Milk-fortified meals improve school attendance

A daily school meal with milk increases attendance among children in rural Ghana.

Project Peanut Butter (PPB) works to improve the health and education of children in Ghana through school feeding programs. Northern Ghana has the highest rate of child malnutrition in the country. School feeding programs can help by giving children a nutritious meal during the school day, augmenting the food the child receives at home. Ghana's national school feeding program reaches over four million children, but in remote rural areas like northern Ghana, funding is often delayed and resources stretched thin, so meals are sometimes missed or may not include the full range of nutrients children need. This study, funded by the Danish Dairy Research Foundation, tested whether a centrally produced school food with milk powder could increase how often children attended school.

Why milk?

Milk contains high-quality protein, essential amino acids, and key nutrients that growing children need. PPB previously showed that adding milk to school food improved cognition in school-aged children in Ghana, and that higher milk protein intake improves memory, executive function, and growth. Yet in rural northern Ghana fresh milk is rarely available, and milk and dairy are uncommon in children's diets.

The study

This trial took place in 20 schools in Mion District in northern Ghana between May 2024 and May 2026. Half of the schools were randomly assigned to give children a peanut-based ready-to-use school food fortified with fat-free milk powder (PM-RUF), and half prepared traditional local meals from rice and other ingredients. Both meals contained around 400 calories per day.







BY ELIZA KLEBAN[1], SENIOR CLINICAL RESEARCH COORDINATOR; KEVIN STEPHENSON, MD[1], ASSISTANT PROFESSOR OF MEDICINE; MARK MANARY, MD[1,2], HELENE B. ROBERSON PROFESSOR OF PEDIATRICS

[1] Washington University School of Medicine, St. Louis, MO, USA
[2] Project Peanut Butter, Ghana

PROJEKT OVERVIEW

Title: Milk-Fortified Meals Improve School Attendance

Project manager: Mark Manary

Participants: Issah Saani, University of Ghana

Project period: May 2024 – May 2026

Objective: To determine whether a centrally produced ready-to-use school meal with milk powder increases school attendance among primary and junior high school students in rural northern Ghana, compared with a traditional locally prepared school meal.

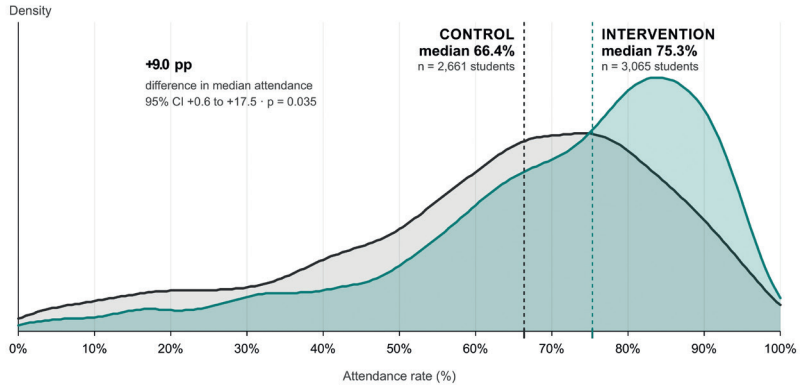
PROJECTS RELATED TO THE DANISH DAIRY RESEARCH FOUNDATION

The PM-RUF was a peanut-based paste with milk powder, cowpea, palm oil, sugar, and 14 added micronutrients, served as a single-serving sachet. The local meals were rice-based dishes such as jollof rice or rice with groundnut soup. The study supplied rice and funds for additional ingredients directly to the control schools so they could prepare meals consistently throughout the trial, modeling the intended delivery of Ghana's national school feeding program.

More than 5,700 children aged 5-17 took part in this study. Daily attendance was tracked across all 20 schools using biometric fingerprint scanners. Unlike many school studies that rely on teacher-kept registers, this allowed us to measure attendance objectively for each individual child, every school day, for two years.

Intervention shifts the student attendance distribution rightward

ALL SCHOOLS · PER-STUDENT ATTENDANCE RATE



What we found

Children at schools receiving the milk-fortified food attended school significantly more often than children at schools receiving the traditional meal. Median daily attendance was 75% in the schools receiving PM-RUF compared to 66% in the control schools, a 9-percentage-point difference. This effect was seen both in younger primary school children and older junior high school students. Children in the intervention schools were also more likely to maintain high attendance, with 39% attending more than 80% of school days, compared with only 24% in the control schools.

How can the industry benefit from this research?

This study shows that fat-free milk powder, when included in a shelf-stable, centrally produced school food, can be delivered reliably to remote rural areas where fresh milk is often not available. It also shows that adding milk powder to a school meal helps children attend school more often. This highlights milk powder as a high-value ingredient for school feeding programs in regions where cold chains do not reach, and it adds to the growing evidence that dairy plays an important role not only in malnutrition treatment but also in supporting children's broader development and education. ●



ABSTRACT

In this cluster-randomized trial, a peanut-based school food fortified with fat-free milk powder was compared to a traditional locally prepared school meal in 20 schools in rural northern Ghana. The milk-fortified food contained more protein, calcium, and key micronutrients than the local meal. We hypothesized that the milk-fortified food would increase school attendance. Across 5,726 students over two years, children at PM-RUF schools attended school significantly more often than children at control schools (75% vs. 66%) and were more likely to maintain high attendance. These results show that milk powder in school feeding programs can improve participation in food-insecure settings.