

Department of Health

Report on Health and Social Subjects

**33**



# Third Report of The Sub-committee on Nutritional Surveillance

Executive Summary

Committee on Medical Aspects  
of Food Policy

Her Majesty's Stationery Office

Department of Health

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First published 1988

ISBN 0 11 321177 5

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# Preface

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This document is a summary of Third Report of the Committee on Medical Aspects of Food Policy Sub-committee on Nutritional Surveillance covering the period 1981-1985. The full version of the Report was placed in the Parliamentary Libraries on 27 October 1988.

The Committee on Medical Aspects of Food Policy set up the Sub-committee on Nutritional Surveillance in 1971 to assess the changes at that time in the provision of welfare and school milk and of school meals. It published its First Report in 1973<sup>1</sup>. The Sub-committee produced a Second Report in 1981<sup>2</sup> which dealt with the effects of free school milk on the growth of children and the effect of entitlement to a milk supplement in pregnant mothers and their children. It also gave the first results of the National Study of Health and Growth of primary schoolchildren and the results of other surveillance studies on primary and pre-school children.

In its Second Report the Sub-committee made a number of recommendations, among which they suggested that surveillance studies, along the lines it had already established with children, should continue and should be expanded to cover minority groups of people in areas of high unemployment or with a large proportion of immigrants. As a result the studies of primary school children by the National Study of Health and Growth were extended, and the study expanded to increase the numbers of children from ethnic minorities and inner city areas in England. Other studies of pre-school children were also carried out.

This Third Report of the Sub-committee is an account of the methods and findings of these studies. Each study is reported separately by those from whom the work was commissioned. The final section gives the recommendations of the Sub-Committee.

Thanks are due to the members of the Sub-committee on Nutritional Surveillance. I am grateful for the generous way in which they have given of their time and expertise.

**Donald Acheson**

Chief Medical Officer

Chairman of the Committee on Medical Aspects of Food Policy

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<sup>1</sup> Department of Health and Social Security 1973. First Report by the Sub-committee on Nutritional Surveillance. London, HMSO.

<sup>2</sup> Department of Health and Social Security 1981. The Sub-committee on Nutritional Surveillance: Second Report. London. HMSO.

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# Sub-committee on Nutritional Surveillance

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# 1. Introduction

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## 1.1 Terms of reference of the Sub-committee on Nutritional Surveillance

1.1.1 To advise the Committee on Medical Aspects of Food Policy of the measures that should be taken to detect any harmful effect upon the nutritional state of the community of recent changes in welfare milk, school milk and school meals at a time when these effects are mild and reversible.

1.1.2 To consider the long-term arrangements that would be required to enable predictions to be made of the nutritional effects of changes in Government policy, whether social, economic or otherwise.

## 1.2 General background to the Third Report

1.2.1 *School meals:* At the time of the Second Report of the Sub-committee in 1980, the Education Act (1980) was passing through Parliament. Section 22 of the Act removed from Local Education Authorities in England and Wales their statutory duty to provide a mid-day meal which met certain nutritional standards for every child at a maintained school on every school day. Instead Authorities were given discretion over the charges for, and the type of, school meal they provide. They were required to make free school meals available for children from families in receipt of Supplementary Benefit or Family Income Supplement, and had the power to extend this provision to other children perceived to be in need.

1.2.2 In Scotland, prior to the Education (Scotland) Act 1980, Local Education Authorities were expected to ensure that the school meals they provided were suitable as the main meal of the day, and “so planned as to secure variety and a nutritious and balanced diet appropriate to the age of the recipients”. Unlike those in England and Wales, the Regulations did not lay down specific levels for energy and protein. After the Education (Scotland) Act 1980, Local Education Authorities in Scotland were left completely free to decide the form and content of school meals, but they had to provide free school meals to children from families receiving benefits as in England and Wales.

1.2.3 Free school meals have therefore continued to be provided for those groups in England, Wales and Scotland. The Social Security Bill (1986) will require free school meals to be provided only for children from families in receipt of Income Support (the successor to Supplementary Benefit). Those from families in receipt of Family Credit (the successor to Family Income Supplement) will no longer receive free school meals, but the rates of benefit will provide cash help instead. Family Credit will be more generous than Family Income Supplement and reach more families. At the same time the discretionary power of Local Education Authorities to provide free school meals to other children will be ended.

1.2.4 *Milk*: The Report of the Panel on Diet and Cardiovascular Disease of the Committee on Medical Aspects of Food Policy (COMA), published in 1984 recommended that individuals over the age of five years should reduce their intake of total fat and saturated fatty acids to 35 per cent and 15 per cent of food energy respectively. In order to achieve this recommendation for fat the Panel noted that families may elect a switch from whole cow milk to semi-skimmed or skimmed milk. A reduction in milk consumption was not recommended as it is a rich source of calcium and riboflavin.

1.2.5 Under the provisions of the Education (No 2) Act (1980) and the Education (Scotland) Act, 1980, Local Education Authorities are no longer under a statutory obligation to provide free school milk and, if milk is provided, Authorities have the discretion to charge for it.

1.2.6 Under a European Community scheme, introduced in 1983 by Council Regulation (EEC) No 1842/83, a subsidy is payable on certain milk and milk products supplied to school children. In schools with canteen facilities subsidy may be paid on a maximum of 0.5 litres of milk and/or milk products (in milk equivalent), and in schools without canteens on 0.25 litres per child per day. The scheme is administered in Great Britain by the Intervention Board for Agriculture Products (IBAP), and in Northern Ireland by the Department of Education for Northern Ireland. Subsidy may be claimed by a group, association or Local Authority applying on behalf of the schools in which these milks and milk products are distributed. Although participation in the scheme is optional, about 10 million children in about 37,000 schools in the United Kingdom receive subsidised milk and/or milk products.

1.2.7 *Welfare milk*: Welfare foods were administered by Health Departments, and the position in 1985 with regard to welfare food was practically unchanged since 1979. There had been no change in the entitlement to welfare foods since December 1979 when the entitlement to free milk and vitamins was withdrawn from large young families (ie expectant mothers with two children under school age, and families with three or more children under school age) not receiving Supplementary Benefit, Family Income Supplement or in need because of low income. It is estimated that in England about 892,000 children were beneficiaries of free welfare food tokens in 1985.

1.2.8 *Methods of surveillance*: Under its terms of reference the Sub-committee advises on "the measures that should be taken to detect any harmful effect upon the nutritional state of the community of recent changes". Nutritional state may be taken to comprise those aspects of general health which can be causally related to the types and amounts of food consumed by members of the community and which can be affected for better or worse by changes in the diet. The Sub-committee considered that growth was the most useful indicator of nutritional status. Attained height and weight can be measured easily and accurately without too much inconvenience or discomfort to the individual. There is no doubt that poorly nourished children grow more slowly on average, and probably become smaller adults, than those who are well nourished.

1.2.9 With this in mind, the Sub-committee noted in its Second Report in 1981 that there were secular trends towards increasing heights and weights in children from 1905 to 1959 and concluded that although better nutrition was involved, this better growth was also a consequence of better housing, more exercise and greatly reduced rates of infectious disease. However the Sub-committee was concerned that obesity had become more common among children. Increasing average weights could therefore represent a deterioration in nutritional status rather than an improvement. It is partly in consideration of this possibility that this Third Report presents the results of the Sub-committee's more recent surveillance studies of health and growth, both long and short term.

1.2.10 In its Second Report the Sub-committee recommended that surveillance of school children along the lines it had already established should continue, and when the Education Act, 1980 became law, Ministers agreed that a dietary and anthropometric survey of a nationally representative sample of British school children aged 10/11 and 14/15 years be undertaken. The fieldwork took place in 1982 and over 3,000 school children were studied. A preliminary report of the nutritional results of the survey was presented by the Sub-committee to the Committee on Medical Aspects of Food Policy who asked for further analyses, but recommended that, in the interim, a preliminary report should be published. This Report was published in April 1986 and showed that British school children were taller and heavier than ever before and there was no evidence of under nutrition. Average energy intakes were about 90 per cent of the 1979 DHSS Recommended Daily Amounts (RDA). This was deemed to reflect decreased energy expenditure due to the reported decline in physical activity by the British population over recent years. There was no evidence to indicate that their intakes were inadequate, or that on average the children were underweight. Some were overweight. A small minority, particularly girls aged 14 and 15, claimed to be dieting. On average other nutrient intakes were above the DHSS RDA, but the distributions of intakes show that some children, especially girls, had low intakes of iron, calcium and riboflavin. The low iron intakes were in line with similar findings from other surveys. The DHSS RDAs are intended for groups of people, and there will always be some individuals with requirements below these amounts. In any group of people there will therefore be some with nutrient intakes below the RDA, but this does not necessarily imply the presence of a dietary deficiency. The 1979 RDA have been widely criticised for being out of date and COMA has set up a Panel to review them.

1.2.11 The Preliminary Report also showed that children's nutrient intakes were not affected by being in a family receiving benefits, by social class, or by being in a one or a two parent family. School meals, where provided, were an important factor in the diets, particularly of older children, but overall energy and nutrient intakes did not vary much according to lunchtime eating practice. Overall fat intakes were 37-39 per cent of dietary energy, but school meals provided over 40 per cent of dietary energy as fat. There is scope for improvement to bring lunchtime eating patterns more into line with the recommendations of the Report from COMA on Diet and Cardiovascular Disease that overall fat intakes be reduced to 35 per cent of dietary energy. Since 1982, public awareness of criteria for healthy eating has risen and there are indications that the School Meals Services of individual LEAs are re-evaluating and altering their meals and menus. As older children who ate out of



school, at cafés, take-aways and similar establishments chose meals which were low in many nutrients, the overall nutritional quality of their diets was the poorest of any survey group; these children could benefit from nutrition education. Further dietary analyses of the survey data have been commissioned by the Sub-committee and will be reported.

1.2.12 This Third Report of the Sub-committee contains results from the National Study of Health and Growth of two studies on ethnic minorities and inner city areas and on the growth of primary school children. A summary of the main findings of each of these is given below.

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## **2. The National Study of Health and Growth: Surveillance and Research into the Growth of Primary School Children since 1972**

**by R J Rona\*, S Chinn\* and W W Holland\***

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### **Summary**

2.1 This report shows the changes that have taken place in the 10 year period of the National Study of Health and Growth (NSHG) by comparing demographic data and growth patterns in three surveys; the first survey in 1972, the sixth survey in 1977 and the eleventh survey in 1982.

2.2 The response rate has not deteriorated over time even though there have been social and demographic changes in the circumstances of families of primary school children during the 10 year period. The proportion of children whose fathers are in non-manual social classes has increased, the rate of unemployment has increased and the number of children in the family has diminished in England. In Scotland these changes are different only in so far as the main decrease may be in social class IIIM while in the other social classes the trend has been less consistent.

2.3 The secular trend towards taller children has continued during the period in England and Scotland and was not due to the proportionate decrease of children with a large number of older siblings or the proportionate decrease of children from manual social classes. There was no firm evidence that the differences in height between children of different social classes or number of older siblings have decreased or increased over time. On the other hand the difference in height according to employment status has tended to decrease in England but this tendency did not reach statistical significance.

2.4 Triceps skinfold measurements suggest that the children studied in earlier years were thinner. There is little evidence, however, that children have continued their tendency towards increased triceps skinfold after 1977 as there are no significant differences in median triceps skinfold or prevalence of obesity between the 1977 and 1982 surveys. Analysis of variance showed that the increase in median triceps skinfold in the 1977 and 1982 surveys was not associated with a change in number of older siblings, with the exception of the increase in skinfolds of English girls.

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2.5 There was a statistically significant trend to increased height of 0.08 and 0.05 cm per cohort for English boys and girls respectively and 0.16 cm and 0.06 cm for Scottish boys and girls. The mean difference in height between English and Scottish children has therefore slightly diminished since the Sub-committee's Second Report and the difference in weight is also considerably reduced. Scottish children in 1982 had greater weights for height than English children, in contrast to 1977.

2.6 No effect of school meals on the rate of growth of primary school children was shown. Uptake was strongly associated with price, with family social background in terms of the mother working outside the home, her educational background, and the father's social class. The parents' perception of advantages and disadvantages of the school meals system is related to social factors.

2.7 Parental smoking at home was significantly associated with children being shorter after allowing for social and biological factors.

2.8 Analysis of the child's obesity and parents' body build and social factors showed that parents' body build and number of children in the family were the factors most consistently associated with obesity.

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# **3. The National Study of Health and Growth:**

## **Nutritional Status of Children of Ethnic Minorities and Inner City Areas in England by R J Rona\*, S Chinn\* and W W Holland\***

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### **Summary**

3.1 The nutritional status, based on anthropometric measurements, of children of inner city areas and of ethnic minorities in England was studied in 1983. The height, weight and triceps skinfold of children were measured and data were collected on the child's health, family social circumstances and selected items of nutritional relevance such as whether the child was in receipt of free school meals and school milk.

3.2 The results are presented for seven groups defined by external appearance and language spoken at home. The groups are Caucasian, Afro-Caribbean, Urdu, Gujarati, Punjabi, "Other Asian" and "Others".

3.3 Compared with the representative national sample of the National Study of Health and Growth, all the groups were more socially deprived. Between forty to fifty per cent of the children in the study were receiving free school meals. The groups from the Indian subcontinent had higher levels of unemployment, larger families, more household overcrowding, and a larger proportion of mothers with a low level of formal education than other groups. The Afro-Caribbean group had a very large proportion of one parent families.

3.4 Each of the ethnic groups, with the exception of the Afro-Caribbean group, were shorter than the national average sample. The Gujarati and the "Other Asian" groups were the shortest followed by the Caucasian and Urdu children. The Punjabi children were nearer to the mean and Afro-Caribbean children were well above the mean of the representative national sample.

3.5 Caucasian children's height was most influenced by parental height, and several environmental factors were also significantly related. The type of school meal, whether free, purchased or prepared at home, was consistently associated with children's height in five out of seven ethnic groups. Children receiving free school meals were shorter than children who did not. The remaining social factors were less consistently associated with children's height. In the Asian groups a lower level of

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mother's education and greater household overcrowding were associated with smaller stature while in the Caucasian sample smaller stature was associated with long term unemployment and the number of children in the family. Despite being taller than children in other groups, Afro-Caribbean children's height was associated with many social factors. In the Afro-Caribbean and Punjabi groups many mothers worked outside the home, and they had taller children.

3.6 There were large differences in triceps skinfold thickness and in weight for height between the seven ethnic groups. Afro-Caribbean children were heavier but had, relative to other groups, a lower median triceps skinfold. The Asian groups were lighter than other groups and the triceps skinfolds of Asian boys were around the 50th centile of the national average sample. The Caucasian children of inner city areas were slightly heavier than the national average sample with a greater median triceps skinfold. While Asian girls had a lower median triceps skinfold, Asian boys were similar to the national average sample.

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## 4. Anthropometric Surveys of Pre-School Children: by P T Fox\* and Elizabeth A Hoinville†

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### Summary

4.1 This Survey of Growth in Pre-School Children was recommended by the Sub-committee on Nutritional Surveillance in order to provide a model for continuous nutritional surveillance of children during the pre-school period. Differences in health status associated with the variety of domestic and social environments experienced by young children were measured.

4.2 There were significant differences between socio-economic groupings in children's attained length which were clearly discernible by two years of age. This measure therefore provides a way of assessing the impact of the socio-economic environment on one of the most vulnerable groups within the community. It is strongly associated with low family income independently of long term unemployment, single parenthood or membership of an ethnic minority.

4.3 These social variables are also associated with significant differences in the morbidity of the children with possible long term consequences for their health. There remains a need to monitor trends in the health and nutrition of pre-school children in a standardised manner, with particular reference to those families who are on low incomes, from single parent households or those from ethnic minorities.

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## 5. Growth and Development in the First Five Years of Life

by P C Elwood\*, O P Gray†, P D P Wood‡, D P Davies§, and P M Sweetnam\*

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### Summary

5.1 This report describes a detailed study of growth in a representative cohort of children in South Wales, followed from early pregnancy to the age of five years. The proportion of families of social classes IV and V in the study was similar to that of England and Wales but that of classes I and II was lower.

5.2 The study had been set up by the Sub-committee, being originally a randomised controlled trial from early pregnancy until the children attained five years of age. The families of a random half of the cohort had been provided with Milk tokens exactly as had been permitted under the Welfare Foods Act until 1979. The results of the trial were fully reported in the Second Report of the Sub-committee in 1981. As there had been no detectable effect of the entitlement to additional milk on growth of the children aged up to five years all subjects were combined into a single cohort and the determinants of growth examined.

5.3 Birth weights, crown to heel length, head circumference and skinfold thickness were measured on all babies and the heights and weights of all mothers and 70 per cent of fathers were also taken. A personality test was applied to each mother and a behaviour questionnaire to each child at age 4½ years. Smoking habits of parents were also recorded — for mothers during the pregnancy.

5.4 Low birth weight was an important determinant of early growth. Children who had weighed less than 2,500 g at birth remained smaller than their peers, to the extent of about nine months growth.

5.5 Social class differences in height were clear from the age of two years and gradually increased thereafter. The difference in height at the extremes of the social class range was small, about 1 cm or 2 per cent at 5 years of age. There was a small difference in head circumference in favour of social class I after 3 years of age, but

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the extent to which this is genetic or nutritional is not known. The parity of the mother had a small effect on birth weight which was lost by age 3 months. Neither family size or birth rank appeared to affect growth rates.

5.6 Maternal smoking during pregnancy affected the growth of their children up to age five years. The diets of the mothers were related to smoking and this may explain part of the association between smoking and growth. Mothers who smoked ate fruit much less frequently than mothers who did not smoke. Mothers who smoked also took more drinks, in particular tea, and took more sugar with drinks. The effect of smoking on birth weight was marked and showed a gradient with the amount smoked, with up to a 9 per cent deficit in weight in babies born to mothers who smoked heavily. The effect declined thereafter but appeared to persist throughout the period of observation. The effect on height was smaller but also persisted, with children of non-smokers tending to remain taller than those of heavy smokers. The effect of smoking on head circumference was clear but small, equivalent to about 2 per cent difference between non-smokers and heavy smokers. However this could be of significance as head circumference is known to be closely correlated with intra-cranial volume and with cellular brain growth.



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## 6. Recommendations of the Sub-committee

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6.1 This Third Report and other work in recent years show that the secular trends in heights and weights are continuing and therefore the reference standards of growth used in Britain (Tanner, Whitehouse and Takaishi, 1966) may no longer be applicable. It is very important to have up-to-date information on growth norms and we have recommended the revision of reference standards for the growth of British children and of ethnic groups and these have been carried out.

6.2 It is still not possible to state that the differences in attained height demonstrated in the studies reported here are dependent on nutritional status (with the implication that they could be modified by selective improvements of diets) or due to innate differences in growth potential. We confirm the conclusions in our Second Report that further information is needed about the nature and significance of differences in physical size and rates of growth.

6.3 Following on from our Second Report we have carried out the surveillance reported here on ethnic groups and inner city areas. Apart from Afro-Caribbean children, those from the ethnic minorities are shorter than the national samples. National surveillance should continue with special emphasis on these important sub-groups.

6.4 Changes in school meals and school milk provision since 1980 do not appear to have had adverse effects on the physique of school children. The preliminary results of the dietary survey of school children show that the heights of children are not dependent on the type of midday meal but some children are probably too fat, and some do not achieve the Recommended Daily Amounts (RDA) of some nutrients. There are no grounds for complacency for, as already indicated, the satisfactory national picture may obscure the existence of pockets of poor nutrition among vulnerable sub-groups. There is a need for continuing vigilance. We therefore endorse the recommendation in both our First and Second Reports that dietary and nutritional surveys of adults and children form the basis of a permanent monitoring service, including where appropriate nutritional biochemical analyses of blood and urine.

6.5 Although school children do not approach their Recommended Daily Amounts (RDA) for energy, they are nevertheless achieving heights and weights above standard. We believe that energy requirements are falling as the population becomes more sedentary. The consumption of energy related nutrients is therefore also falling. In addition there may now be sufficient data on which to extend the RDA to cover micronutrients such as zinc and pyridoxine. We therefore endorse the review of the UK RDA currently being undertaken by COMA.

6.6 The studies included in this Report clearly confirm that maternal smoking during pregnancy is a major determinant of smaller stature and poorer growth of infants. We recommend that public education programmes be extended and aimed at pregnant women to reduce smoking during pregnancy.

6.7 The Preliminary Report of the dietary survey of school children has shown that fat intakes are above those recommended by the COMA Panel on Diet and Cardiovascular Disease. School meals provided 39 to 45 per cent of energy as fat. Provided that energy intakes are maintained there may be scope for improvement by reducing fat contents to bring school meals closer to these recommendations.

6.8 The high fat intakes described in the Preliminary Report were due in some measure to the consumption of chips, crisps, cakes, biscuits, milk and milk products by the children. The current system of differential subsidies for milk and milk products arranged by the European Community for schools could be one of the factors which maintains high fat consumption. The importance of reducing fat intakes among British school children should be a consideration in future negotiations on this subsidy system, with a view to shifting the negative differential subsidies on semi-skimmed milks and low fat yogurts.



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