutral.

Eleven studies found that breakfast intake was associated with lower body weight in children.

- Five studies found the association in all subjects.



Growing Up Today Study (GUTS)

- At baseline, children who never ate breakfast were heavier and more likely to be overweight than children who ate breakfast more consistently.
- However, over the first year, overweight children who skipped breakfast had smaller BMI increases than overweight children who ate breakfast daily.
- Normal weight children who skipped breakfast tended to have greater BMI increases compared to breakfast eaters, although the finding was not statistically significant



Breakfast consumption and academic performance



BREAKFAST
in the classroom





Is breakfast consumption related to mental distress and academic performance in adolescents?

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Submitted 14 March 2006; Accepted 25 July 2006

Abstract

Objective: To examine the relationship between mental distress, academic performance and regular breakfast consumption across gender and immigration status.

Design: Cross-sectional population-based study. Two four-page questionnaires were filled in during two school sessions.

Setting: All junior high schools in Oslo, Norway using the classroom as the setting for the study.

Subjects: All 10th grade students 15–16 years olds in 2000 and 2001. Of 8316 eligible students, 7343 (88.3%) participated in the study.

Results: All immigrant groups, except the Western countries group, are skipping breakfast more often than Norwegian students, and girls more often than boys (27 versus 19%). After adjustment for possible confounding factors, the odds ratio (OR) for being mentally distressed when eating breakfast seldom/never compared with every day was 3.0 (2.0–4.5) for boys, 1.6 (1.2–2.1) for girls and 1.6 (1.5–2.6) for the immigrant group. The comparable OR for having low school grades was similar for boys and girls, 2.0 (1.3–3.0), and 1.6 (1.5–2.6) for the immigrant groups.

Conclusions: Skipping breakfast is a common feature among 10th grade students. The implications of skipping breakfast on mental distress and academic performance are stronger for boys than girls and stronger for Norwegians compared with immigrants.

Keywords
Adolescence
Breakfast
Mental health
Academic performance
Immigration



Breakfast consumption and academic performance

- A review of 22 studies related to breakfast consumption and academic performance in children and adolescents suggests that eating breakfast may help children do better in school by *improving memory, test grades, school attendance, psychosocial function, and mood.*
- Breakfast may particularly benefit children at nutritional risk



Breakfast consumption and academic performance

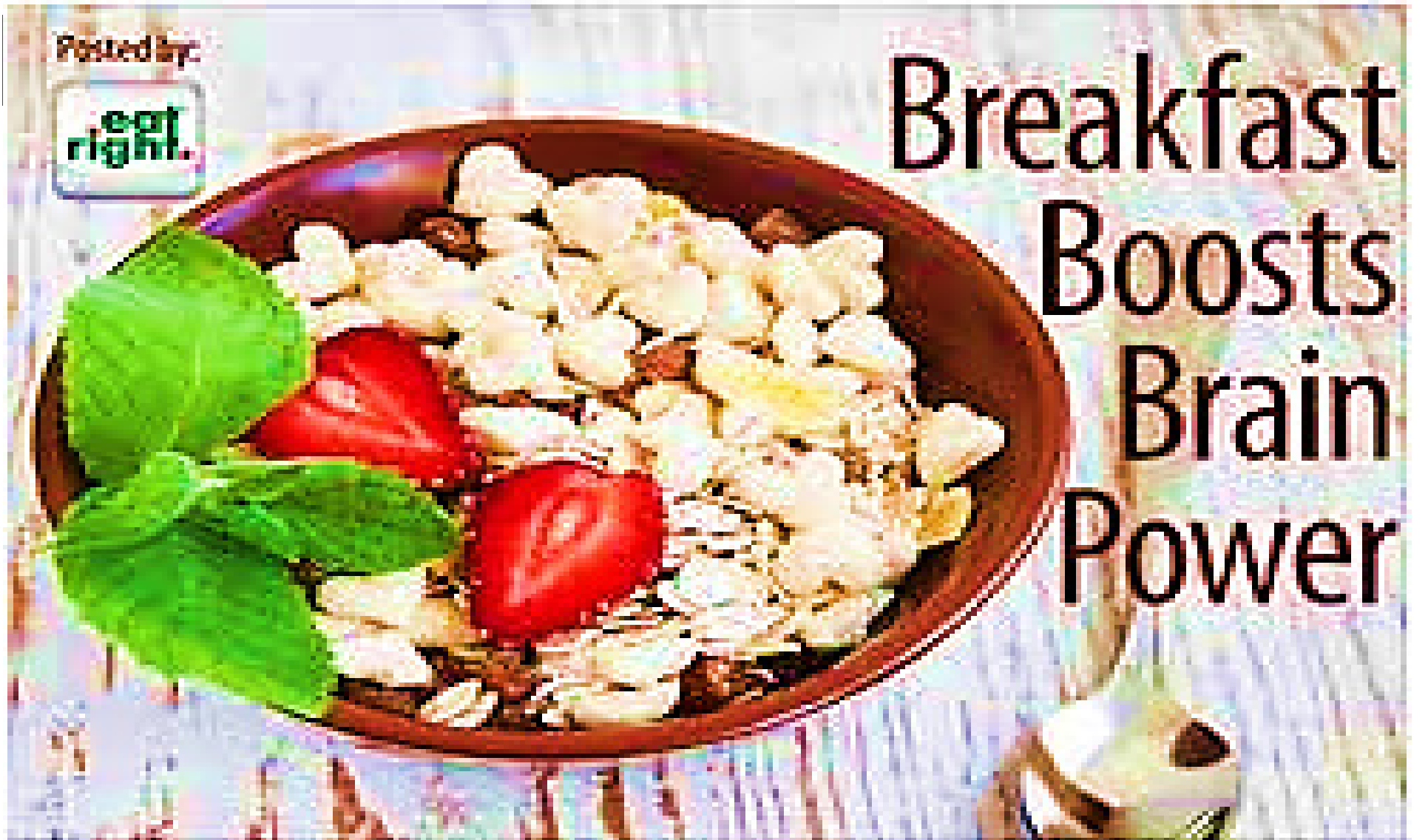
- **Numerous observational studies also showed that eating breakfast has a beneficial effect on academic and achievement school attendance, and tardiness rates**
- **In Saudi Arabia, students who consumed breakfast, performed well in their Science, Mathematics and English**
- **Similar findings were reported in Sudan**



Posted by:



Breakfast Boosts Brain Power





Breakfast consumption and memory function

- **In some experimental studies, eating breakfast was positively associated with several aspects of short-term memory function for various age groups and types of tests.**
- **Specifically, benefits have been reported for recall and episodic memory**



Breakfast consumption and stress

- **Studies suggest that a short fasting may impose greater stress on young children than on adults, resulting in metabolic alterations as various homeostatic mechanisms work to maintain circulating glucose concentrations.**

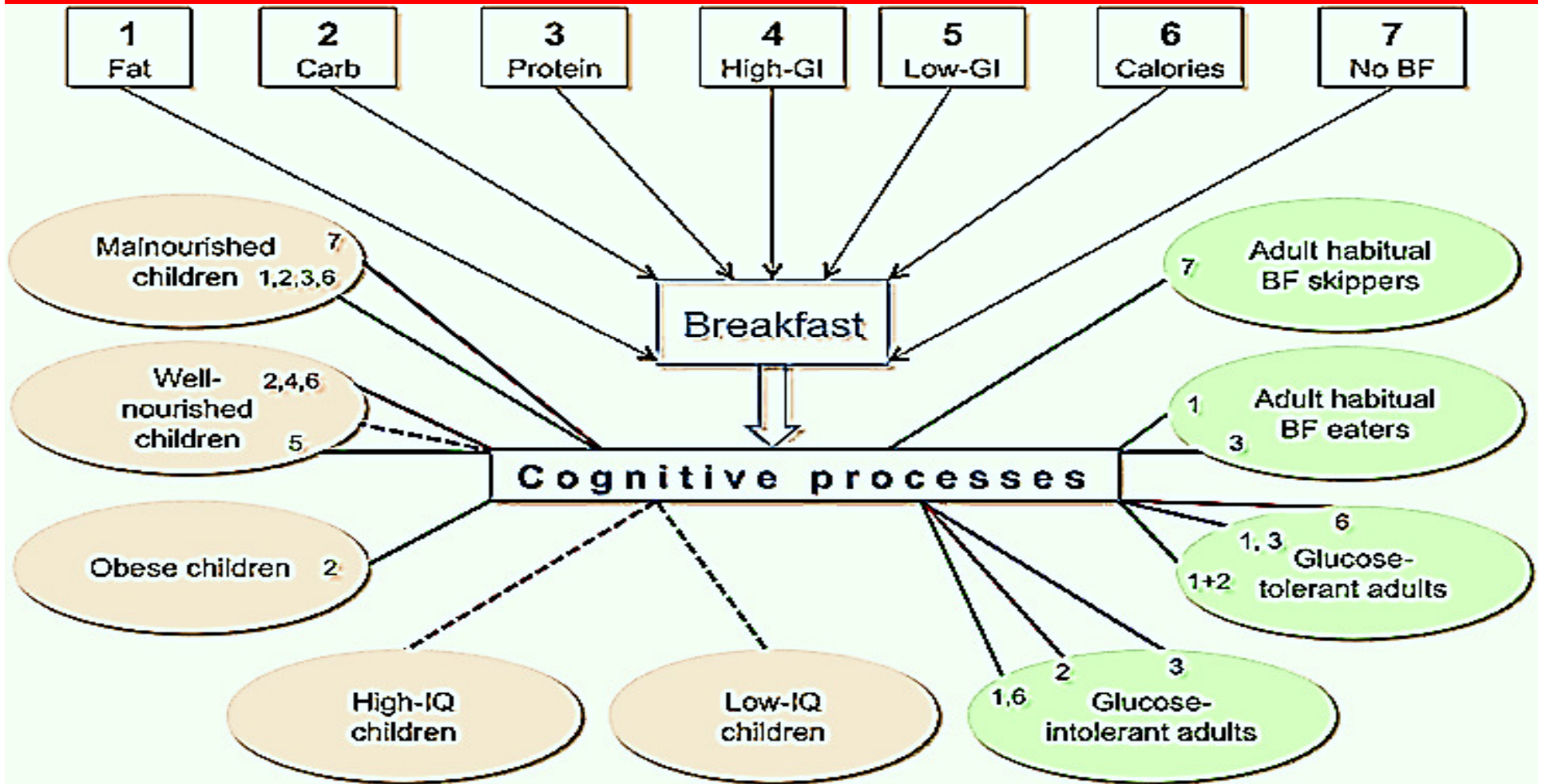


Breakfast consumption and stress

- **Research has also suggested that individuals who consume a cereal breakfast each day are:**
 - **less depressed,**
 - **less emotionally distressed**
 - **and have lower levels of perceived stress than those who did not eat breakfast each day**



Breakfast and cognitive process



— Positive influence; — No influence; GI: glycemic index; BF: breakfast; Carb: carbohydrates
 — Negative influence; Dashed lines: BF versus NO-BF, unspecified nutritional composition



Breakfast consumption and cognitive performance

- **Theoretically, two biological mechanisms by which breakfast may affect brain function and cognitive test performance have been suggested.**
- **The first involves metabolic changes associated with an overnight fast to maintain the availability of energy and nutrients to the central nervous system**
- **The other involves the long-term beneficial effects that breakfast may have on overall nutrient intake and nutritional status, which could consequently affect cognition**



RESEARCH

Review



*Continuing Education Questionnaire, page 761
Meets Learning Need Codes 3020, 4000, 4150, and 5070*

Breakfast Habits, Nutritional Status, Body Weight, and Academic Performance in Children and Adolescents

GAIL C. RAMPERSAUD, MS, RD; MARK A. PEREIRA, PhD; BEVERLY L. GIRARD, MBA, MS, RD; JUDI ADAMS, MS, RD;
JORDAN D. METZL, MD

ABSTRACT

Breakfast has been labeled the most important meal of the day, but are there data to support this claim? We summarized the results of 47 studies examining the association of breakfast consumption with nutritional adequacy (nine studies), body weight (16 studies), and academic performance (22 studies) in children and adolescents. Breakfast skipping is highly prevalent in the United States and Europe (10% to 30%), depending on age group, population, and definition. Although the quality of breakfast was variable within and between studies, children who reported eating breakfast on a consistent basis tended to have superior nutritional profiles than their breakfast-skipping peers. Breakfast eaters gener-

ally consumed more daily calories yet were less likely to be overweight, although not all studies associated breakfast skipping with overweight. Evidence suggests that breakfast consumption may improve cognitive function related to memory, test grades, and school attendance. Breakfast as part of a healthful diet and lifestyle can positively impact children's health and well-being. Parents should be encouraged to provide breakfast for their children or explore the availability of a school breakfast program. We advocate consumption of a healthful breakfast on a daily basis consisting of a variety of foods, especially high-fiber and nutrient-rich whole grains, fruits, and dairy products.

J Am Diet Assoc. 2005;105:743-760.



Reasons for Skipping breakfast

- ✓ **School pressure**
 - ✓ **Habit**
 - ✓ **Unable to prepare**
 - ✓ **Away from family**
 - ✓ **Lack of time**

- ✓ **Getting up late for school**
 - ✓ **Usually not hungry**
 - ✓ **Follow a special dietary regimen**
 - ✓ **Food not available**

- ✓ **Low SES**
- ✓ **Cultural habits**
 - ✓ **Parental education**
 - ✓ **Parental occupation**



Factors associated with breakfast skipping

- **Different other factors are also related to breakfast skipping including:**
 - **age (older children more likely skip breakfast),**
 - **gender (girls skip breakfast more often than boys),**
 - **whether parents have breakfast (positive effect),**
 - **and chronotype (breakfast skippers were more often evening chronotypes).**



Factors associated with breakfast skipping

- **Children who go without breakfast may do so because of hectic morning schedules.**
- **Parents may lack time to prepare a nutritious breakfast for their children because of early-morning school bus schedules, long commutes to jobs, and non-traditional work hours.**
- **Adolescents from single parent are more likely to skip breakfast**



Factors associated with breakfast skipping

- Increased autonomy during adolescence, when breakfast-skipping rises sharply, may play a role in breakfast choices**
- In one study, adolescents allowed to make their own decisions about what they ate were 25 percent more likely to skip breakfast**



Conclusion

- **Understanding the above factors can help communicators formulate appropriate strategies that encourage more people to reap the benefits of a healthful breakfast.**
- **Implementation of the School Breakfast Program decreased the number of breakfast skippers from 30% to 13%.**



Thank you for your time

