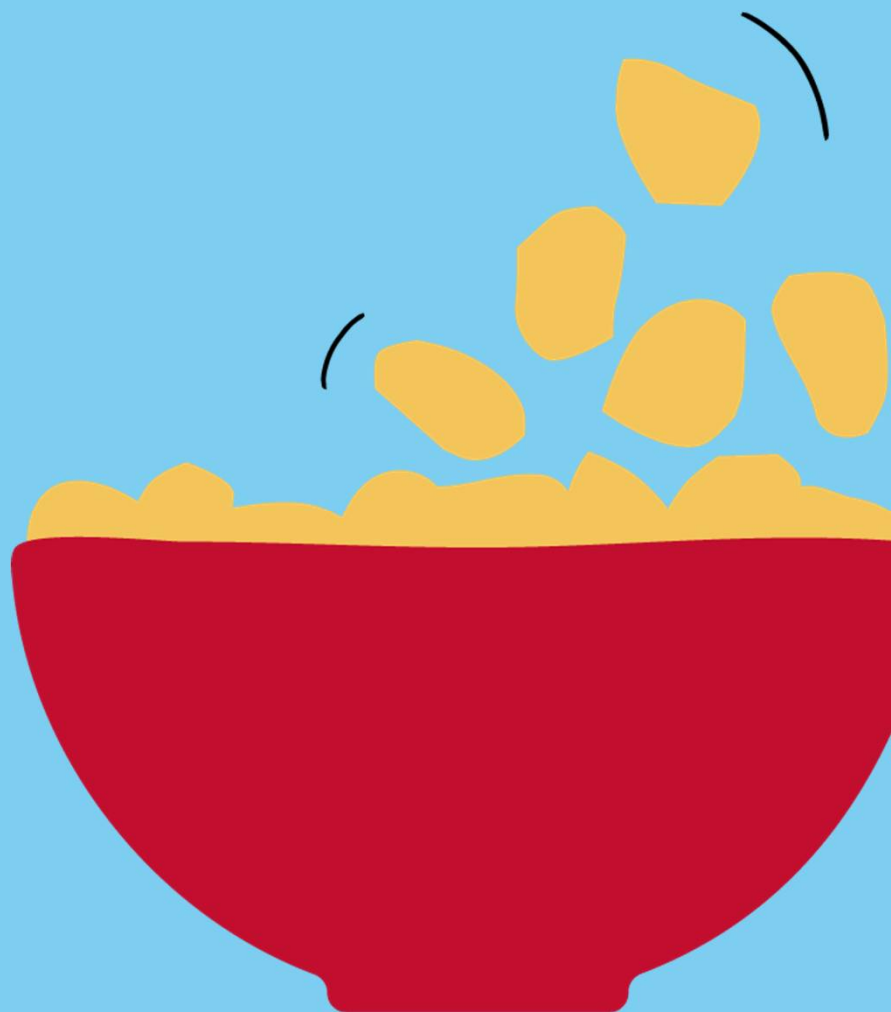




SCHOOL BREAKFAST PROGRAMS: A REVIEW OF THE RESEARCH AND KEY DEVELOPMENTS OVER TIME

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METHODOLOGY

Kasvisto, a behavioral science and research practice, undertook a review of the literature related to the evolution of breakfast programs for Kellogg. This work was funded by Kellogg Company Fund. The countries covered included: Australia, Canada, Germany, Guatemala, India, Ireland, Mexico, South Africa, Spain, U.K. and the U.S.*

COVID-19 has had a significant impact on breakfast programs as many schools have closed for extended periods of time. In their working paper [*COVID-19: Missing More Than a Classroom. The impact of school closures on children's nutrition*](#), UNICEF discusses the scale of food insecurity, how it has risen during the pandemic particularly in developing markets and highlights the long- and short-term implications for nutrition among the 370 million children globally who benefit from such programs. The extent of the disruption will lead to an increased number of stunted children, more children with lowered immune systems and generally poorer health. They suggest several adaptations to the process of getting food to children such as take-home rations, cash transfers or vouchers and multi-modal approaches (where central and local government coordinate). Similarly, to facilitate a safe return to breakfast programs, they suggest enhanced hygiene protocols, full training for staff involved and a focus on improving both dietary content and the delivery process.

Breakfast programs have become a key intervention within schools all over the world. Early programs in countries from Brazil to the U.S. were designed to improve health outcomes for children. In recent years, these programs have evolved to focus on improving education and even social outcomes for children, their families and the wider community.

* Because the research in each country is varied, not all countries have been researched to the same depth or in the same way.

The research and aims of breakfast programs have shifted over time. Three main themes emerged from this review:

1. Health and nutrition effects. Over the decades, breakfast programs have looked at the effects of good nutrition on malnourished and low-socio-economic status children. Today, most countries are dealing with the issues of malnutrition as well as obesity, along with poor mental wellbeing.
2. Cognitive effects. From developing countries like Africa to more developed countries, there is strong evidence to suggest that eating a regular and balanced breakfast can influence children's concentration, memory, task focus, and to a lesser extent, academic results.
3. Social impacts. There has been a recent focus on researching this area and useful and important early evidence is emerging. Early results indicate that children who attend breakfast programs, display fewer "bad behaviors," benefit from positive role modelling of "good behaviors" and attend school more frequently. The role of families, food education and the impact of these programs on the wider community also have been explored, with positive early results. It is here that this review will begin, before addressing the other themes.



SOCIAL IMPACT ON THE CHILDREN WHO EAT BREAKFAST IS THE NEWEST AREA OF STUDY FOR SCHOOL BREAKFAST PROGRAMS

In recent years, researchers have broadened the focus of studies to consider potential social effects of eating a good breakfast. A review by Adolphus et al, (2020) brings together a current and useful summary of the social impact of breakfast programs in the U.K. and highlights most of the key areas of interest. Many meal programs such as those in Brazil have been designed to bring together parents, students and food producers, but the impact on the social behaviors of the children was under-researched. New studies have found direct effects on social behaviors such as better attendance, improved general behavior and improved relationship building. Additional findings have discovered how the 'experience' of breakfast programs, such as the physical environment and the staff who run them, can have an impact on reducing social stigma and overall self-esteem. These benefits reach beyond the school gates to family and the wider community. In recent work, the importance of highly effective school leadership and staff on the efficacy of breakfast program outcomes is emerging. (See bibliography for full list of papers.)

School attendance, friendships and behavior has been shown to improve.

There is strong evidence across the board that eating a regular breakfast has a positive impact on school attendance. A 2010 study from India (Afridia, Barooahb & Somanathanc, 2010) showed that eating breakfast had a significant effect on school attendance among younger boys. Similarly, a study by Gemino and Tan (2016) showed improvements across several measures such as late attendance, more participation in school activities and general behavior improvements. Defeyter, Graham and Russo measured friendship quality and peer victimization. The results highlighted how those who attended school breakfast programs over a period of time developed an improved quality of relationships with their friends and were at a reduced risk of victimization.

Dotter's (2012) research showed that the introduction of breakfast in the classroom in San Diego had an impact on teacher-reported classroom behavior such as exhibiting "respect for people and property." Deppe's (2017) qualitative study again highlighted how involvement in school breakfast programs helped develop positive behaviors in school. Her research highlighted the following new behaviors among children who attended or took leadership roles in breakfast programs: leadership, commitment and awareness of the needs of others. They also were able to maintain strong academics and remained active in other areas of the school.

Additionally, eating a healthy breakfast has identified decreased disciplinary referrals and increased student responsibility (Haesly et al 2014; Rainville and Carr 2008). A Canadian report (CBC Report 2013) identified a correlation between the introduction of a breakfast program and a significant reduction in violent incidents at the school being observed. This report also highlighted the social aspect of daily breakfast which in turn led to a more "amicable environment within the school." (Gemino & Tan, 2016).

Especially where breakfast is eaten in the classroom, there is a great opportunity to role model positive behaviors. The breakfast program represents a positive social setting for many children. How meals are eaten together can be modeled by staff and teachers and presents a significant learning opportunity from a behavior perspective. (Behaviour in schools, U.K. Government paper 2010). A Canadian study by H. Sampasa-Kanyinga and Hamilton (2017) found that eating breakfast regularly increased social connectedness; students developed better friendships and relationships with adults. Nicole Deppe's 2017 study demonstrated that school food programs positively impact several areas of social behavior including mood, development of social skills, building relationships and developing social interaction.

The role of the school is vitally important and has a direct relationship with the success of breakfast programs. If badly handled, they can lead to stigma. However, when properly planned, school breakfast programs can have the wide-reaching consequences discussed in all the previous sections. Deppe's 2017 study looked at the stigma associated with participation in school breakfast programs and found it was reduced when all children attended the programs. Otherwise, attendance was low due to fear of stigma. The perception of school breakfast programs has a direct impact on participation in breakfast program places, and some studies have looked at how to reduce this associated stigma (Urbela, Schwartz et al, 2013). Two routes that have been tried and found to be successful are universal schemes and eating breakfast in the classroom.

The importance of the relationship between schools and parents in terms of support and education was highly evidenced. In some regions, school food programs enabled education for children and parents around healthy eating and nutrition (Oostindjer, Aschemann-Witzel et al, 2017; Kitaoka, 2018). In all cases, developing and using parental support for breakfast programs improved all outcomes and had positive effects at home. (Haerens, Bourdeaudhuij et al, 2009, Oostindjer, Aschemann-Witzel et al, 2017). Qualitative research from the U.K. showed how the support to working parents also is a dependable form of reliable and affordable childcare – especially for those without an extended support structure. This was seen to reduce stress for the entire family in the mornings with less arguing between siblings and a quicker exit from the home.



EATING A HEALTHY, NUTRITIONAL BREAKFAST REDUCES MALNUTRITION AND OBESITY AND IMPROVES MENTAL HEALTH

Breakfast is a really important meal in the health and nutrition space. Evidence shows that if children miss breakfast it is very hard for them to catch up later in the day (Schanzenbach and Zaki, 2014). The primary focus of breakfast programs for many years was nutrition, solving for malnutrition, and latterly obesity (Faber, Laurie et al, 2013, Frank, Brettschneider et al, 2019, Holmes, Kaffa et al, 2012, Fernandes, Galloway et al, 2016). Research studies from Africa to the U.K. have focused on the impact of eating breakfast on several health measures. Many of these studies tracked anthropometric measures such as BMI, weight for age, height for age, etc. In almost all instances, the results were clear. Over the years, the research has established that the introduction of breakfast programs can lead to significant improvements in relation to increasing BMI by age, improving height for age, weight for age and reducing stunting (Graham, Hochfeld et al 2015, Hochfeld et al, 2016, Jomaa, McDonnell, Probart, 2011). These findings firmly connect the positive impact of a good breakfast on poor physical development in children.

Even children who eat a second breakfast at school are not likely to be more

obese. The picture for obesity is similarly positive. A 2017 study from Germany (Kesztyus et al, 2017) tracked abdominal obesity in children aged 5-10. It found that this increased when breakfast was skipped. Measuring anthropometric indicators as well as lifestyle factors such as socio-economic status (SES) and other behaviors, they found that breakfast skipping, consumption of carbonated drinks along with low SES and higher levels of screen time were linked to obesity. An evaluation of the New York City breakfast in the classroom program even found no evidence for increases in obesity if the children had more than one breakfast (Corcoran, Elbel et al, 2016).

Quality of breakfast is key. Several studies investigated the value of different types of breakfast or breakfast alternatives (such as energy drinks and snacks). Fortified cereals were shown to lead to better outcomes across several measures. In Mexico, Afeiche, Smith Taillie et al (2017) looked at type of diet consumed by children and how they compared to government nutrition guidelines. While 83% of the subjects ate breakfast regularly, there were sizeable differences in nutritional value depending on geographical location and SES. Those who ate a more western diet, especially for breakfast, had better balanced diets. A German study (Alexy et al, 2010), tracked children ages 2-18 using an observational/diary method. They found those children who ate more bread-based food had a poorer diet overall.

The issues being addressed around malnutrition and obesity are still not always the same. There is a significant difference between geographies where there is not always enough food and those where children, and in particular adolescents, are choosing to skip breakfast.

Breakfast skipping is affecting teenage girls in particular. Recently there has been an upsurge in research studies looking at the impact of breakfast skipping. The health impacts of breakfast skipping on obesity and malnutrition can be significant, as well as on cognitive development. The research indicated that adolescent girls are more likely to skip breakfast than their male counterparts and that this will increase with age (Vereeckan et al, 2009). A study (Corder et al, 2011) among English adolescents found that girls who skipped breakfast had lower physical energy in the mornings compared to boys and outlined the implication on performance and cognition, particularly concentration. Similarly, Smith, Breslin et al (2017) found that breakfast skipping was more prevalent among teenage girls in an Australian school and that this was linked to lower SES and inadequate sleep.

Focus is increasingly turning to the mental health benefits of breakfast and the impact of food insecurity. A newer area of focus for breakfast programs is that of mental health. There is a growing body of work, especially from the U.K., suggesting that eating breakfast can be an indicator of lower stress, anxiety and depression levels among kids. Both self-reported studies and those involving parents also reported better wellbeing measures – such as positive mood and alertness, as well as less overall fatigue. Breakfast omission, through breakfast skipping, is consistently associated with negative mental outcomes and wellness. (See bibliography: health outcomes.).

While food programs have not shown links to obesity or mental health, food insecurity, even for a short time, has been shown to have highly negative effects on children and adolescents, in countries where it has been studied. For example, a review of food insecurity in Canada found the following effects: mental health issues around suicide and depression; changes in mood, behavior and substance abuse; a higher likelihood of chronic diseases in later life, such as heart disease, and cancers for those that endure toxic stress or hunger in childhood. (Ke and Lee Ford- Jones, 2015) Also, those who experienced food insecurity had a higher likelihood to be obese in childhood.



BREAKFAST HAS AN IMPACT ON COGNITIVE FUNCTION

Briefel et al. (1999) summarized the research evidence on cognitive impacts and concluded “skipping breakfast interferes with cognition and learning, and that this effect is more pronounced in poorly nourished children.” In *Nutrition and Cognitive Achievement: An Evaluation of the School Breakfast Program*, David E. Frisvold outlines the reasons why nutrition would have such an impact on memory and cognition. (David E. Frisvold. D.E., 2015).

Results from the U.K. and U.S. in particular push the research further – demonstrating that cognitive responses improved after breakfast and this was a good time to do cognitively demanding work. Four areas of particular interest have developed: improved attention, better memory, on-task concentration and better results.

Eating breakfast leads to improved attention. The first of the areas of cognitive improvement researched is that of attention. Studies from India to the U.K. show the impact on attention. For example, an internet-based study in the U.K. (Wesnes et al,

2012) showed how those who had breakfast had 7% higher scores for attention in a mid-morning task. They were less distractible and more focused and able to distinguish between two different pictures than those who had not eaten breakfast. Response speeds in those who did not have breakfast were 10% slower than those who did. Attention is only one aspect of cognitive function that improved.

And better memory and improved on task concentration. A systematic review (Adolphus et al, 2016) looking at previous studies to measure the effect of breakfast interventions on cognitive outcomes and other measures across the U.K. found that breakfast had an impact on attention, memory and executive function. As with improved attention, timing is a factor (i.e., the further away from breakfast it was the less impact breakfast had). Other evidence of better memory function comes from as diverse subjects as understanding the impact of Glycemic index / glycemic load in school children – self-reported positive memory and concentration impacts – through to smaller studies in countries such as India. For example, a small-scale study on the effect of a school meals program in Delhi studied classroom effort of students (Afridia et al 2013). Through stimuli activities such as games they were able to measure and saw an increase in effort and concentration from eating breakfast.

Unsurprisingly this led to improved results. Many of the studies into results have concentrated on creating tests for math and reading. Globally the quality and, to a certain extent, the quantity of breakfast has been shown to have an impact. In the U.S., a number of studies identified a short-run effect. For example, a study in Virginia found evidence that schools increased the caloric content of their meals on test days and saw larger increases in passing rates as a result (Figlio & Winicki, 2005). Imberman and Kugler (2014) found the introduction of breakfast in the classroom even just before a test led to an improvement in reading and math achievement. (Corcoran, Elbel et al, 2016).

Longer-term work in the U.K., examined the link between breakfast consumption in 9-11-year-old children and educational outcomes obtained 6-18 months later. Conducted in Wales, it measured national SAT test scores. Results showed significant associations between all dietary behaviors and better performance on the SATs. It also found the impact increased closer to exams.

| NEXT STEPS AND IMPLICATIONS FOR FUTURE RESEARCH

An emerging body of evidence suggests that breakfast programs are likely to have a significant effect on children's behavior at school, however more study is needed. A recent review by Adolphus et al, (2020) highlights the impact on parents and school staff as well as pupils in a small number of schools in the northeast region of the U.K. Future research could build on this small qualitative study by extending the scope to include multiple regions and countries around the world. This would give insight into whether the same advantages and disadvantages are identified universally or differ by areas – and if possible, by different SES.

| IN SUMMARY

The case for school breakfast programs in terms of health outcomes is strongly evidenced; children who eat breakfast at school become healthier across all key measures. Conversely eating breakfast (or even two breakfasts) has no link with obesity. The 'new' issues relating to health concern breakfast skipping among adolescent girls and improving mental health especially among food insecure children. Early signs show that there is some benefit to both.

In addition, breakfast programs have been shown to improve cognition in school in the following ways: attention, memory, on-task concentration and academic results. The link between breakfast and better academic results needs further exploration to be fully confirmed.

Finally, the social impact of eating breakfast at school is an interesting and growing area of research. There is strong, emerging evidence that breakfast programs can add more to a school than simply an early meal and improved attendance. Breakfast programs can grow to become community- building experiences that help to create a sense of belonging in students, enabling the development of positive relationships between students, teachers, and staff. Early research also has shown that such programs can lead to an improvement in classroom behavior and have a positive impact on the wider community including key stakeholders such as parents and staff. This is an interesting avenue of future research.