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2017 Endline Survey of Indonesia's School Meals Programme (Pro-GAS)

March 2018



World Food
Programme

Endline Survey of the National School Meals Programme (Pro-GAS)



1. Background

Indonesia faces issues of undernutrition, overweight and obesity. Nutrition indicators have shown little improvement since 2007, with one in three children aged under five are stunted; in 15 of 34 provinces this exceeds 40 percent. High levels of stunting in early life may impact children's academic performance and ultimately the quality of human resources. Moreover, a significant number of children from 6 to 14 years old consume insufficient calories and protein for healthy growth and development. Undernourishment in school age children may impact their ability to concentrate and lead to absenteeism due to vulnerability to illness.

With support from Cargill and WFP, the Ministry of Education and Culture helps poor students across the country enjoy healthy meals and learn about nutrition and hygiene through Indonesia's home-grown school meals programme (known as Pro-GAS). We are leveraging school meals not only as a source of nutrition, but also as an economic opportunity for local farmers. WFP in partnership with Cargill foster sustainable school meals supply chains and at the same time promote nutritious, balanced diets with a particular focus on primary aged students, women and youth.

This partnership is aligned with the Sustainable Development Goals (SDGs) 2 (zero hunger) and 4 (quality education), while also impacting SDG 17 (partnerships to achieve the SDG goals).

Through funds from Cargill in 2017, WFP was able to provide capacity strengthening support for the Ministry of Education and Culture. Targets for the national school meals in 2017 have increased across five provinces to 100,000 students and 563 primary schools across 11 stunting priority districts, as compared to 38,500 students and 150 primary schools across four districts in 2016 when Pro-GAS started.

Under the 2017 WFP-Cargill partnership, Pro-GAS model was replicated in three districts -- Serang, Pasuruan and Belu -- in addition to the 11 priority districts selected by Indonesia's Ministry of Education and Culture. The WFP-Cargill partnership was extended to one primary school in Serang district, Banten province, two schools in Pasuruan district, East Java province and one primary school in Belu district, Eastern Nusa Tenggara province.

The three main components of Pro-GAS includes nutrition education, provision of nutritious meals and community participation. The nutritious meals, nutrition, health

and hygiene education are intended to address the low nutritional status of primary-age children, improve health and hygiene behaviours, attendance rates, as well as students' active participation in class.

In order to measure the impact of Pro-GAS in schools supported by Cargill, WFP conducted an endline survey using a quasi-experimental (pre and post intervention and control groups) approach. The control schools were selected from neighboring areas of the target schools of Cargill-led school meals programme. For the purpose of this endline survey, Serang and Pasuruan districts were selected as locations of the population sample.

More specifically, the endline survey compared the findings between baseline and endline data of the following indicators:

- a) Students' knowledge of nutrition, health and hygiene
- b) Personal hygiene of school children;
- c) Students' food consumption habits;
- d) Students' access to safe drinking water;
- e) Students' academic performance;
- f) Students reported ill in the past month;
- g) Attendance Rates' (number of absences in the past six months);
- h) Students concentration in class;
- i) Physical fitness of school children; and
- j) Nutritional status of school children;

A separate study was conducted by SEAMEO, a research institution on the impact of Pro-GAS implemented directly by the Ministry of Education and Culture in 11 districts.

2. Methodology

2.1. Sample Population and Locations

A baseline was established with 185 students from six schools. The endline survey was conducted from 7 to 12 February 2017 amongst 175 students (97 boys/79 girls) selected from the same six primary schools in Serang and Pasuruan districts surveyed in the baseline. The endline survey collected data from 175 of 185 students across six primary schools in the two selected districts. Hence, children's participation during the endline survey stood at 89.2 percent of the total number of students. The assessment took place at school therefore only students who were present at school on the day of assessment were included.

Table 1. List of schools and number of respondents

District	School name	Treatment	Number of subjects		
			Boys	Girls	Total
Serang	SDN Citawa	Intervention	5	10	15
Serang	SDN Gorda I	Control	12	20	32
Pasuruan	SDN Ngerong	Intervention	27	18	45
Pasuruan	SDN Wedoro 2	Control	13	3	16
Pasuruan	SDN Gunung Sari 2	Intervention	10	3	13
Pasuruan	SDN Pogar 2	Control	29	25	54
Total			97	79	175

2.2. Data Collection Methods

The same procedure of data collection as the baseline survey was used to ensure that the results comparison remains accurate between baseline and endline surveys. However, additional information was added in the endline questionnaires where relevant.

The procedures and tools that were used are described as follows:

1. In-depth interviews using structured questionnaires for school children in order to collect general information such as date of birth, reported illness, personal hygiene, concentration and hunger, activity during class session, food consumption habits, as well as nutrition, health and hygiene knowledge;
2. Observation of personal hygiene, in particular nail condition;

3. Anthropometry measurement consisting of body weight and body height measurement. The body weight was measured using digital weighing scale SECA Clara 803 while height was measured using stadiometer SECA 213;
4. Hemoglobin was measured using HemoCueHb 301+ Analyzer from finger-prick blood; and
5. Self-administered questionnaires for headmasters assessed a series of relevant habits and behaviours of children.

Anthropometry measurement was conducted by the lead researcher. Data was collected by trained enumerators from the local areas under the supervision of the lead researcher. Meanwhile, the hemoglobin measurement was conducted by local health center personnel.

The lead researcher provided a training for enumerators prior to the start of data collection. The enumerators were also responsible to check the completeness of information in the questionnaires, hemoglobin measurement and anthropometry measurement. All completed questionnaires were then compiled for data entry and analysis.

Data was entered and analyzed using SPSS 20 to obtain students' nutritional indices, a macro for SPSS of the WHO Anthro v.1.0.2 was used for this purpose. Subsequently, data was checked and cleaned to prepare for data analysis.

Bivariate analysis was used to assess the different findings of the baseline and endline surveys and between intervention and control groups using chi-square test for categorical data and independent T-test for continuous data.

A p-value of <0.05 was considered as significant. In the results section, a sign of * indicates the significant level of $p < 0.05$, ** indicates $p < 0.01$, and *** indicates $p < 0.001$.

Anemia status was obtained from data on hemoglobin measurement.

Table 2. Criteria of anemia status based on hemoglobin concentration (WHO, 2011)

Anemia Status	Hemoglobin Concentration
Normal/No anemia	≥ 11.5 g/dL
Anemia	< 11.5 g/dL
- Mild anemia	11.0 - < 11.5 g/dL
- Moderate anemia	8 - < 11 g/dL
- Severe anemia	< 8 g/dL

The nutritional status of children was categorized according to the WHO cut-off values for public health significance:

1. Stunting prevalence

- Low: < 20 percent
- Medium: 20-29 percent
- High: 30-39 percent
- Very high: 40 percent

2. Wasting prevalence

- Acceptable: 5 percent
- Poor: 5-9 percent
- Serious: 10-14 percent
- Critical: ≥ 15 percent

The food consumption score was calculated based on consumption of several food groups consumed in the preceding week. These food groups include: (i) Cereals/staple; (ii) Vitamin A rich vegetables and tubers; (iii) Green leafy vegetables; (iv) Other vegetables and fruits; (v) Vitamin A rich fruits; (vi) Meat; (vii) Eggs; (viii) Fish.

Nutrition and health knowledge and practice was assessed through questions on food for breakfast, balanced diets, food groups as source of energy and protein, safe drinking water, personal hygiene, food safety/hygiene, and food purchased outside (from street and/or school vendors).

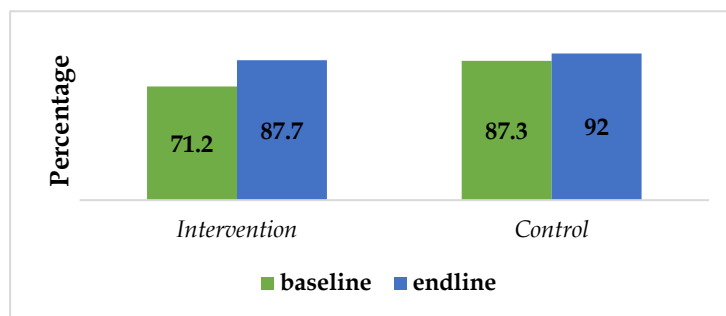
Children considered with good knowledge if they could answer correctly at least 75 percent of the questions on nutrition and health.

3. Results

3.1. Students' Knowledge of Nutrition Improved

In the intervention group, there was a significant increase in the proportion of children who demonstrated good nutrition, health and hygiene knowledge and practice during the endline survey as compared to baseline survey: **87.7 percent as compared to 71.2 percent.**

Figure 1. Nutritional Knowledge, Attitude and Practice among Children



In particular, students demonstrated good understanding of types of nutritious food for breakfast, the importance of having nutritiously balanced meals every day, types of food which contains protein, energy and vitamins.

Table 4. Detailed Nutritional Knowledge among Children

Description	Percentage					
	Intervention			Control		
	BL	EL	Sig.	BL	EL	Sig.
Breakfast should contain nutritious, healthy and safe foods	87.7	96.9	*	94.1	99.0	NS
Nutritionally balanced diets consumed 3 times a day helps you to maintain your health	86.3	92.3	*	93.1	92.0	NS
Without 3 meals a day, you will not have the energy your body required	80.8	84.6	NS	78.0	89.0	*
Fish, egg and meat are sources of protein	75.3	93.8	**	89.2	90.0	NS

Description	Percentage					
	Intervention			BL		
	BL		BL		BL	
Rice, corn, cassava and tubers are sources of energy	78.1	84.6	*	90.2	93.0	NS
Vegetables contains protective ingredients which keeps the body healthy and prevent illnesses	84.9	92.3	*	94.1	94.0	NS
Fruits contain protective ingredients which keeps the body healthy and prevent illnesses	89.0	95.4	*	94.0	95.0	NS
Food purchased outside is (not) good for health	67.1	70.8	NS	66.7	68.0	NS

3.2. Students' Personal Hygiene Improved

In the intervention group, the proportion of children who brushed their teeth before bed time every night was significantly higher during endline survey: **96.7 percent as compared to 74 percent**. Meanwhile, the number of students who washed their hands before eating increased to **95.4 percent from 93.2 percent** and students who trimmed their nails regularly also increased to **66.2 percent from 54.8 percent**.

Figure 2. Personal Hygiene: Intervention Group

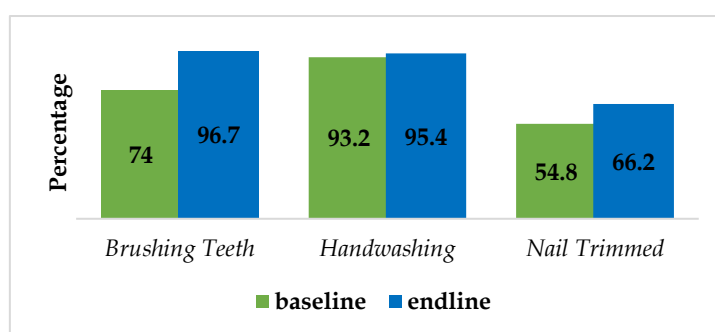


Table 5. Personal Hygiene and Grooming Habits amongst Students

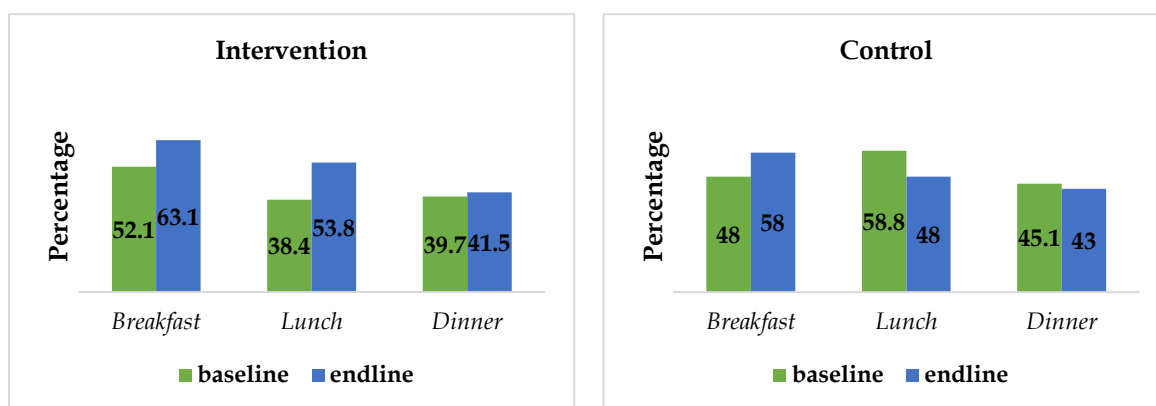
Description	Percentage					
	Intervention			Control		
	BL	EL	Sig.	BL	EL	Sig.
Brushing teeth before sleeping						
- Every day/sometimes	74.0	96.7	***	88.1	92.0	NS
- Never	26.0	3.3		11.9	8.0	
Nail condition	54.8	66.2	**	76.5	53.8	**
Students who washed their hands with soap and running water prior to eating and after defecating			NS			NS
- Always/often	93.2	95.4		99.0	98.0	
- Never	6.8	4.6		1.0	2.0	

3.3. More Children Consumed Regular Balanced Meals

Pro-Gas was not intended to replace breakfast or lunch at home. The design of the programme aimed to complement breakfast provided at home.

In the intervention group, there was a significant improvement in the number of students who consumed breakfast at home: **63.1 percent as compared to 52.1 percent.**

Figure 3. Food Consumption Habits amongst Children



In the intervention group, the proportion of children who consumed a balanced meal three times every day was significantly higher during the endline survey: **47.7 percent as compared to 24.7 percent**. Meanwhile, the proportion of children who purchased food outside from street and/or school vendors every day was significantly lower during the endline survey in the intervention group: **78.5 percent as compared to 91.8 percent**.

In addition, more students in both groups consumed fruits and vegetables: **13.1 percent as compared to 6.8 percent**.

Table 6. Types of Food Consumed by Students and Frequency

Description	Percentage					
	Intervention			Control		
	BL	EL	Sig.	BL	EL	Sig.
Consuming balanced diets						
- Every day	24.7	47.7	**	44.1	34.0	*
- 3-6x/wk	32.9	16.9		29.4	25.0	
Habits of eating fruits and vegetables every day	6.8	13.1	*	8.0	14.0	*
Habits of buying food outside home	91.8	78.5	*	84.8	73.1	*

In the intervention group, the endline survey found the consumption of green leafy vegetables significantly increased to **46.2 percent from 33.3 percent**.

The number of children who consumed mango and papaya as fruits increased significantly in the intervention group during the endline survey to **23.1 percent from 13.7 percent**. These fruits were the most consumed ones amongst children in the intervention group. Usually, children in the intervention group consumed mango during breakfast and papaya as snacks.

Consumption of meat or poultry rich in protein also increased significantly to **27.7 percent from 19.2 percent**.

Table 7. Food Group Consumption in the Preceding Week

Description	Percentage					
	Intervention			Control		
	BL	EL	Sig.	BL	BL	Sig.
Porridge, bread, rice, noodle, vermicelli, corn, bosc corn, biscuit	80.8	90.8	**	85.3	87.0	*
Potato, sweet potato, cassava, yam, taro	12.3	1.5	**	16.7	5.0	**
Green leafy vegetables	33.3	46.2	**	54.9	38.0	**
Mango, papaya	13.7	23.1	**	25.5	12.0	**
Meat, beef, pork, mutton, chicken or duck	19.2	27.7	*	27.5	14.0	**
Eggs	41.1	40.0	NS	47.1	35.0	**
Fresh or dried fish, oyster, seafoods	24.7	12.3	**	25.5	38.0	**

3.4. More Children Drank Cleaner Water

During the endline survey, observation was made on children’s housing situations where **75.8 percent** of the children had access to a clean water source while another **94.5 percent** had access to latrine at home.

In addition, **63 percent** of the households used a commercial water refill service to access drinking water while another **30.9 percent** of the households were using boiled tap/well water for drinking.

The number of students in the intervention group who drank more or less six glasses of water every day significantly increased to **34.5 percent from 22.5 percent**. Significant improvement was also observed in the number of students who brought boiled water to school at **55.4 percent from 31.5 percent**.

Table 8. Access to Safe Drinking Water

Description	Percentage					
	Intervention			Control		
	BL	EL	Sig.	BL	BL	Sig.
Drinking water						
- ≥6 glasses/day	22.5	34.5	*	29.7	53.2	**
- <6 glasses/day	77.5	65.5		70.3	46.8	
Drinking water at school						
- Brought boiled water from home	31.5	55.4	***	33.3	63.8	***
- Other sources	53.4	9.2		45.1	14.9	
Drinking water at home						
- Boiled water	61.6	78.5	***	52.0	73.7	***
- Other sources	38.4	9.2		48.0	19.2	

3.5. Students' Food Safety Habits Improved Significantly

The food safety habits of children in the intervention group improved significantly with more children practiced washing fruits prior to eating: **95.1 percent as compared to 79.5 percent.**

Table 9. Food Hygiene Habits amongst Children

Description	Percentage					
	Intervention			Control		
	BL	EL	Sig.	BL	EL	Sig.
Students who washed fruits prior to eating						
- Always/sometimes	79.5	95.1	**	92.2	97.0	NS
- Never	20.5	4.9		7.8	3.0	

3.6. Students' Academic Performance Slightly Increased

Overall, the scores for Bahasa Indonesia, Mathematics and Science studies slightly increased. In the intervention group, the score of Civics study significantly increased to **76.2** as compared to **70.8**.

Table 10. Grade on Selected Courses

Description	Intervention			Control		
	BL	EL	Sig.	BL	EL	Sig.
Civics	70.8	76.2	*	81.6	83.5	NS
Bahasa Indonesia	71.9	74.6	NS	81.1	82.8	NS
Mathematics	69.1	72.5	NS	78.3	83.2	***
Science	71.3	74.1	NS	81.2	82.6	NS

3.7. Fewer Students Reported Feeling Ill

The number of students in the intervention group who reported being ill in the last month decreased significantly during the endline survey to **38.5 percent as compared to 75.3 percent**. In particular, the prevalence of common cold and fever decreased significantly in the intervention group to **7.7 percent from 35.6 percent and 13.8 percent from 32.9 percent** respectively.

Table 11. Prevalence of Illnesses amongst Students

Description	Percentage					
	Intervention			Control		
	BL	EL	Sig.	BL	EL	Sig.
Diarrhea	11.0	9.2	NS	15.7	3.0	***
Cough	27.4	16.9	NS	37.3	25.0	*
Common cold	35.6	7.7	***	29.4	28.0	NS
Fever	32.9	13.8	**	33.3	11.0	***
Headache	16.4	7.7	NS	11.8	4.0	*
Ill	75.3	38.5	***	71.6	51.0	**

3.8. Attendance Rates Improved Significantly

The number of recorded days of absence from school due to illness in the past six months reduced significantly to **56 days from 61 days**.

Table 12. Prevalence of Illnesses amongst Students: Intervention Group

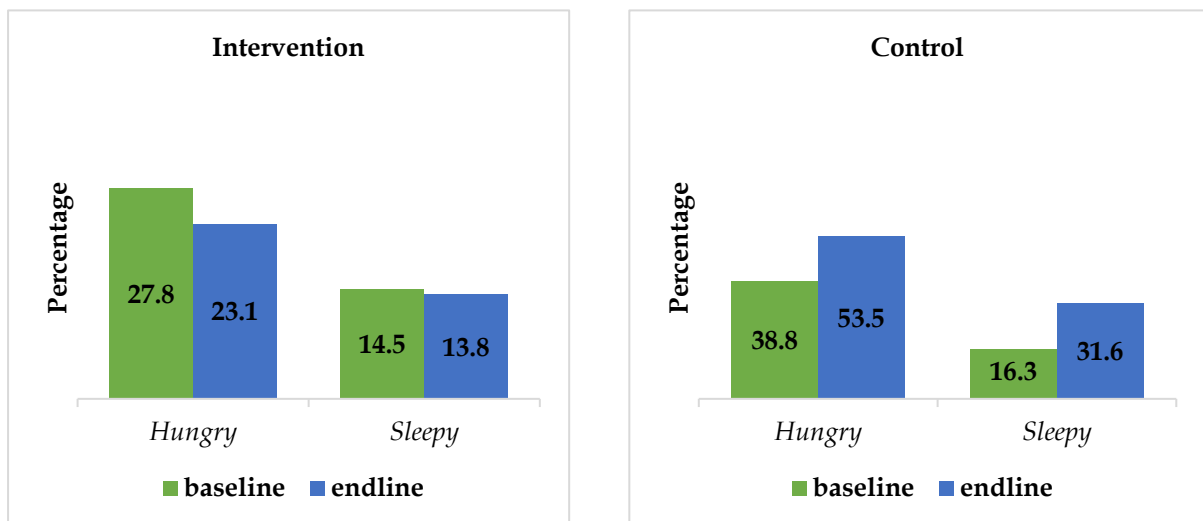
School Name	Days of Absence due to Illness	
	BL	EL
SDN Citawa	25	27
SDN Gunung Sari	5	4
SDN Ngerong	31	25
All schools	61	56

3.9. Students were Able to Concentrate Better in Class

In the intervention group, the number of students who reported feeling hungry and sleepy in class during the endline survey reduced to **23.1 percent from 27.8 percent** and **13.8 percent from 14.5 percent** respectively.

Meanwhile, the proportion of children who experienced hunger and sleepiness in class in the intervention group was significantly lower than that in the control group.

Figure 4. Experience of Hunger and Sleepiness among Children



3.10. Too Early to See Changes in Nutritional Status

In the intervention group, there was no statistically significant change in the stunting prevalence which stood at **15.4 percent** (low). Meanwhile, the acute malnutrition (weight for height) also remained the same at **9.2 percent** (acceptable). Similarly, the hemoglobin concentration remains the same at **<8 g/dL** (moderate).

The prevalence of overweight increased to **12.3 percent from 8.3 percent** while obesity remains the same at **4.6 percent**. Given the increasing number of overweight children, it is important to consider making an adjustment to the composition and portion of meals provided across four schools in Cargill intervention areas.

Considering these findings, it is concluded that a follow up survey is needed after a longer intervention period (beyond the current 10 months implementation period) to measure improvement in students' nutritional status in the long run.

Table 13. Nutritional Status of Students in Both Groups

Groups	Nutritional Status			
	Stunting	Wasting	Overweight	Obesity
Intervention	15.4	9.2	12.3	20
Group	11	8	10	4.6

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