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School Meals in Dublin's Inner City

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Malnutrition and hunger can impair the learning process and influence behavioural patterns. It has also been recommended that lunch should provide one third of the daily requirement of nutrients as outlined in the recommended daily amounts (RDA). There is evidence which favours an even distribution of food intake throughout the day rather than the concentration of intake around one or two meals. This and other reasoning has led to the establishment of school meal programmes in many countries, including Ireland, which in turn gives rise to the need for periodic review and assessment of such programmes.

Malnutrition and hunger can impair the learning process.

A large study

The current assessment, which was commissioned by the Combat Poverty Agency, was carried out in five Dublin inner-city primary schools and involved 449 schoolchildren. It was a large study and a major report (84 pages) has been submitted to the commissioning agency.

In the study, Schools 1 and 2 provided a mid-day hot dinner while Schools 3-5 provided a lunch of sandwiches/buns together with soup and milk. The meals were assessed each week for 8-10 weeks for four of the schools; meals were not assessed in School 5. Menu variation, portion sizes, plate waste and 'kitchen regimes' were evaluated, and children's weight and height (for age) were compared with Irish clinical growth standards. The children in the five schools were interviewed about their meals consumed at home and also about their food likes and dislikes.

Acceptability of dinners—Schools 1 and 2

Virtually every child attending School 1 on the test dates (9-13 year olds; co-ed), consumed all or part of a dinner. The percentage of dinner (main course and dessert, sometimes soup also) uneaten ranged from 0 to 15% (Table 1). If 10% 'left overs' is taken as the upper limit, then this figure was exceeded on four of the test dates. The dinners for these four days were stew, fish/chips, burger/turnip/mashed potato and shepherd's pie. Over 10% of the children disliked sprouts, turnip, stew, cauliflower and peas, and this to an extent reflects the 'left overs' data. On occasions, portion control left something to be desired (i.e. % coefficient of variation [CV] >15) with 'too wide' a range in size of helpings. This occurred for beans, dream topping, turnip, meat and carrot in stew, fish, chips, and fruit salad on some

TABLE 1: Summary data for dinners in schools 1 and 2

	Test day	No. of children	Dinner uneaten (%)
School 1	1	47	5
	2	50	8
	3	51	11
	4	49	4
	5	49	15
	6	49	2
	7	48	9
	8	58	11
	9	59	12
	10	50	9
School 2	1	56	2
	2	60	1
	3	60	1
	4	58	2
	5	55	2
	6	58	2
	7	58	6
	8	58	0
	9	56	3

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of the test dates. The menu variation for the dinners was reasonable, bearing in mind the limitations of cost and the fact that many children would not eat new (to them) or more exotic dishes. Moreover, the frequent use of mashed potatoes is praiseworthy as they are an excellent food. However, care must be taken to have them freshly prepared as otherwise significant amounts of vitamin C will be lost.

Virtually all the School 1 dinners were somewhat deficient in energy, calcium and thiamin but had more than adequate protein and vitamin C. In addition, not all of the dinner is consumed by every child. However, it is *unlikely* that this reflects a very serious situation as these are only approximate data, particularly bearing in mind that most children seem to have a good overall food intake based on the interview data. Nevertheless, the situation should be rectified by serving larger helpings of carbohydrate in the form of mashed potato or bread rolls or rice pudding in order to increase energy intake. Additional fat is not recommended as the percentage of calories in the diet from fat was generally above 35%.

Virtually every child in School 2 (5-9 year olds; co-ed) consumed all or part of a dinner (only a main course served) together with a 189 ml carton of milk. The percentage of each dinner uneaten each day was low at ≤ 6% (Table 1), indicating that acceptability was high. This did not include milk, and a consumption figure of 92% was estimated based on data from School 3. Potatoes (25% of children), sausages (%) and mince (12%) were the most major dislikes in relation to the school dinners. The fat content of the dinners was on the high side with the percentage of calories from fat ranging from 44 to 53%. Portion control for beans (% CV >15) was often poor with a wide variation in size of helpings on four of the test dates. Large variations were also found for sausages (day 3) and mashed potato (day 7). There was little variation in menu, with beans being the only vegetable served, while meats included only burgers, sausages and mince. Fish fingers were also served, and chips and mashed potatoes were served on alternate days. Obviously it would be beneficial if this menu could be broadened especially in the area of vegetables and by including a dessert.

Largely the same situation prevailed for the School 2 dinners as for School 1, and most of the comments and recommendations made above apply here also. Two differences which emerged were the good calcium and less good vitamin C status of the School 2 dinners in comparison with those at School 1. This good calcium status was due to the milk component of the dinner, while the poor vitamin C content of the mashed potato was due to prolonged warm holding.

TABLE 2: Summary data for school lunches in Schools 3 and 4

	Day	No. of children	Lunch[1]	% of children not taking Sandwich/ bun	% of children not taking Milk	Lunch uneaten (%)[2]
School 3	1	99	CS	12	3	4
	2	105	BS	12	2	9
	3	99	B	18	0	8
	4	103	BS	11	0	6
	5	101	B	16	0	9
	6	96	CS	11	0	9
	7	102	B	18	6	13
	8	108	BS	0	0	7
School 4	1	99	B	21	3	5
	2	102	CS	7	5	5
	3	102	B	9	4	4
	4	105	CS	27	3	22
	5	96	CS	19	11	5
	6	92	BS	22	4	3
	7	105	B	15	2	4
	8	104	BS	4	3	3
	9	95	B	15	2	2
	10	94	CS	30	9	6

[1]CS = cheese sandwich; BS = corned beef sandwich; B = bun
[2]Weight basis; soup excluded

Acceptability of lunches—Schools 3 and 4

The lunches in these schools included milk as well as soup and sandwiches/buns. A summary of the acceptability is given in Table 2. Both were boys' schools with age ranges of 4-8 (School 3) and 8-12 (School 4). The sandwiches were made from either corned beef or cheese. There was a relatively large percentage of children not taking sandwiches/buns on most of the test dates especially in School 4. In contrast the acceptability of milk was higher. Most of those who took lunch ate it, with the percentage uneaten ranging from 2 to 22%. It is important to note that from 14-16% of children took a second sandwich/bun on the different test dates, and from 3-17% took an extra carton of milk. The items in the school lunch most disliked by the School 3 children were mushroom, chicken and tomato soups as well as sandwiches. Cheese was also frequently disliked and some children did not like the currants in the buns. Overall, the lunches were well accepted but the percentage of children refusing lunch was somewhat disquieting. The consumption of soup in School 3 was estimated at between 70 and 90%, with brown soups preferred.

The fact that so many School 4 children refused a sandwich/bun, and especially a cheese sandwich, prompts the question as to whether cheese sandwiches should be discontinued and replaced by another filling such as ham, cooked sausage meat or roast beef.

Total food intake

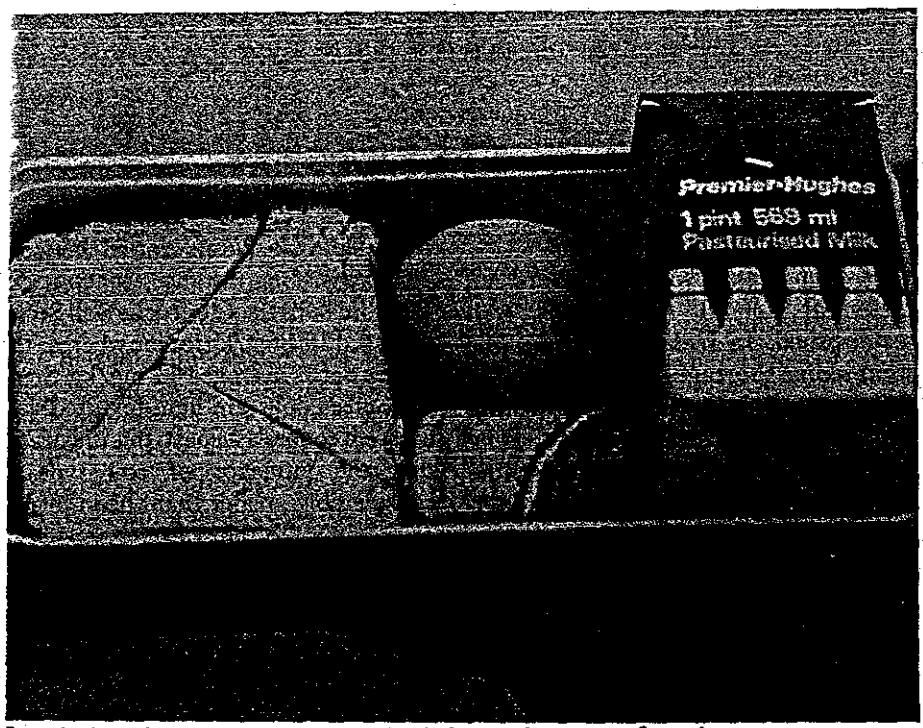
This was assessed subjectively based on the 'overview' of each child's total (home and school) food intake in terms of quantity and nutritive value obtained at the 10-minute interview. The data suggest that most children had a moderate to good food intake and some a 'very good' intake. From a nutritional point of view, 25% were in the poor category, 65% in the moderate category and only 9% in the good category. The generally low nutritional rating was based on the dislike of vegetables and some other items by many of the children, and on the emphasis on burgers, chips and sausages during the interviews. However, potatoes which have a good nutritional status were often liked.

Weight/height for age

The 'percentile' approach is used to

highlight these effects. The percentiles themselves are based on weight/height for age distributions for large populations of children and correspond to actual weight and height values. In the case of weight, 56% of the children in the current study were below the 50th percentile indicating a degree of underweight (Table 3). However, this was not extreme except for School 1 males and School 5 females, where a high percentage of children were below the 50th, 25th and 10th percentiles (Table 3). However, in School 1 the total number of males (at 21) was small and could easily confuse the result.

The same patterns prevailed for height, i.e., 58% of children overall were below the 50th percentile indicating a degree of undersize. The problem was more acute for male and female children from School 1 and for female children om Schools 2 and 5.



Lunch should provide one third of the daily requirements of nutrients.

Summary

1. Overall, dinners/lunches were well accepted. However, the dislike of cheese raises questions about its inclusion in school lunch sandwiches.
2. Taken over the five schools, the data showed that many of the children were slightly underweight and slightly undersized when compared against Irish Clinical Growth Standards. However, there was a more serious underweight situation for males from School 1 and for females in School 5. Presumably this reflects a poor dietary regime and/or poor eating habits.
3. It is recommended that further funds be made available in order to integrate the results of this study with those from school meal studies in other countries and to develop a school meal blueprint and a fully costed action plan, based on factual information.
4. A nutrition education programme for children and parents is a top priority, with emphasis on breaking the 'chips/burger/sausage' dominance.
5. It is important to continue to make policymakers, politicians and those controlling finances more aware of the requirement for research in the poverty, nutritional status, growth/health area, and also for boosting funds to ensure that ongoing aid/education programmes can be continued and upgraded.

TABLE 3: Percentages[1, 2] of children below and above the percentiles for weight and height

	School								
	1		2		3	4	5		
Percentile	Male	Female	Male	Female	Male	Male	Male	Female	Overall
Weight									
<3	0	3	0	0	4	1	1	0	2
<10	24	10	13	6	8	9	7	20	10
<25	42	33	35	22	25	27	23	39	29
<50	71	63	45	50	53	53	49	83	56
>50	29	37	55	50	47	47	51	17	44
>75	0	9	16	22	17	20	34	12	20
>90	0	0	0	6	5	9	17	7	8
>97	0	0	0	0	0	3	10	5	3
Height									
<3	5	3	0	6	8	2	4	2	4
<10	19	13	6	6	15	7	7	10	10
<25	48	27	52	22	30	30	24	27	31
<50	76	60	58	67	55	56	50	68	58
>50	24	40	42	33	45	44	50	32	42
>75	0	20	16	6	9	18	26	12	15
>90	0	7	3	0	0	7	10	10	5
>97	0	0	0	0	0	1	3	2	1
No. of children	21	30	31	18	100	137	70	41	448

[1]Data across all age groups

[2]Data obtained by comparing weight/height/age values for the children against the Clinical Growth Standards of Hoey *et al* (*Acta Paediatrica Scandinavica*, Supplement 338, 1987).

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