# Factors Effecting an Obesity Reduction Treatment Programme in a Secondary School

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fulfilment of the requirements for the degree
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The present study examined the effects of a 21 week programme on 9 obese adolescents in a school setting.

The study's theme was chosen because research in the area of adolescent obesity is sparse.

Self monitoring of intake, self monitoring of increased exercise, varying frequency of weighings and continuing instruction in the behavioural control of eating were used.

Varying measures were examined to try to find predictors of the Ss' success probabilities and to describe psychological aspects associated with adolescent obesity.

Significant correlations with weight loss indicated that:

(a) gains in personal adjustment followed weight loss;
(b) California Test of Personality Scores and Primary School Record Personal Effort Scores, were good predictors of success;
(c) degree of self monitoring of intake and degree of family support were closely associated with success;

It was found that:

(d) increased exercise output was an important factor;
(e) trends were present showing improved academic performance following weight loss;
(f) obese adolescents had significantly more absences from school and were high risks for truancy and premature termination of schooling.

These findings were discussed relative to the literature on obesity.

# ACKNOWLEDGEMENT

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# THE PROBLEM

Despite the increasing interest in obesity there have been few reports in the social science literature of studies using children or adolescents as subjects. This is a surprising omission because obesity is a major health problem and carries with it a considerable social disability.

While childhood obesity is not associated with high mortality and morbidity rates (though it is associated with musculoskeletal defects, Heald (1971)), the main health problem lies in its prognosis. Mobbs (1970) suggested that 80% of overweight children grow into overweight adults. His conclusions have been supported by many other investigators.

There is evidence that child onset obesity is of a different kind (hyperplastic) from adult onset obesity (hypertrophic) in that there are greatly increased numbers of fat cells. Though reduced food intake can lead to a decrease in the size of the cells, their numbers cannot be altered. (Knittle, 1971; Hirsch, 1974). It is apparently this which makes child onset obesity much more resistant to treatment than adult onset obesity. This has been noted in a number of studies. It makes the prevention of childhood obesity of particular importance. The critical period for man when his fat cells are laid down appears to be in the last trimester of pregnancy, in the first three years of life and in adolescence. (Hirsch, 1974).

Besides health risks there is considerable evidence of psychological risks for obese children. Stunkard and Mendelson (1967), Stunkard and Burt (1967) and others have noted the negative feelings about themselves that develop rapidly in obese children. Bakwin and Bakwin (1972) commented that obese children were often the recipients of cruel emotional torment from their peers. Werry (1972) noted that the characteristics seen in obese children were typical of persecuted minority groups. Werkman and Greenberg (1967) noted that adolescent obesity was regularly accompanied by personality difficulties of a serious nature.

Socially, obese children appear to suffer markedly.

Wolfgang and Wolfgang (1971) found that people position themselves significantly further from obese and social deviants than from normal subjects. The negative stereotypes appear to develop at a fairly early age. (Lerner and Gellert, 1969; Lerner and Schroeder, 1971(a), 1971(b)). They noted that 86% of their kindergarten children sample reported consistent aversion to chubbiness.

Staffieri (1967) found that eight to nine was probably the time when dissatisfaction with one's own body type begins if it differs from the mesomorphic variety.

Monello and Mayer (1963) found some discrimination in college acceptance particularly for obese females who are only one third as likely to be accepted as their lean counterparts. (Mayer, 1974).

Johnson Burke and Mayer (1956) noted in their study with obese High School girls that the energy imbalance leading to their obesity was associated more with inactivity, than with overeating. In comparison with the lean control group, the obese group stood, groomed themselves and were involved in active sport significantly less and they sat significantly more. Their caloric intake was also significantly less but not to the extent of making up for their inactivity.

There have been many similar results linking inactivity with obesity in all age groups. Mayer (1974) noted that fat babies are more inactive than thin babies. With obese women Davis and Stunkard (1957) found that they walked only half the distance (2.1 miles/day) of their lean counterparts (4.9 miles/day). Similar results have been found with men.

Bruch (1974) commented that the inner resistance to exercise was even stronger than the resistance to food restriction.

Although there have been several reports of individual treatments of obese children and of treatments ..

in hospitals or institutions, there appears to have only been one study reported (Seltzer and Mayer, 1970) of a programme set up within a school for the reduction of obesity. It was with adolescent girls.

On the basis that diminished physical activity was the main differentiating factor between obese and non obese adolescents, the programme primarily involved increased daily vigorous exercise. Some nutritional education was included but no attempt was made to reduce food intake.

The reported results were modest. The mean Ponderal Index gain was .08 compared with zero change for the obese group who had not volunteered to take part. The increase in body weight was 5.13% compared with 8.95% for the non programme obese.

This rate of obesity reduction may have been adequate for the mildly obese and the quoted mean Ponderal Index (12.17) suggests that most in the group were only mildly obese. But a grossly obese adolescent (with say a Ponderal Index of 11.0) would still be grossly obese after 10 years of reducing at the .08 rate!

It seems possible that the actual rate of obesity reduction was less than reported because it was computed as a yearly rate on the assumption that the rate achieved throughout the programme would continue throughout the rest of the year. This seemed an unjustified assumption.

Seltzer and Mayer also notice a disturbingly high 37% who were apparently not helped as their Ponderal Index decreased.

## DEFINITIONS AND MEASURING INSTRUMENTS OF OBESITY

There is general agreement from a theoretical standpoint that obesity is present when the body is loaded with excessive fat. (Mayer, 1968).

On a clinical basis this general definition can be readily interpreted. Regarding children, there is widespread agreement. "A child is obese if he or she is too ...

fat for his or her own good." (Mayer, 1970). This is similar to Woods' (1964) definition: "Fatness should be considered excessive if it interferes with a child's activities and makes him a cause for comment."

These theoretical concepts have been translated into various practical definitions to form the basis of research measuring instruments.

Most commonly obesity has been measured either on an anthropometric basis or on the more direct skinfold measurements of fat mass.

On an anthropometric basis obesity can be measured against tables of average or desirable weight. Knittle (1971) considered a child obese if he or she was in excess of 130% of his or her ideal weight. But there are difficulties in defining ideal weight.

Several studies have used percentiles as the basis for a measure of obesity. Hooper and Alexander (1971) used the 90th percentile as the cutoff point. Seltzer and Mayer (1965) used the 84th, while Keys and Brozek (1953) used the 95th and 99th.

A variation of the anthropometric measures is the Ponderal Index. A person is defined as obese if his Ponderal Index is less than 12.

But such measures are not measures of obesity per se, but of overweightness. Though the two are closely related they are not identical.

Skinfold measurements are a more direct measure of the degree of obesity. Seltzer and Mayer (1965) suggested that the skinfold measurement was the best single criterion of obesity.

But skinfold measurement is relatively insensitive to the daily-weekly bodily changes which provide essential feedback to a person on a weight reducing regimen.

Recently a wide variety of sophisticated techniques have been developed using various chemical and physical measurements.

One of the difficulties in using tests of obesity is that standardisation tables prepared in one country or culture may not relate directly to another. A recent New Zealand study (Department of Health, 1971) investigating the physical development of a large sample of New Zealand children has been most valuable. Particularly relevant are the percentile charts relating weight to height for each sex.

TREATMENT

With the exception of surgical intervention, weight loss can only occur if there is a reduction in intake or an increased expenditure of energy. So the ultimate goal of all treatment programmes for obesity (with the exception of surgery) is the permanent modification either of the obese person's eating patterns so that his caloric intake can be reduced, or of his exercise patterns so his expenditure can be increased.

Surgical intervention has so many attendant risks including death (Payne, De Wind and Commons (1963), noted a mortality rate of 6%), that it has been suggested that its use be discontinued, (Drastic Cures for Obesity, 1970), or at least be used with caution and only in cases of intractable massive obesity. (Welch, 1973; Cook and French, 1970). It is certainly not a treatment to be considered with adolescents.

The alternative medical approach, drug therapy, has value only as an initial "crutch" in helping motivated people change their eating habits. (Leon, 1976).

Dietary approaches have been found to be successful so long as the patient is in a controlled environment such as a hospital but maintenance of the weight loss following discharge has proved extremely difficult. Alley, Narduzzi, Rabbins, Weir, Sabeh and Danowski (1968), found that over a 1-5 year follow up of 50 overweight children, only 28% had lost 5 lb or more. But 82% were still above the 90th percentile.

In a study of 15 obese adolescents on a total fast Nathan and Pisula (1970) noted that all but two had regained...

weight after leaving hospital and all but four had regained or exceeded their admission rate. Similar results have been reported with adults.

Regarding the traditional psychological approach of individual or group psychotherapy, the results are difficult to analyse because the literature is predominantly of case reports. But Leon (1976) comments that using traditional treatments "weight loss and weight maintenance results with children and adolescent populations, have been uniformly poor."

With adults the most promising treatments have been the various behaviour modifications approaches. But there have been no studies reported, using as subjects children outside of institutions. Stimbert and Coffey (1972) suggest that the absence of children is because such procedures must essentially be applied to both the child and to his parents. This together with the lack of concern commonly noted in parents, greatly adds to the complexity.

Additionally it is generally agreed that children and adolescents should not be given severely restricted diets because of possible growth impairment. (Goldbloom, 1968).

Many of the early behavioural studies were aimed at comparing behavioural techniques with more traditional treatment methods, generally with results significantly favouring the newer techniques. (Harris, 1969; Penick, Fillion, Fox and Stunkard, 1971; Stuart, 1967, 1971; Wollersheim, 1970).

On the whole, classical conditioning procedures have produced smaller weight reductions than operant techniques. It may be that this was because the reactions produced under the respondent paradigm were not sufficiently strong to offset the powerful reinforcing effects of eating. (Stuart and Davis, 1972). Whereas the operant environment control procedures placed specific emphasis on learning how to change permanently one's eating pattern. (Leon, 1976).

Recent behavioural studies have aimed at finding out the most effective components of the behavioural treatments. Stuart's (1971) results pointed to the importance of intensive instruction in environmental control procedures. This needed to be extended to periodic follow up visits. Various studies have investigated aspects of contingency contracting, with varying results. High attrition rates were reported in one study using contingency contracts. (Harris and Bruner, 1971).

It has been demonstrated that a behavioural programme presented in a manual was as effective as exposure to the material in a group setting. (Hagen, 1974).

Monetary rewards have been found not to add to the effectiveness of situational management procedures. (Abrahms and Allen, 1974).

Therapist directed goals and therapist controlled reinforcement have been found more effective than self control procedures. (Hall, 1972).

Self monitoring of both weight and caloric intake has been found as effective as behavioural management or stimulus control techniques. (Romanczyk, 1974).

Bellack, Rozensky and Schwartz (1974) highlighted the importance of monitoring intake and found premonitoring more effective than postmonitoring.

Despite the promising nature of the behavioural techniques there have been very few follow up studies. A number of studies have involved moderately overweight college females and it is questionable whether obese adolescents would be as cooperative in recording their daily behaviours.

There was no physical or medical fitness testing programme at the school, from which a list of obese children could be obtained. E therefore approached teachers for names of Junior students whom they considered could benefit from taking part in an obesity reduction programme. The basis of their judgment was to be appearance and/or allied impairment of physical activity.

From the names given a list of 23 pupils was formed. E approached them individually and invited them to participate. 13 pupils showed interest and E then sought their parents' consent. Two of this group left school soon after showing interest in the programme. Two others withdrew from the programme shortly after it began.

As E made the initial contact he made a subjective evaluation of the degree of obesity of each candidate. E attempted to do this again with those who did not take part about the time the programme ended.

## MEASURING INSTRUMENTS USED

Various measuring instruments were used, some on a pre-post test basis.

Medical Measurements were conducted by an independent researcher but were not strictly part of this study, except insofar as they established the degree of the S's obesity, that his obesity was functional, and that he could appropriately be included in the programme.

The initial medical assessment included weight, height and skinfold measurements, a brief general examination, and blood tests. The final tests included weight and height measurements, blood tests and skinfold measurements.

The degree of a S's obesity was determined using the weight-height percentile charts from Physical Development of New Zealand School Children, 1969. (Department of Health, 1971, pp.57-58). Obesity was considered to be moderate to gross depending on how much a S's weight exceeded the 97th percentile weight correlated to height and sex.

Figure 1 shows the construction used for calculating the 97th percentile weight for K's initial height (163 cm). A vertical line was drawn from 163 cm. The vertical coordinate of the intersection point of this line and the 97th percentile curve, gave K's initial 97th percentile weight (69.8 kg). This was converted to pounds (154), enabling the determination of the extent of K's weight (159½ lbs) above the 97th percentile (5½ lbs).

Pounds were used instead of kilograms to facilitate comparison with the literature.

A similar calculation was done following the final medical measurements enabling the 97th percentile to be calculated for his new height. On the assumption that height growth was constant for the period of the programme a sloping straight line could be drawn on the S's graph. From this graph the S's weight above the 97th percentile could be calculated for any time. The improvement in obesity was taken to be the difference of the initial weight above the 97th less the final weight above the 97th.

When comparing results between S's the calculated loss relevant to the 97th was used. When comparing the same S's progress under different schedules it was usually sufficient to use the simpler absolute weight loss as the criterion.

The Ponderal Index was also calculated and this was in order to compare it with a previous study. (Seltzer and Mayer, 1970).

It was hoped that skinfold measurements could be used as a criterion of the lessening of obesity, but pressure regulated callipers were not available.

STANDARDISED TESTS

California Test of Personality, 1953, Revision, Secondary Form AA (McGraw-Hill) was used as a pre-post test to measure Ss personal and social adjustment. Werkman and Greenberg (1967) found that obesity was regularly accompanied by consistent personality ...

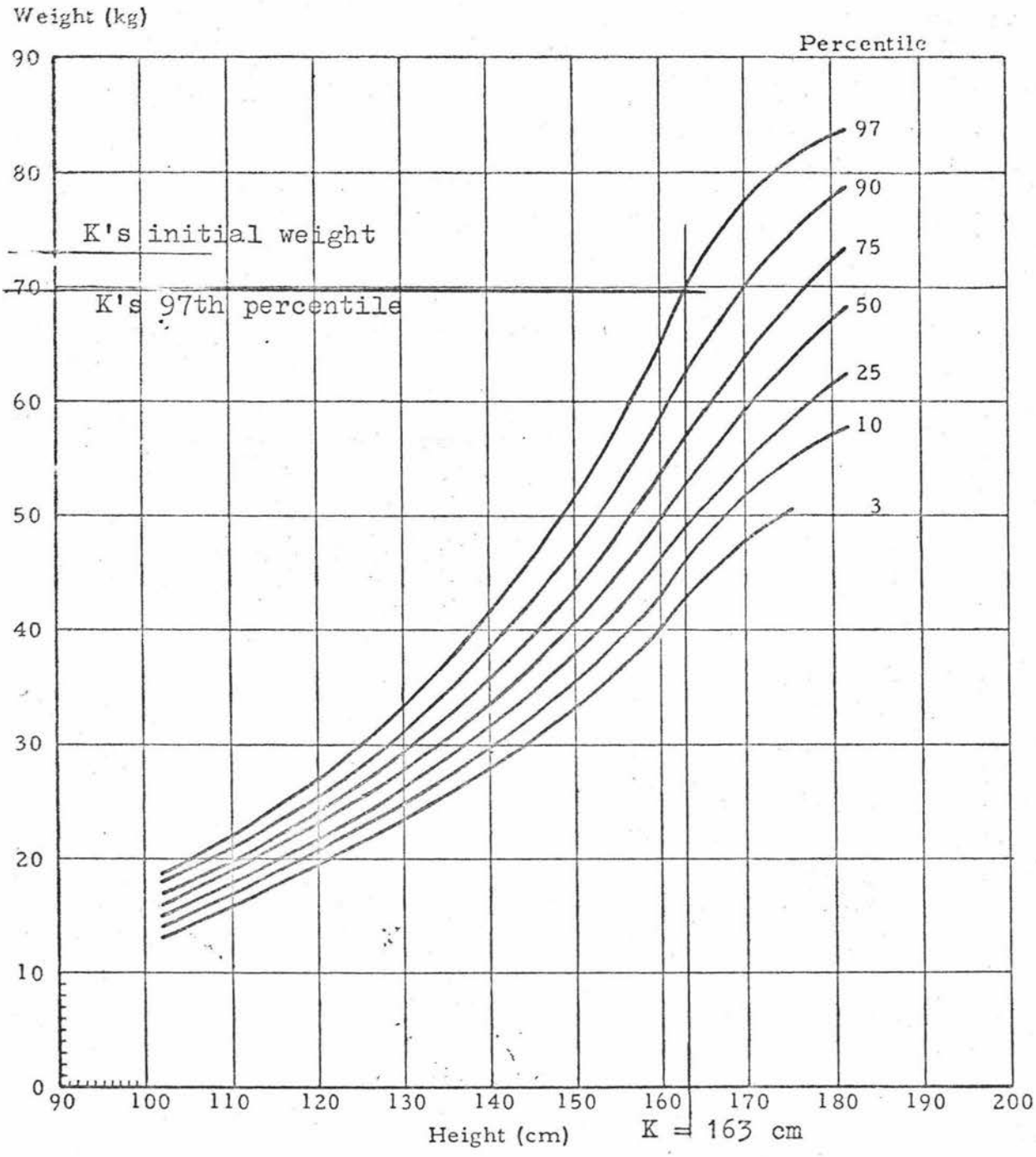


Figure 1

Construction to show the 97th percentile for boys of K's initial height (163 cm) using Figure 40, Physical Development of New Zealand School Children, 1969, (Department of Health, 1971).

difficulties of a serious nature. While some other investigators failed to find "reliable personality differences between the obese and non obese" (Stimbert and Coffey, 1972), it was hoped that the California Test of Personality might indicate results in line with Werkman and Greenberg's conclusions.

It seemed possible that as an obese child loses weight there would be a corresponding improvement in his self image and personal and social adjustment. A number of commentators had noticed such improvements following weight loss in adults. But Stunkard and Burt (1967) noted that adults whose obesity originated in childhood maintained their negative evaluations of body size or shape, irrespective of their body size. It was hypothesised that gains in the California standard scores, particularly of the Personal Adjustment Section, would correlate highly with weight loss, indicating support for the hypothesis that improved self image would follow successful weight loss.

It was hypothesised also that scores in the initial California Personal Adjustment Section and the Family Relations subscore, could both have a high predictive value of success in the obesity reduction programme. For a S to persevere over a long period of time, essentially for rewards that are somewhat delayed, would seem to demand a reasonable degree of personal security and social adjustment. Likewise the ability of the family to give support in restructuring the food environment, would seem to be particularly important.

Hence the Personal Adjustment Standard Score, and the Family Relations Subtest Standard Score were both correlated with subsequent weight loss.

The California test was selected as the instrument to assess personal and social adjustment because it had been standardised on a small sample of New Zealand children and as a result was widely used by the Department of ...

Education's Psychological Service. It was generally agreed that scores at or below the 10th percentile were a clear indication of emotional disturbance. (D.G. Page personal communication, June 1976).

The Bristol Social Adjustment Guide No.1: The Child In School (Stott, D.H., and Marston, N.C., 1970), was used as another pretest posttest measure of the S's social adjustment. If the Ss were exhibiting social difficulties, these would be observable by their teachers.

Each S's form teacher, being the one who presumably would know the S best, was asked to complete the Guide at the start of the programme and again at the programme's conclusion.

If there were any marked changes in social adjustment in the course of the programme, these presumably would be reflected in the posttest.

Werkman and Greenberg (1967) noted a constellation of depression, anxiety and bodily concern in their study of adolescent girls. Other writers such as Steel (1974) noted that a depressive reaction was common in obese adolescents. If this was true then the Bristol scores should be high in Depression subscores and total Under-reaction.

Bruch (1957) noted that excessive eating was one of the principal outlets for aggressive hostile feelings and that this was one of the only ways, the child knew how to handle most traumatic experiences, failures and disappointments. Insofar as such comments were generally true it would lead to expectations of high scores in Hostility subscores.

OTHER MEASURES

Sociogram

A number of writers have shown that obese children tend to experience considerable rejection from their peers. There is also limited evidence to suggest that as an obese child's weight returns nearer to normal, so he comes to experience more acceptance.

With this in mind a modified Sociogram was prepared and administered prior to the programme commencing, to those classes including a S. The Junior classes were re- ...

administered the Sociogram at the programme's conclusion.

An "unpopularity rating" was made for each class member by subtracting the "like" score from the "dislike" score. Classes were then ranked. The ranking as a fraction of the number in the class, was then expressed as a percentile to facilitate comparison between S's.

The Sociogram asked pupils to list the "four people from the class you would MOST like to be with you at a party." It then asked them the "four people from the class you would LEAST want to meet there." It was not necessary to find out all the relationships involved but only to determine the unpopularity of each S relative to the other class members. Hence no one was asked to reveal his identity or sex.

It was administered so that it in no way seemed linked with the Obesity Reduction Programme.

FAMILY EATING PATTERNS QUESTIONNAIRE

It seemed likely that those adolescents who would do best in the obesity programme would be those who would experience most family support.

To reprogramme successfully a S's food patterns seemed to involve reprogramming the S's whole family's food environment. Eliminating cues involved establishing where the family eating took place, the kinds of food brought into the house and made freely available. Supressing cues involved firstly that the family provide positive cuing of desirable behaviours, (one cannot both offer food and cue its refusal), and secondly, it involved the family providing positive reinforcement for acceptable eating, in place of the more familiar and troublesome attacks upon the overeater's lapses.

The questionnaire (See Appendix I) was constructed in an attempt to assess the extent to which the family was supporting the S in this way. It was administered to the group during week 6 just prior to the August holidays. ...

At the completion of the programme, the questionnaire scores were compared with S's weight losses.

MEASURES OF SCHOOL SUCCESS PRIOR TO ENTRY INTO SECONDARY SCHOOL

Two sets of data were obtained from the S's school records.

(i) The Otis Mental Ability Test Scores:

This is a group test given by the Primary Schools to all pupils immediately prior to their enrolling at the Secondary School. In most New Zealand Secondary Schools the Otis score is the only data in pupils' records which purports to give some indication of their intellectual ability.

In a non institutional setting success in an obesity programme involves the S's ability to reprogramme his eating environment. It seems likely that ability to do this would be related to intellectual ability. Hence the Otis scores were obtained.

(ii) Personal Effort Scores:

This score is part of the data passed on to the Secondary School by the contributing Primary School. The Personal Effort Score is taken from a 10 point scale and represents the subjective evaluations by the teachers of a child's motivation and the amount of effort he puts into his school work.

It was suspected that in an Obesity Programme which would demand considerable persistence over a long period of time, the Personal Effort Score might be a good indicator of success.

At the conclusion of the programme, both these scores were correlated with weight loss.

OTHER MEASURES

School Registers

The school registers for the year were checked for each class which included a pupil who had begun the programme. The number of half days absent each term were ...

noted for each pupil (689 pupils).

In addition the school form lists were checked to note the numbers of Junior pupils who terminated their education in the period from when the S's were approached, to the end of the programme immediately prior to the end of the school year. Those who completed the school year before leaving were not noted.

It was surmised that obese adolescents tend to be absent from school more frequently and are more at risk with respect to truancy and premature termination of their schooling.

SCHOOL REPORTS

It seemed possible that as an obese pupil succeeded in losing weight, the success might generalise into improvement in his academic record.

To check this possibility the school reports of the junior Ss were examined. (It was not possible to include the 5th formers because no comparable report was issued for the 3rd term). It was planned to compare the 1st term's reports (unaffected by the programme) with the 3rd term reports (possibly influenced by the programme).

The reports of the five Junior obese pupils who had declined to take part in the programme, were also examined with a view to comparing the performance of those who participated and those who did not.

For each S's report, numbers were assigned to each of the subject grades on the basis of A (Excellent) = 5, while E = 1. A total score for the S's term report was obtained by adding up the grade scores. Then each S's first term report's score was compared with the S's third term report score, noting the difference between the totals.

If success in weight loss generalised to improved academic performance, then a high positive correlation would be expected between increased report scores from the first to the third term, and weight loss.

## STRUCTURED INTERVIEWS

A questionnaire was produced aimed at eliciting precise information about each S's eating, exercise and social patterns. (See Appendix B). This was used as the basis of a structured interview with each S prior to and at the conclusion of the programme.

## WEEKLY WEIGHINGS COMPARED WITH 4 WEEKLY, DURING THE SCHOOL HOLIDAY PERIOD

Craddock (1972) considered that the optimum time between follow up visits for obesity patients to their medical practitioner was a fortnight. Most commercial groups such as "Weightwatchers International" hold weekly meetings. The school holiday period (weeks 7-10) presented an opportunity to compare the value of weekly weihings with 4 weekly weighings. Ss were divided into two subgroups. Three Ss were going to stay in the city and who were available to be weighed weekly formed the weekly subgroup. The other six Ss formed the monthly subgroup. After the holidays the weight changes of the two subgroups were compared for weeks 7-10. If weekly weighings were superior the weight loss of that group should be clearly bigger.

The programme aimed at weight reduction using various behavioural techniques:

(a) Self Monitoring of Intake:

Each S was given a daily sheet on which to record his intake. (See Appendix C). It was assumed that this would be post-monitoring because post-monitoring was more likely to be completed successfully than pre-monitoring. Monitoring of food intake was to begin from the start of the programme and continue to week 11.

(b) Instruction on establishing behavioural control of eating:

This was to be given at the Parent's Evening and on a continuing informal basis at the weighing contacts. (See Appendix D).

(c) An exercise programme was to be arranged with each S individually. It would be of a type that S would enjoy most, and be most likely to persevere with. It was to be self monitored daily on sheets provided. (See Appendix C). The exercise programme was emphasised from week 11 onward. To assist in the planning of the Ss' programmes, they were each given a copy of "Mean Energy Expenditure of Various Activities" (from Stuart and Davis, 1972, pp.236-237). (See Appendix E). This was used to calculate the approximate increased expenditure resulting from the increased exercise and hence the contribution it would make to weight loss.

The suggested daily caloric intake was between 1000-1400 calories. This was to be discussed at the Parent's Evening where written material about the diet and dieting was to be distributed. (See Appendix F).

Contact with E was initially to be weekly, and from week 12 more frequently. The contacts were for weighing, collection of monitoring sheets and for continuing instruction.

Weight changes were recorded at each contact time on individual graphs (See Appendix G) which were to be taken home, and on a master graph which showed the weight changes of all Ss and enabled visual comparison between Ss' progress.

E himself was to participate in the programme. This was primarily because he was marginally obese but it was also assumed that the modelling effect would be valuable.

Each S was following a multiple $AB_1B_2B_3...A$ design which enabled each to function as his own control. To make the programme easier to manage the changes of schedules for all Ss occurred simultaneously.

DESCRIPTION OF THE PROGRAMME

The programme began after the initial interviews and tests had been completed.

Week 0: Initial Medical Check:

This was conducted at the school by a Paediatrician. A brief general medical examination was given, aimed at excluding a possible medical basis for the obesity. Height and weight measurements were noted, on which basis the degree of overweightness was calculated. Blood tests were taken in the week following.

Weeks 1-2: Baseline Period:

Each S was asked to eat normally but monitor his daily intake on the sheets provided and hand these in to E.

Week 3: Parent Evening:

Ss and their parents were present. A hospital dietitian discussed the suggested diet. (See Appendix F). E then discussed behavioural controls of overeating. (See Appendix D).

Weeks 3-4: Self Monitoring of Daily Intake:

Weeks 5-10:

Self monitoring of daily intake using recording sheets which indicated the food quantities allowed in the suggested diet. (See Appendix C). Over the holiday period (weeks 6-9) Ss were expected to continue the self monitoring and post their sheets to E in stamped addressed envelopes provided.

Weeks 6-9: Holiday Subgrouping:

Ss were divided into a weekly weighing subgroup, who were weighed each week of the holidays, and the non weighing group.

Week 8: A letter was sent to all Ss' parents with the aim of maintaining their support. (See Appendix H).

Weeks 10-11: Exercise Schedule:

Each S was asked to commit himself to a programme involving at least 15 minutes extra exercise daily and monitor on the sheets provided. (See Appendix C).

Weeks 12-13: Twice weekly weighings:

Weeks 14-16: Daily weighings:

Weeks 17-18: Daily weighings plus weekend intake monitoring.

Week 18: Final Medical:

This included height and weight measurements and was followed by blood tests in the following week.

Weeks 18-22: Baseline.

During the five months a number of school events were encountered which impinged on the programme:

| | |
|---|---|
| Weeks 5-6 | Fifth Form Examinations |
| Weeks 14-15 | Fourth Form Examinations |
| Weeks 19-21 | School Certificate Examinations |

Several Ss were involved in class camps.

Weighing was at "Review Time" which was at the start of the day. But two Ss were bus pupils which meant their always missing Review Times. Hence they had to be weighed at times when E was free so their weighing times varied. Ss were careful to weigh in the same clothes.

Broadly the programme was in two distinct phases. Up to week 12 the emphasis was on faily self monitoring of intake. Following this the emphasis shifted to increased frequency of weighing. Increased exercise needed to be considered on an ideographic basis.

The ideal weight loss was considered to one pound a week.

The data generated in the programme was considered in two ways:

A Each S's progress was considered ideographically. The individual weight graphs showing the weekly (or daily) weight changes against the particular schedules and influences of each S, were of particular assistance in this approach.

B The results of all the Ss together, were considered nomothetically. A number of scores were calculated and considered.

(a) Weight changes were calculated relative to each S's initial and final 97th percentiles.

(b) California Test of Personality Scores:
(i) The initial scores were considered as an indication of the extent to which the group was showing personal and social maladjustment. Scores at or below the 10th percentile were taken to be an indication of some disturbance.

(ii) The initial scores were then converted to standard scores which in turn were compared to the weight loss scores.

The Pearson Product Moment Correlation Index, r, was found between the total Adjustment scores and weight loss. The significance of the correlation was found using the formula

$$t = \frac{r\sqrt{n-2}}{\sqrt{1-r^2}}$$

and a table showing the distribution of t. (Smith, 1970, pp.80 and 157).

In the same way the correlations between weight loss and the subscores Family Relations and Personal Worth were also found and tested for significance.

It was assumed that if California Test of Personality Scores had value as success predictors, then a significant positive correlation would be found.

(iii) The final California Scores were examined to consider the extent to which the group was still showing maladjustment.

(iv) The final percentile scores were converted to standard scores and compared to the initial standard scores to find the gains in standard scores.

(v) The gains in the Personal Adjustment standard scores were compared to the Ss' weight losses. The Pearson Product Moment Correlation Coefficient was found and tested as before.

It was assumed that if weight loss led to improved personal adjustment, then a significant positive correlation would be found.

(c) Bristol Social Adjustment Guide Scores:

The initial and final scores were examined to discern the extent of social maladjustment evident to Ss' teachers. The final scores were then visually compared to the initial scores to see if any trends were apparent.

It was hypothesised that being obese, the group would exhibit considerable social maladjustment but that following weight loss a trend towards less maladjustment would be apparent.

(d) Sociogram:

The scores were examined visually to determine the extent of unpopularity among the obese group, and to determine any trends evident between the beginning and end of the programme.

It was hypothesised that the group would experience considerable unpopularity and that this could lessen following weight loss.

(e) Family Eating Patterns Questionnaire:
Ss' scores on the Questionnaire (See Appendix I) were compared with their weight loss. The Pearson Product Moment Correlation Index, r, was calculated and tested for significance.

(f) Measures of School Success Prior to Entry into Secondary School:
Ss' Otis scores and Personal Effort scores were both compared with their weight loss. The Pearson Product Moment Correlation Index, r, was calculated for both and tested for significance.

It was assumed that if these scores were useful as success predictors significant positive correlations would be found.

(g) School Registers:
(i) Each term's half days absent score was calculated for each pupil in every class which included any of the 11 Ss who had begun the programme. The mean of the 11 Ss' scores was compared with the mean of the 678 other pupils' scores. Using the Fisher formula and the method suggested by Smith (1970, p.83) the significance of the difference between the means was calculated.

It was assumed that if obese children were absent more frequently than non obese children, the difference between the means would be significant.

(ii) Termination of Schooling:
All 3rd, 4th, and 5th formers were divided into two groups, the "obese group" which included all those invited to participate in the programme, and all the others.

The numbers of school terminaters in the period under investigation was noted for each group.

The proportion of school terminaters in the obese group was compared with the proportion of school terminators in the "other" group.

The hypothesis was tested that the two proportions were independent of each other. This was done by calculating $X^2$ and testing its significance using Fisher's Table. (See Smith, 1970, p.192).

It was assumed that if obese students suffered high risks of terminating school prematurely, then the difference in terminating rates would prove significant.

(h) Academic Performance as Measured by School Reports: Each S's school reports were examined. On each report the various grades were converted to numbers on the basis of A (Excellent) = 5 and E = 1. These numbers were then added to give a total number for the report. This process was carried out on both the first and third term reports.

The gain (or loss) from the first term report number to the third term report number was taken as a measure of the students' improved (or deteriorated) academic performance.

In this way an academic improvement score was calculated for **every** third and fourth former who had been invited to join the programme.

The academic improvement scores of the six third and fourth formers who participated in the programme were compared to the Ss' weight loss. The Pearson Product Moment Correlation Coefficient was calculated and its significance tested.

It was assumed that if success in losing weight generalised to academic progress, a significant positive correlation would be found.

The academic improvement scores of the Ss who participated were then compared to the academic improvement scores of the obese students who declined to participate. The difference in the means of the two groups was tested for significance using the Fisher formula and a distribution table. (Smith, 1970, p.83).

(For an overview of each S in relation to the others in the study. See Table 1).

Under the ideographic approach, each S was considered in relation to the particular schedules and factors applying to him. The S's individual graphs facilitated this analysis.

Case 1, R, see Figure 2:

R's weight loss took place in the initial period. In weeks 1-6 under the diet-intake recording schedules, his weight loss was moderate. (.7 lb/week). Over the holiday period (weeks 7-10) without any contact for weighing his weight rose rapidly. (1.1 lb/week).

From week 10 he started an exercise programme with his father and initially it coincided with a short period of rapid loss. But by week 12 the exercise programme became less intensive. His eating pattern had resumed its previous preprogramme pattern and his weight rose quite rapidly, (.6 lb/week), but was comparable to the rise of his 97th percentile due to his growth.

Case 2, A, see Figure 3:

Despite E's encouragement, A completed only four intake records in weeks 1-11. They were never completed on the same day, or at home. During these weeks his weight rose steadily and rapidly. (.8 lb/week).

From week 11 he undertook an exercise programme (bike riding during lunch hours). Under the increased frequency of weighing schedules (weeks 12-19) his weight change was zero - a considerable improvement. In view of his growth rate this represented a loss of .5 lb/week. Also about this time, A's parents had entered into a reinforcement contract with him whereby if he "lost weight" they would buy him a boat. This seemed to be important to A. It seemed possible that all three factors, increased exercise, increased frequency of weighings and the reinforcement contract could have been involved in A's zero weight change.

TABLE 1

Ss IN OBESITY REDUCTION PROGRAMME

| NAME | (at start) AGE (yrs) mos) | FORM | INITIAL | | | | FINAL | | | | IMPROVEMENT | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | HEIGHT (cm) | WEIGHT (lbs) | OVER 97th | POND INDEX | HEIGHT (cm) | WEIGHT (lbs) | OVER 97th | POND INDEX | WEIGHT DIFF (lbs) | LOSS re 97th | POND INDEX GAIN |
| BOYS | | | | | | | | | | | | | |
| R | 13-11 | 3rd | 151 | 134 | 17¾ | 11.62 | 155 | 136½ | 8½ | 11.84 | 2½ gain | 9¼ | .22 |
| A | 13-8 | 3rd | 148.5 | 152½ | 42¼ | 10.94 | 152.5 | 160¼ | 43¼ | 11.05 | 7¾ gain | 1 gain | .11 |
| D | 14-9 | 4th | 177 | 218 | 37¾ | 11.57 | 178.5 | 221¼ | 38¼ | 11.62 | 3¼ gain | ½ gain | .05 |
| S | 14-2 | 4th | 160 | 161 | 17¾ | 11.58 | 162 | 163¼ | 10¾ | 11.67 | 2¼ gain | 7 | .09 |
| K | 14-9 | 4th | 163 | 159½ | 5½ | 11.83 | 166 | 148½ | 14½ under | 12.34 | 11 loss | 20 | .51 |
| M | 15-5 | 5th | 170 | 182 | 11½ | 11.81 | 171.5 | 183½ | 9¾ | 11.88 | 1½ gain | 1¾ | .07 |
| L | 15-6 | 5th | 176 | 180½ | ¾ | 12.26 | 176.5 | 175 | 5½ under | 12.42 | 5½ loss | 6¼ | .16 |
| GIRLS | | | | | | | | | | | | | |
| C | 14-2 | 4th | 159 | 207 | 52 | 10.58 | 160 | 199¾ | 42¼ | 10.77 | 7¼ loss | 9¾ | .19 |
| G | 16-3 | 5th | 156 | 144½ | 2¾ under | 11.70 | 156.5 | 144¾ | 4¼ under | 11.73 | ¼ gain | 1½ | .03 |
| MEANS | | | | | | | | | | | | | |
| | | | | | | 11.54 | | | | 11.70 | 0.7 loss | 6.0 | .16 |

The weight rise (.4 lb/week) during the final baseline period when no weighings were made, was suggestive that the frequent weighings of weeks 13-19 were important.

A was the one S in the group whose California scores deteriorated. (See Tables 2 and 3). The worsening of his Personal Worth subscore was particularly noticeable (from the 20th to the 1st percentile). All the other prepost test measures, Bristol, Sociogram and School Report showed deterioration also.

Though A's weight gain in relation to his 97th percentile was small (1 lb) his actual weight gain was considerable ($7\frac{3}{4}$ lb). This was much worse than any other S. In addition there was no period where A was consistently able to lose weight.

Though A did not complete a Family Eating Pattern Questionnaire, in view of the very low Family Relations California subscore (1st percentile for both testings) it would seem that further meetings with A's parents with a view to creating more constructive family support would have been helpful.

Case 3, D, see Figure 4:

Under the intake recording schedules (weeks 2-9) D's weight loss was modest. (.5 lb/week).

While on an overseas holiday with one of his parents (weeks 9-13) D's loss was considerable. (1.2 lb/week).

On returning home (weeks 13-20) his weight gain was rapid (1.8 lb/week). There was a lessening of the gain in weeks 18-20 which coincided with D beginning an exercise programme.

During a class camp (weeks 20-22) which was of an outdoor high exercise type, D's loss was again considerable. (1.1 lb/week).

For D it seemed that while the initial recording schedules were of value, major weight loss occurred only:

(a) at times of greatly increased exercise; and

(b) when away from home with its rich food stimuli. (D reported that at home there were always ...

"tantalising (food) smells saying 'Come and get!').

The programme may have been more effective had it concentrated more on increasing constructive family support.

His final California scores showed he had made major gains especially in the Self Reliance (from 5 to 40), Personal Worth (from 2 to 50), and Family Relations (from 30 to 80) subscores. (See Tables 2 and 3).

Case 4, S, see Figure 5:

During weeks 1-6 (Intake Recording Schedules) S was taking prolonged vigorous exercise (on a milkrun) and his weight dropped markedly. (1.0 lb/week).

Over the holiday period for four weeks without being weighed and without the vigorous activity, (he had given up the milkrun) his weight rose rapidly. (2.1 lb/week). His weight gain was considerably higher than any of the other Ss suggesting the importance of the lack of activity.

Following the holidays he began an exercise programme (jogging) and under the frequent weighing schedules his weight dropped modestly. (.4 lb/week).

In the final baseline period without contact for two and a half weeks his weight again rose sharply (1.0 lb/week) perhaps implying the importance of the frequent weighings.

Case 5, K, see Figure 6:

K undertook an exercise programme from the start. It was suspended during weeks 6-11, resumed again and finally ended at week 18. But even then his exercise level seemed considerably higher than prior to the beginning of the obesity reduction programme.

Under intake recording schedules (weeks 1-6) K lost weight rapidly. (1.6 lb/week). His intake recording continued over the holiday period (weeks 6-10), but there was no weighing contact. His weight rose marginally. (.1 lb/week).

During the period weeks 10-22, he lost considerable weight in the weeks 11-18. (.7 lb/week). This rapid weight loss period coincided with his resumed exercise programme. In the weeks outside this exercise period he gained weight slightly. But in relation to his percentile increase he was still achieving considerable reduction.

It appeared that the increased exercise was a most important factor in his successful weight loss.

There were major improvements in his California scores (60th to 95th percentile), his Bristol scores ("appreciable under-reaction" to "stability") and in his academic performance measured by his school reports. (See Tables 2,3,5).

From the structured interview it appeared that he was now able to control his food environment and was feeling much fitter.

Case 6, M, see Figure 7:

While there was little overall change in his obesity at the end of the programme, M did achieve modest weight losses (.3 lb/week) under the intake recording schedule. But these were nullified by the rapid gains (1.1 lb/week) under the increased frequency weighing schedules.

The sharp peak in week 12 was associated with a weekend religious festival followed by a week's sickness.

Weight gain seemed to be associated with periods of increased anxiety. This seemed evident during the 5th form exam period (weeks 5-6), the resumption of school (week 10) and prior to School Certificate (weeks 15-18).

It is possible the lowered anxiety level following school certificate and with the end of the school year, was a factor in the near zero weight change in weeks 18-21 (despite no weighing contacts), following the rapid gain immediately before.

Case 7, L, see Figure 8:

Until week 13, L's approach to the programme was haphazard. He rarely kept appointments. During the intake recording schedules he returned records for only four days.

The weight loss over the holiday period (weeks 6-10) were the result of a "holiday starve" but the loss was just as rapidly replaced (by week 14).

In week 14 he entered into a contingency contract with his parents by which he had to adhere to the programme for the following three weeks. His weighing contacts became regular and initially he achieved some loss.

In week 16 he amended the contract so that it would cost him $15.00 if he failed to achieve a 15 lb loss within three weeks.

His weight dropped rapidly (9¼ lb for weeks 16-18). In the final baseline period (weeks 18-21) his weight dropped a further 2½ lb.

L reported that he was successful in gaining his contract in which case his weight must have risen by some 3 lb prior to his final weighing (week 21).

L's California scores showed a dramatic improvement especially in the Personal Adjustment Section. (See Tables 2 and 3). His final Bristol scores suggested that the improvement in his personal adjustment was becoming translated into observable behaviour. (See Table 5). His overreact score showed real improvement.

From L's comments it appeared that his whole eating pattern had improved radically and there were signs that one parent, at least, was being more supportive.

It is possible that in view of his low scores in the Family Support Questionnaire, that therapy aimed at increasing constructive family support would have led to earlier weight loss.

Case 8, C, see Figure 9:

C was the most seriously obese S in the programme group. Prior to E approaching her, she had already contacted her own doctor about weight loss and seemed strongly motivated.

The weight rise during weeks 4 and 5 coincided with a Children's Court appearance which caused her considerable anxiety.

Over the holiday period (weeks 7-9) her exercise rate increased markedly and her weight loss was more marked until her return to school. The peak in week 13 coincided with a further police contact.

From the end of the school holidays (week 10) there was considerable difficulty in weighing C because of her increasing truancy.

Possibly the extended period with no weighings (weeks 17-22) were suggestive that C would have difficulty continuing to lose weight without frequent weighings.

Case 9, G, see Figure 10:

G was the only S who was initially below the 97th percentile.

The programme appeared to have made no percentible difference to G's weight. At the conclusion no change was discerned in G's or the family's food consumption pattern. But G felt she was exercising more.

The swings in her weight initially (weeks 1-6) were apparently associated with medication prescribed by her doctor for a non related problem. He had remarked that weight changes were likely to occur.

Her low scoring in the Family Support Questionnaire suggested that the programme may have been successful had more emphasis been placed on eliciting family support.

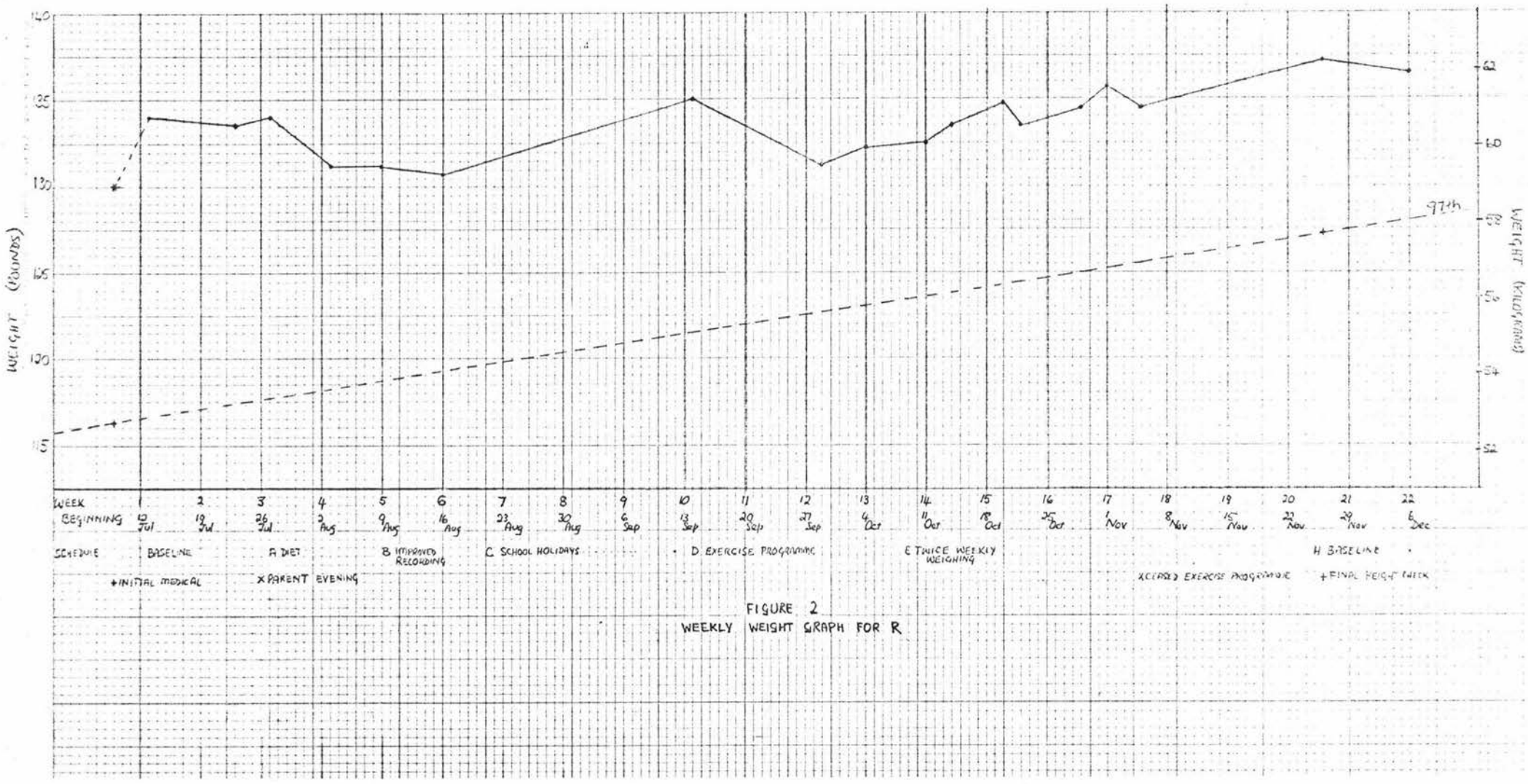


FIGURE 2
WEEKLY WEIGHT GRAPH FOR R

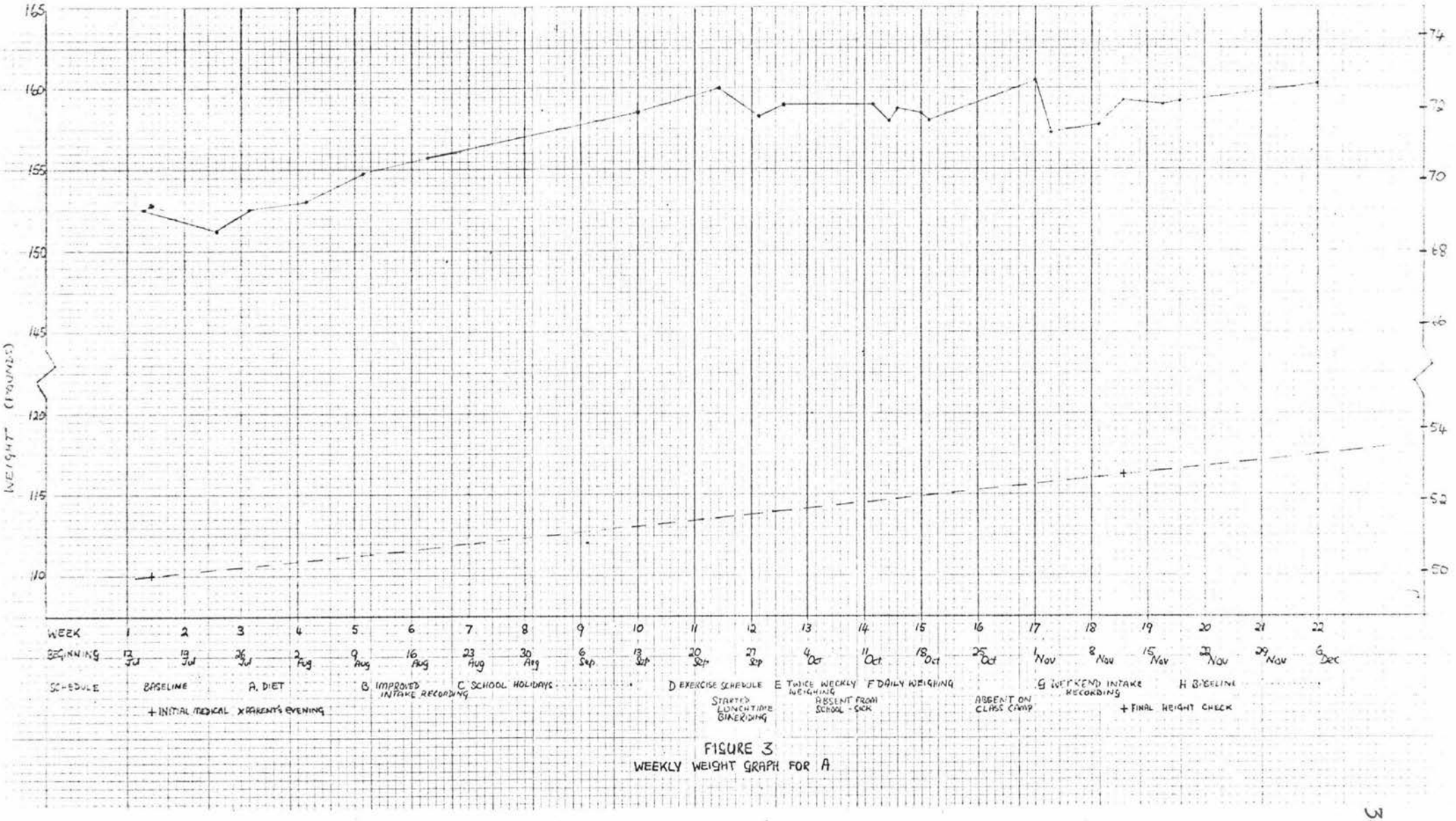


FIGURE 3
WEEKLY WEIGHT GRAPH FOR A

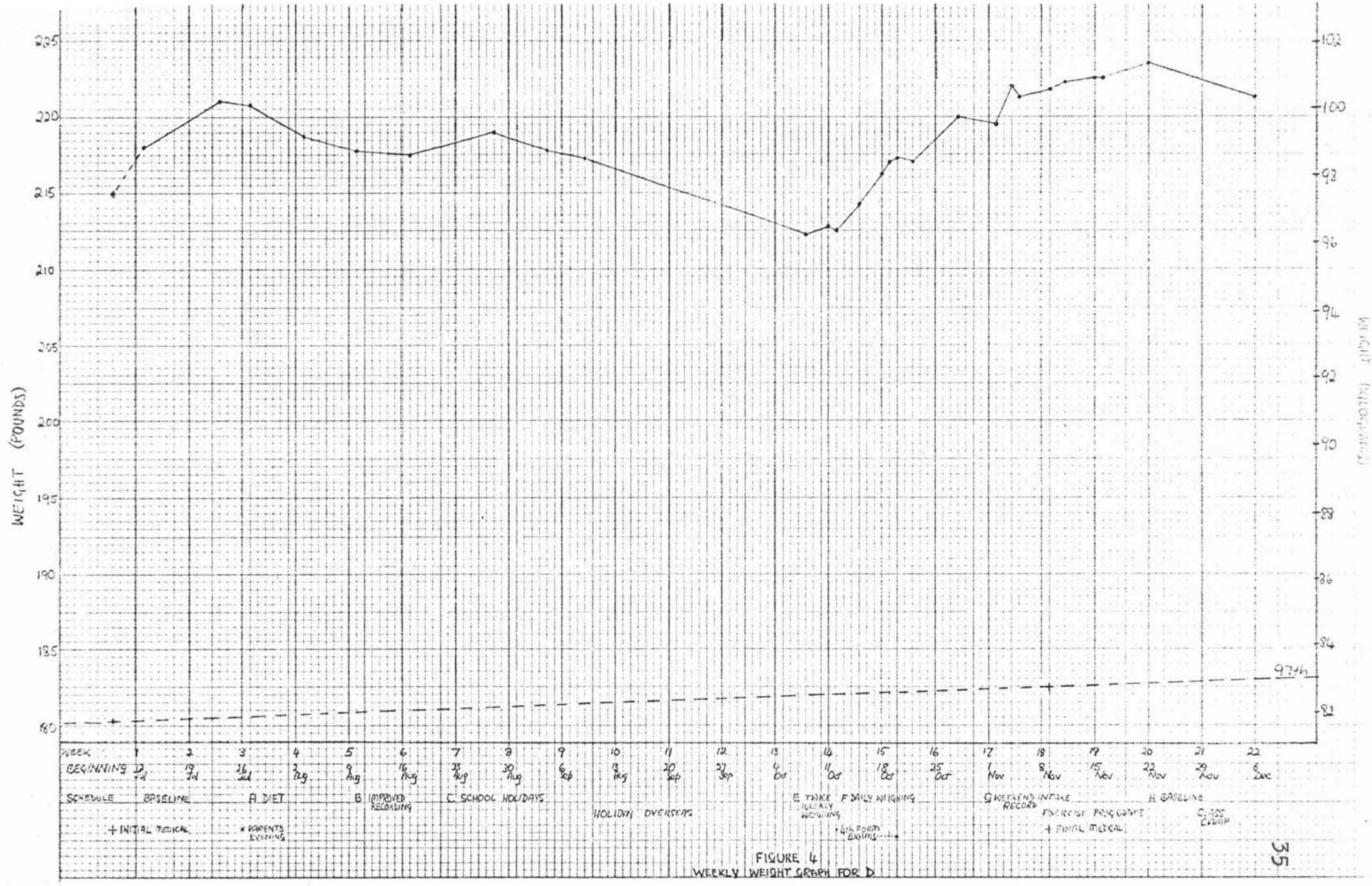


FIGURE 4
WEEKLY WEIGHT GRAPH FOR D

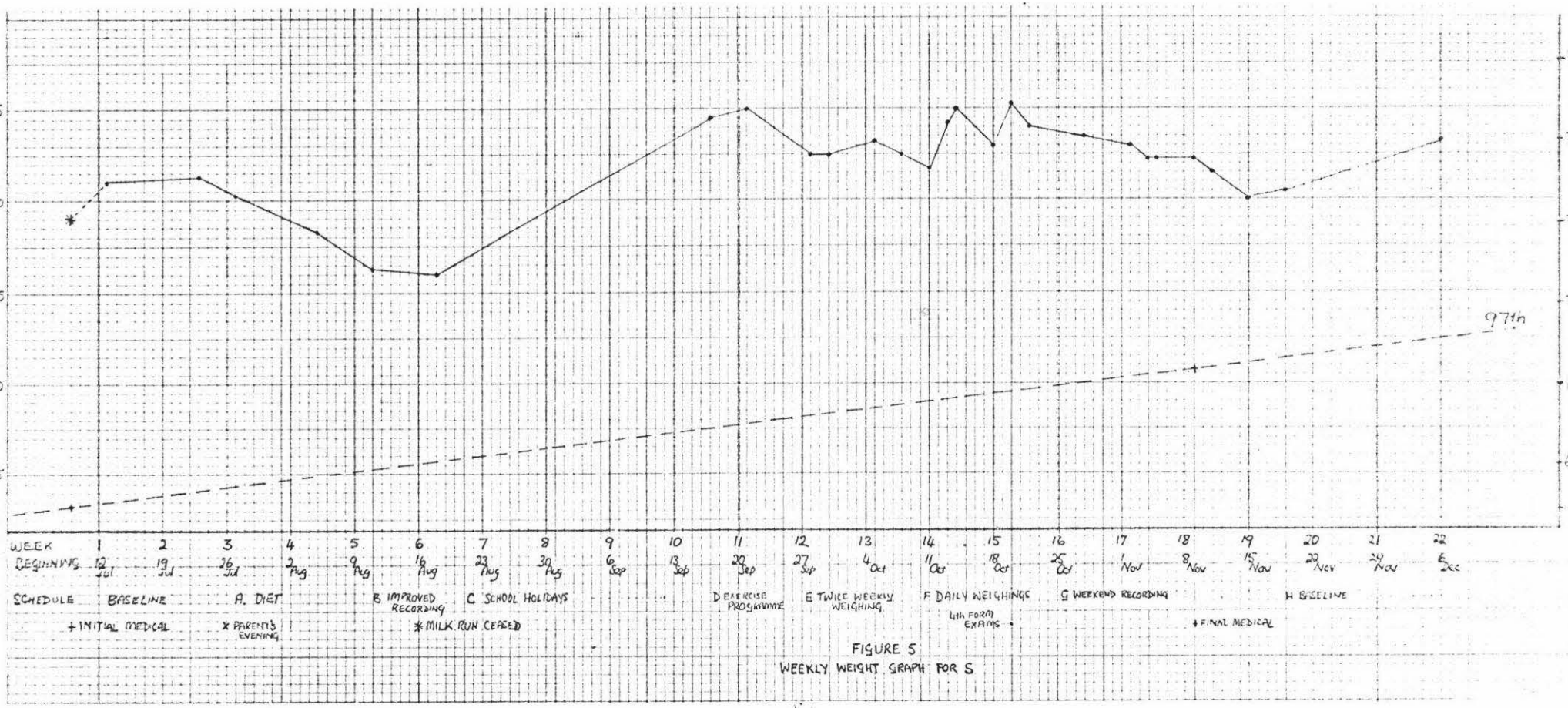


FIGURE 5
WEEKLY WEIGHT GRAPH FOR S

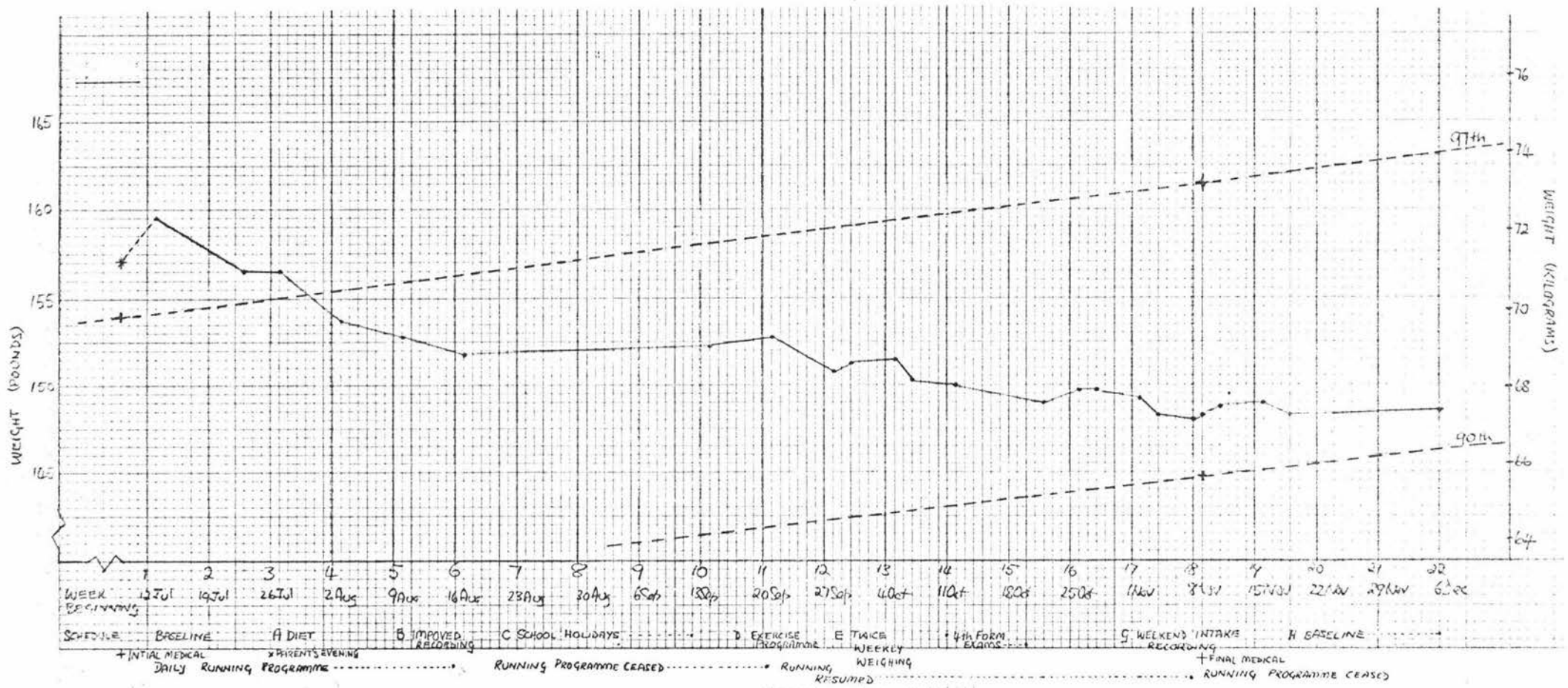


FIGURE 6
WEEKLY WEIGHT GRAPH FOR K

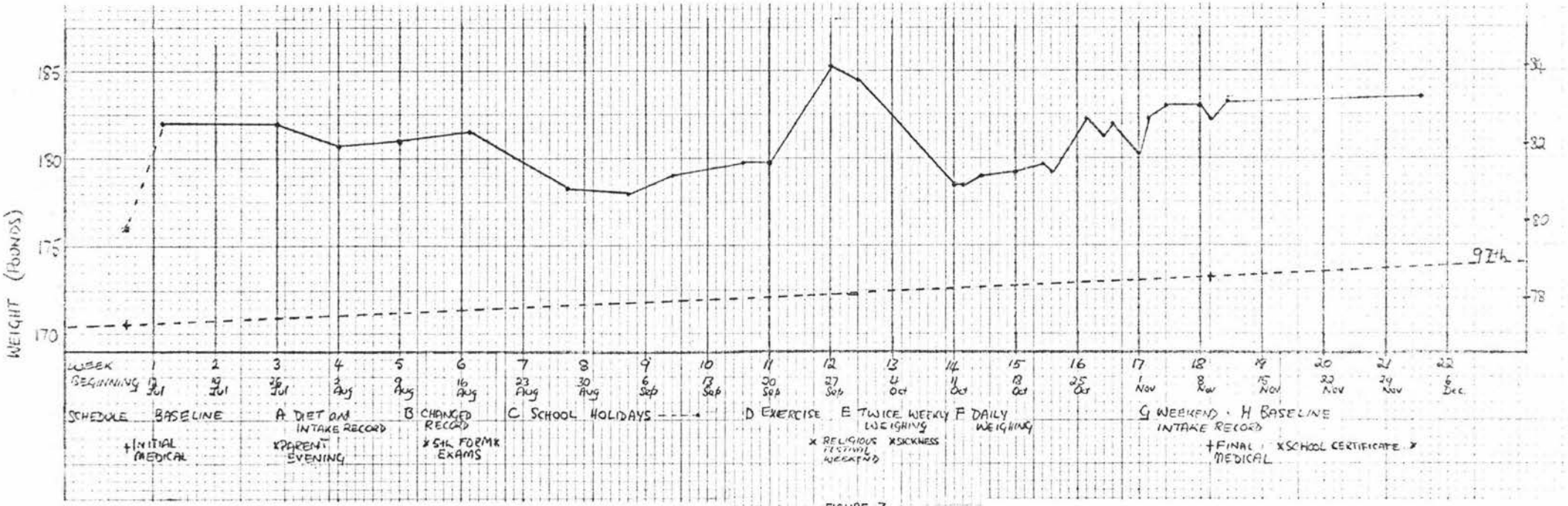


FIGURE 7
WEEKLY WEIGHT GRAPH FOR M

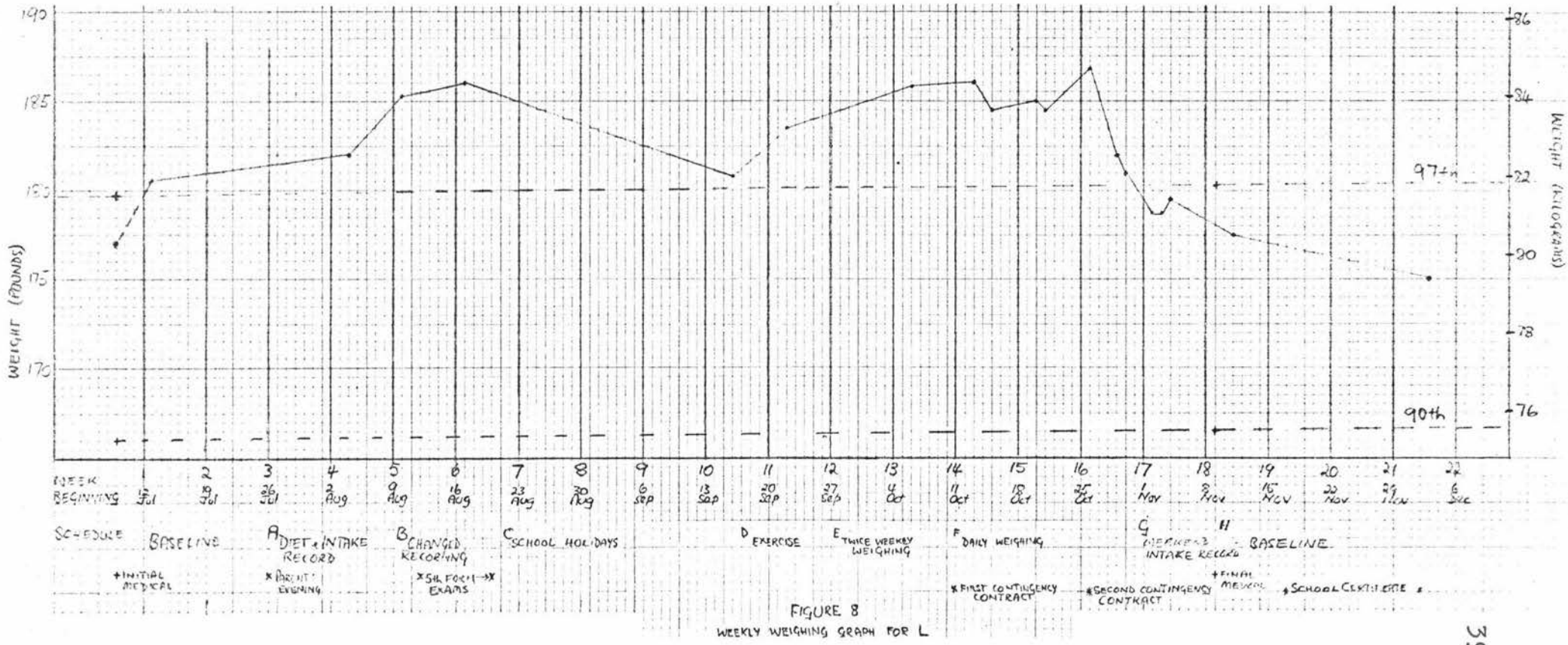


FIGURE 8
WEEKLY WEIGHING GRAPH FOR L


FIGURE 9
WEEKLY WEIGHING GRAPH FOR C.

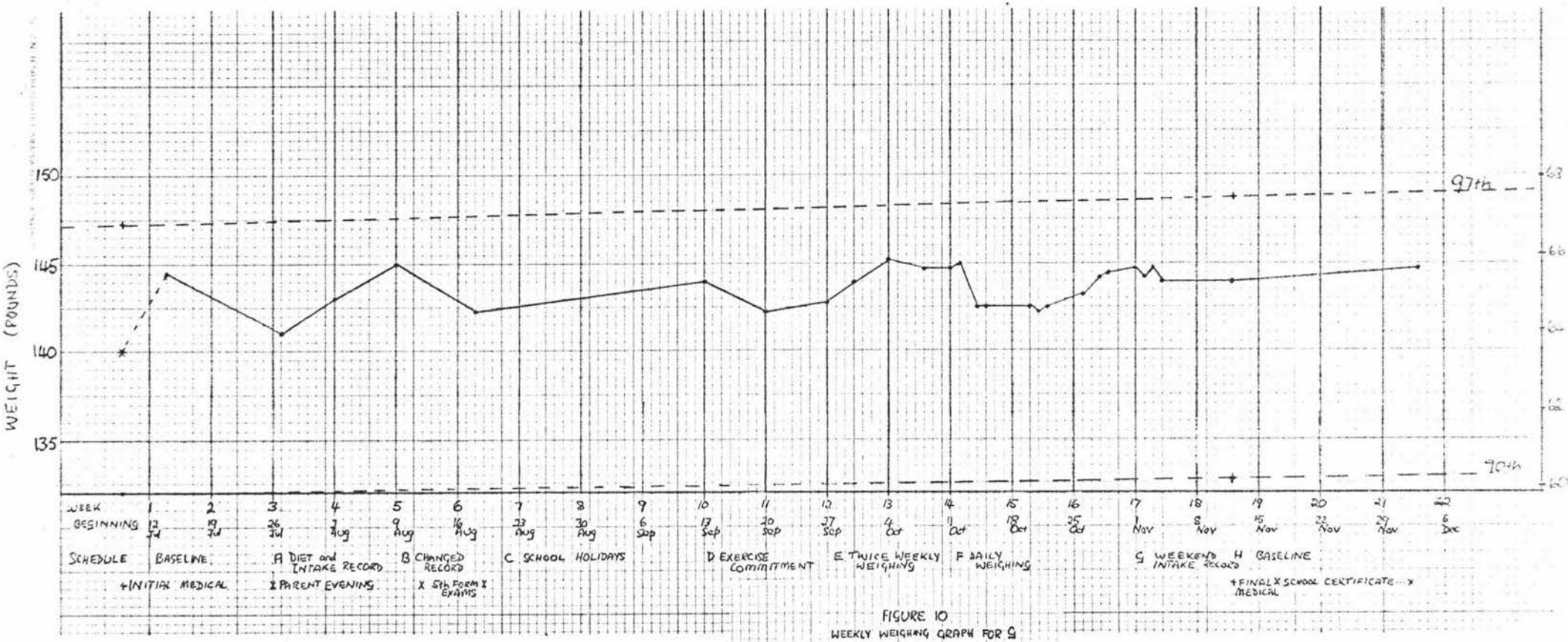


FIGURE 10
WEEKLY WEIGHING GRAPH FOR S

# RESULTS

## CALIFORNIA TEST OF PERSONALITY

The initial scores for the California Test of Personality were particularly low. (Table 2). Only one S's scores (K's) suggested normal adjustment. Three Ss had total adjustment scores at the 5th percentile rank while one scored at the 2nd percentile rank. For the Personal Adjustment total three Ss scored at the 2nd percentile and one at the 1st percentile. Taken overall the initial test scores showed that the group was exhibiting considerable maladjustment both personal and social.

The posttest scores showed major improvement. The median percentiles for Personal Adjustment, Social Adjustment and Total Adjustment (20, 30 and 20) were still below the norm percentile (50). But only one S scored below the 10th percentile for Personal Adjustment (A, who scored at the 1st percentile). Only two scored below the 10th percentile for total adjustment.

The improvement was particularly evident in the Personal Adjustment section. Self Reliance, Sense of Personal Worth, Feeling of Belonging and Withdrawing Tendencies subscores all showed large gains in their mean standard scores. The only subscore of the Social Adjustment Section to show major gain was Social Skills.

In comparing the increase in California Personal Adjustment Standard Scores with weight loss, D's loss was taken as that in weeks 1-13, L's loss was taken as that in weeks 14-22, and M's loss was taken as that in weeks 1-14. These were the periods of their weight loss. It was argued that if improvement in self image follows a period of successful weight loss then L's period of weight gain prior to his weight loss could be discounted. Similarly it was argued that the hypothesised improvement in D's and M's self images would not be nullified immediately by their subsequent weight gains. It seemed that C's California scores could have been unduly depressed by her police ...

involvement and Court appearances so she was excluded from the comparison. The weight loss for the full period weeks 1-22 was taken as the variable for the other S's.

A correlation r = .77 was obtained. This was significant at the .05 level.

In comparing the initial California Total Adjustment Standard scores with weight loss throughout the programme (weeks 1-22) a correlation =.74 was obtained. This was significant at the .02 level.

The subscores, Family Relations and Personal Worth from the initial test, were also found to correlate highly with subsequent weight loss (.66 and .80 respectively). These were significant at the .05 and .01 levels respectively.

BRISTOL SOCIAL ADJUSTMENT GUIDES

When considering the totals of either under-reaction or over-reaction there were only two Ss who were not exhibiting maladjustment, in at least one of the initial or final assessments. Maladjustment was particularly marked in the under-reaction section where six Ss were showing maladjusted under-reaction. (See Table 5). A further two were exhibiting "Appreciable Under-reaction." Eight of the 10 Ss were scoring at the 10th percentile or worse.

Of the five core syndromes disturbances were evident in the three under-reaction syndromes and to a lesser extent in the Hostility syndrome. The Depression syndrome particularly showed that five Ss were at one stage at least, showing moderate or severe symptoms, scoring at the 6th percentile or less. The Depression score measures "a lack of response to the stimuli to which children normally respond without apprehensiveness or social withdrawal." (Stott, 1971, p.11).

In comparing the initial with the final assessments, no trends were apparent. The group was exhibiting as much disturbance in its final assessment as at the start of the programme. K's was the only score to show ...

significant change moving from an "appreciable under-reaction" to "stability". He too was the one S who lost substantial weight (20 lb). But the group's results overall do not suggest improvement proportional to weight loss.

SOCIOGRAM

Unfortunately the initial "dislike rating" was not calculated for four Ss. This meant that although all Ss had at least one "dislike rating" it was not possible as hoped to test for trends between the initial and final assessments. The classes tested also included one pupil who was approached to take part in the programme and who declined (Mi). His results are also included.

Of the 10 Ss, seven had dislike ratings at the 24th percentile or worse, (i.e. they were among the most disliked members of their classes). Three of these were among the two most disliked class members. Only two Ss scored above the 50th percentile. (See Table 6).

No trend was observable from the initial to the final scorings.

MEASURES OF SCHOOL SUCCESS PRIOR TO ENTRY INTO SECONDARY SCHOOL (See Appendix J)

The Otis scores were found to have a relatively low correlation with weight loss (.59).

The Personal Effort Score found on the pre-entry cards, correlated highly with weight loss (r= .84, significant at the .02 level).

SCHOOL REGISTERS

The records of the 11 who began the programme indicated that each was absent a mean 21.2 half days a term (SD = 17.2). The balance of the children (678) in their classes were absent - mean 8.9 half days a term (SD = 7.05). Using the Fisher Formula (Smith, 1970, p.83) the differences between the means was highly significant (p= .001).

Truancy was noted frequently for two Ss. The School Counsellor had been involved with both lots of parents on account of their truancy. For one of them, (C), there was a risk of suspension because of it. Teachers reported their suspicions of truancy with two other Ss. No record of the truancy rate in the Junior School was obtainable.

TERMINATION OF SCHOOLING

Only those 3rd, 4th and 5th form pupils were counted who left school in the period from when the Ss were approached initially, up to the completion of the programme. Pupils who qaited to leave till they had completed the school year, were not included. Likewise, pupils whom the records showed had moved to another school, were excluded.

Of the 23 obese students initially approached about the programme, three terminated. Of the 969 other pupils, 37 terminated. The difference in termination rate was significant at the .02 level.

ACADEMIC PERFORMANCE AS MEASURED BY SCHOOL REPORTS (See Appendix K)

The six Ss showed a small improvement overall mean = (1.83 standard deviation 8.0). Comparing the improvements with weight loss gave a modest correlation =.48. This was not significant.

Of the five obese Juniors who had refused the programme, one (I) was no longer obese by the end of the year so his results were excluded. The remaining group showed a marked deterioration in their academic performance:

Mean = 9.2 deterioration SD = 4.1

Comparing the two groups the difference was significant at the p= .05 level.

HOLIDAY SUBGROUPS

The three Ss of the weekly group continued to lose weight at approximately the same rate as in weeks 1-6. (Mean .19 lb/week compared with .17 lb/week prior to the holiday period). But the six Ss in the monthly group gained at mean rate .52 lb/week whereas these six had lost .33 lb/week prior to the holiday when they were on weekly weighings.

TABLE 2

CALIFORNIA TEST OF PERSONALITY

INITIAL SCORES

| Name | PERSONAL ADJUSTMENT SUBSCORE PERCENTILE RANKS | | | | | | | SOCIAL ADJUSTMENT SUBSCORE PERCENTILE RANKS | | | | | | Social Adjustment | Total Adjustment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Self Reliance | Sense of Personal Worth | Sense of Personal Freedom | Feeling of Belonging. | Withdrawal tend. | Nervous Symptoms | Personal Adjustment | Social Standards | Social Skills | Anti Social tend. | Family Relns | School Relns | Commty Relns | | |
| S | 30 | 5 | 90 | 20 | 30 | 60 | 30 | 5 | 50 | 20 | 60 | 50 | 50 | 30 | 30 |
| D | 5 | 2 | 40 | 5 | 5 | 40 | 10 | 20 | 10 | 20 | 30 | 40 | 50 | 20 | 10 |
| L | 10 | 2 | 10 | 5 | 1 | 2 | 1 | 40 | 10 | 1 | 40 | 30 | 5 | 10 | 5 |
| M | 40 | 1 | 1 | 1 | 1 | 70 | 2 | 20 | 10 | 10 | 20 | 5 | 20 | 10 | 5 |
| K | 70 | 30 | 50 | 70 | 40 | 90 | 60 | 60 | 20 | 95 | 90 | 90 | 40 | 60 | 60 |
| A | 10 | 20 | 1 | 10 | 5 | 1 | 2 | 40 | 5 | 20 | 1 | 1 | 5 | 2 | 2 |
| R | 20 | 20 | 10 | 5 | 1 | 20 | 2 | 40 | 2 | 1 | 20 | 5 | 5 | 2 | 5 |
| C | 10 | 50 | 20 | 20 | 2 | 60 | 20 | 5 | 50 | 2 | 10 | 10 | 20 | 10 | 10 |
| G | 20 | 2 | 40 | 5 | 5 | 30 | 10 | 80 | 10 | 20 | 10 | 5 | 30 | 10 | 10 |

TABLE 3

CALIFORNIA TEST OF PERSONALITY

FINAL SCORES

| Name | PERSONAL ADJUSTMENT SUBSCORE PERCENTILE RANKS | | | | | | | SOCIAL ADJUSTMENT SUBSCORE PERCENTILE RANKS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Self Reliance | Sense of Personal Worth | Sense of Personal Freedom | Feeling of Belonging | Withdrawal tend. | Nervous Symptoms | Personal Adjustment | Social Standards | Social Skills | Anti Social Tend. | Family Relns | School Relns | Commty Relns | Social Adjustment | Total Adjustment |
| S | 70 | 50 | 50 | 20 | 80 | 70 | 50 | 5 | 90 | 2 | 80 | 20 | 40 | 20 | 40 |
| D | 40 | 50 | 40 | 30 | 20 | 50 | 30 | 60 | 30 | 10 | 80 | 30 | 40 | 30 | 30 |
| L | 90 | 80 | 70 | 90 | 60 | 20 | 70 | 40 | 70 | 40 | 60 | 40 | 5 | 30 | 50 |
| M | 70 | 5 | 5 | 5 | 20 | 60 | 20 | 80 | 20 | 10 | 80 | 5 | 50 | 30 | 20 |
| K | 95 | 80 | 70 | 90 | 80 | 98 | 98 | 80 | 90 | 95 | 90 | 90 | 50 | 95 | 95 |
| A | 20 | 1 | 1 | 10 | 1 | 2 | 1 | 10 | 2 | 2 | 1 | 1 | 5 | 1 | 1 |
| R | 10 | 20 | 30 | 50 | 1 | 20 | 10 | 5 | 2 | 1 | 30 | 1 | 20 | 2 | 5 |
| C | 5 | 50 | 40 | 10 | 5 | 50 | 20 | 1 | 30 | 2 | 30 | 5 | 40 | 5 | 10 |
| G | 50 | 2 | 10 | 5 | 5 | 20 | 10 | 60 | 90 | 80 | 10 | 5 | 40 | 30 | 20 |

TABLE 4

CALIFORNIA TEST OF PERSONALITY

MEAN IMPROVEMENT OF STANDARD SCORES

| | PERSONAL ADJUSTMENT SUBSCORE | | | | | | | SOCIAL ADJUSTMENT SUBSCORE | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Self Reliance | Sense of Personal Worth | Sense of Personal Freedom | Feeling of Belonging | Withdrawal tend. | Nervous Symptoms | Personal Adjustment | Social Standards | Social Skills | Anti Social tend | Family Relns | School Relns | Commty Relns | Social Adjustment | Total Adjustment |
| Mean improvement | 8.2 | 7.7 | 4.3 | 7.1 | 7.4 | 2.4 | 8.2 | -0.3 | 9.2 | 1.2 | 5.7 | -2.0 | 2.3 | 3.2 | 5.8 |

TABLE 5

BRISTOL SOCIAL ADJUSTMENT GUIDES NO.2
THE CHILD IN THE SCHOOL
INITIAL AND FINAL SCORES

| UNDER-REACTION | | | | | | | | | | OVER-REACTION | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Unforth-coming-ss | | With-drawal | | Depress-ion | | Non-Syndromic | | Total Under-Reaction | | Neuro-logical | | Incon-sequence | | Hostility | | Peer Mal-Adaptive-ness | | Non Syndromic | | Total Over-Reaction | |
| F | I | F | I | F | I | F | I | F | I | F | I | F | I | F | I | F | I | F | I | F |
| 1 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 4 | 1 | 1 | 9 c | 10 c | 3 | 6 c | 3 | 2 | 2 | 4 | 17 b | 22 b |
| 3 | 0 | 1 | 1 | 1 | 5 | 0 | 9 b | 5 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2 | 3 c | 6 d | 3 c | 0 | 2 | 1 | 8 a | 9 b | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 6 | 0 |
| 5 c | 2 c | 1 | 3 c | 1 | 1 | 2 | 9 b | 9 b | 0 | 0 | 3 | 1 | 4 c | 3 | 2 | 0 | 1 | 0 | 10 a | 4 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 6 a | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 1 | 1 | 4 c | 2 | 1 | 3 | 7 a | 0 | 0 | 2 | 4 | 1 | 1 | 0 | 1 | 1 | 1 | 4 | 7 |
| 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 7 c | | 2 | | 0 | | 4 | | 13 b |
| 1 | 0 | 2 c | 1 | 5 d | 3 | 1 | 13 b | 9 b | 0 | 0 | 0 | 2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 5 |
| 8 d | 0 | 0 | 0 | 0 | 1 | 2 | 6 a | 10 b | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2 | 0 | 1 | 5 d | 4 c | 1 | 2 | 6 a | 9 b | 0 | 0 | 4 | 1 | 5 c | 2 | 3 | 1 | 2 | 2 | 14 b | 6 |

rees of severity for the main scales, Total Under-Reaction and Total Over-Reaction are marked:
ppreciable; b= Maladjusted; Degrees of severity for the 5 core syndromes: Unforthcomingness, Withdrawal,
ression, Hostility and Inconsequence are marked: c= Moderate; d= Severe.

TABLE 6

RESULTS OF SOCIOGRAM

| Name | No. in Class | INITIAL | | | FINAL | | |
|---|---|---|---|---|---|---|---|
| | | Like | Dislike | Dislike Percentiles a | Like | Dislike | Dislike Percentiles |
| S | 34 | 6 | 2 | | 4 | 2 | 59 |
| D | 34 | 2 | 0 | | 5 | 0 | 91 |
| L | 32 | 3 | 7 | 22 | | | |
| M | 34 | 0 | 23 | 3 | | | |
| K | 35 | 2 | 0 | | 1 | 1 | 40 |
| A | 30 | 2 | 2 | | 2 | 5 | 17 |
| R | 29 | 2 | 7 | 14 | 0 | 4 | 24 |
| C | 26 | 1 | 2 | 31 | 1 | 0 | 42 |
| St | 29 | 0 | 22 | 3 | 0 | 20 | 3 |
| Mi | | | | | 0 | 9 | 6 |

NOTE: A low Dislike Rating indicates unpopularity.

a = No initial Dislike Rating was able to be calculated for S, D, K or A.

## SOCIAL AND PERSONAL ADJUSTMENT

Many studies have pointed to the social and personal maladjustment regularly exhibited by obese children.

The results of this present study have lent strong support to these indications. The initial California Test of Personality scores suggested that the group was showing considerable personal and social maladjustment. Seven of the nine Ss had total scores at the 10th percentile or worse, which in New Zealand is regarded as a clear indication of emotional disturbance. The scoring in the Bristol Social Adjustment Guide pointed to a similar trend. Only two of the nine Ss had scores not indicating either maladjustment under-reaction or over-reaction.

Several studies have noted that a depressive reaction was common among obese adolescents. The Bristol scores would lend some support to this. Five Ss were exhibiting moderate or severe Depression symptoms. Six Ss were exhibiting maladjusted under-reaction while a further two were showing appreciable under-reaction.

Bruch (1957) suggested that childhood obesity was a possible consequence of unresolved hostility. Three Ss were showing moderate symptoms of the Hostility syndrome which is barely sufficient to offer support to the hypothesis.

A number of studies have shown that obese children experience considerable rejection from their peers. The results of the Sociogram were consistent with this. Seven of the ten Ss were scoring at the 24th percentile in class unpopularity or worse. Three Ss were clearly most unpopular.

It may be pertinent that the two Ss who scored above the 50th percentile in the Sociogram were both in an all boys class. All the other Ss were in mixed classes. It is possible that obesity is more of a handicap in mixed classes involving heterosexual relations. But in view of the anonyomity of the voting it was not possible to pursue this.

IMPROVEMENT IN ADJUSTMENT FOLLOWING WEIGHT LOSS

There is some indication from previous studies that weight loss can lead to improved personal and social adjustment. This has been established clearly with adults but evidence with children has been conflicting.

The significant positive correlation (r=.77) between increases in California Personal Adjustment Standard Scores and weight loss (See Table 7) lends support to the hypothesis that weight loss can lead to improved personal adjustment. But similar results were not evident in the final Bristol or Sociogram tests. However assuming that the improved California scores represented real improvement in self image, a time lag could reasonably be expected before the changes in self concept would effect observable behaviour to the extent of being noticed by teachers, or to be acted upon by peers.

PREDICTORS OF SUCCESS IN OBESITY REDUCTION WITH ADOLESCENTS

The significant correlation between the initial California Total Adjustment scores and subsequent weight loss (.74 significant at .02 level) suggested that California test scores could be a useful instrument in identifying those likely to succeed in a school obesity reduction programme. The sense of Personal Worth subscore would seem particularly important. (r=.80 significant at the .01 level). (See Table 7).

The Personal Effort scores on the pre-entry cards which accompany pupils from their Intermediate schools, were also found to have a particularly high correlation coefficient with weight loss (.84 significant at the .02 level). The ready accessibility of this score suggest its value in a school based programme.

IMPROVEMENT IN ACADEMIC PERFORMANCE FOLLOWING WEIGHT LOSS

Success in obesity reduction apparently led to improved personal adjustment and hence it seemed reasonable that it would generalise to improved academic performance.

Despite its lack of significance, the modest correlation (r=.48) between improved academic performance and weight loss, may be indicative of a trend. This is supported by the ...

observation that the one member of the "refused" group (I) who was no longer obese at the end of the year, had improved markedly in his academic performance. (See Appendix K). All the other "refusers" had deteriorated in academic performance. It was E's subjective opinion that all four of these "refusers" at the end of the year were at least as obese if not more so, than they had been when first approached. (See Table 7).

IDENTIFICATION OF THE IMPORTANT FACTORS IN THE TREATMENT OF OBESITY IN A SCHOOL BASED PROGRAMME FOR ADOLESCENTS

(a) Intake Records: Many studies have highlighted the importance for obese adults of intake monitoring. The significant correlation (r=.70) between the number of intake record sheets returned, and weight loss in the first 12 weeks (See Table 7), suggested the similar importance of self monitoring with adolescents.

(b) Increased Exercise: Many reports have highlighted the inactivity of obese adolescents in comparison with their non obese counterparts and by implication (at least) the role of increasing exercise output in achieving weight loss. Seltzer and Mayer (1970) achieved modest results by use of increased exercise.

No attempt was made in the present study to quantify exercise output but perusal of the ideographic material and particularly the weight graphs for K, R, A, S and D suggests the crucial role of increased exercise.

One disturbing trend evident was the feelings of dislike expressed by almost all the Ss, of the School Physical Education programme. It seemed that the school's programme may not have been geared adequately to the special needs of the obese.

(c) Frequency of Weighings: Several studies have investigated the optimum time interval between weighing contacts for adults. The suggested time appears to be between one and two weeks.

The comparison of the holiday weekly weighing group with the group not being weighed for the month suggested that the weekly weighings were valuable.

In the second half of the programme the value of more frequent weighings (twice weekly and daily) was considered. For the period weeks 12-22, there was a marginal increase in the mean weekly weight loss (.30 lb compared to .23 lb).

But on examining each S's results (See Table 8) it seemed that those who had been completing intake records with even moderate regularity were losing weight faster when they had been completing intake sheets. But there were two Ss who completed very few sheets (A and L). For them the intake schedules in weeks 1-12 resulted in substantial weight gains, .8 lb/week and .4 lb/week respectively. Whereas in weeks 12-20, the weight changes were for A .2 lb/week loss, and for L 1.0 lb/week loss - both a substantial improvement. At the end of the programme L identified the frequent weighings as being the thing about the programme which had been most helpful.

One case (S's) seemed to run contrary to this trend. But S had been on a milkrun until week 6. Then when this considerable exercise was discontinued his weight rose sharply ($8\frac{1}{2}$ lb in 4 weeks) and was not checked till he was weighed again after the holidays (week 10).

Excluding S, of the six Ss who returned even a quarter of the intake record sheets, only one (C) did better under the increased frequency of weighing schedules.

However it seems very likely that the order of treatment was important especially in view of the "Plateau" effect frequently noted in weight loss.

(d) Family Support: Several recent studies have highlighted the importance of the family in therapy with children. In an obesity reduction programme involving extensive reprogramming of the food environment, the importance of the family would seem crucial.

The highly significant correlation (r=.78) obtained between the Family Eating Patterns Questionnaire and weight loss was suggestive of the important role of the family. The ..

significant correlation also found between the initial California Family Relations subscore and weight loss r= .66 likewise pointed to the importance of family support.

It possibly suggests that with adolescents scoring low in the Family Eating Patterns Questionnaire, the focus of therapy should be towards increasing family support.

Possibly periodic meetings with all parents once the programme was underway would have yielded improved results.

Unfortunately the limitations of the experimental design in this study prevented comparisons being made about the efficacy of the different schedules. (There was no baseline separating the varying schedules, and no allowance was made for the order factor - particularly important in view of the plateau effect).

However it was clear that increased exercise, self monitoring of intake, constructive family support and weekly weighing and contacts were all helpful. Weighing contacts more frequent than weekly seemed helpful to those not self monitoring their intake.

Further identifying the important factors in treatment could be the focus of further research.

SCHOOL ABSENCE, TRUANCY AND PREMATURE TERMINATION OF SCHOOLING

(a) The highly significant difference in the mean absences each term for the obese group compared with the rest of the Junior School indicated that obese children are absent more frequently than non obese children.

(b) Though no statistical comparison was possible the School Counsellor's subjective opinion was that the truancy rate in the Junior School was very much lower than the data from the 11 Ss would suggest. There was certainly tentative support for the view that obese adolescents are higher truancy risks than the non obese.

(c) In addition to the significantly greater termination rate among the obese, it was noted that many of the 23 non ...

obese school leavers could hardly be classified as premature terminators. Seven of these had been in the remedial 5th form class and two were from the lower stream 5th form technical class. Generally pupils in these two groups are not expected to pass more than one School Certificate subject and many stay at school only till they can find suitable employment.

The teachers subjective comments on the three obese leavers were that all were academically of average or above average ability and they were saddened by their leaving.

For academically capable children the employment they were taking was inappropriate.

While the evidence was limited, it does support the hypothesis that obese adolescents are more at risk with regard to premature termination of their schooling.

OTHER FACTORS

(a) Sex Ratios in the Treatment Group:

There was a marked imbalance of boys to girls in the group (seven boys, two girls). Of the 23 approached E noted 15 who in his subjective judgment appeared to be seriously obese. Males and females were approximately equal in this group. There were eight boys and seven girls. Of these eight boys six accepted and joined the programme though two subsequently dropped out after the initial medical tests. Only two rejected the programme outright. Of the seven girls only one joined the programme. Two others accepted but then terminated their education. Four rejected the invitation to join the programme outright. It seemed that the rejection rate was higher among the girls.

Werkman and Greenberg (1967) in their study with adolescent girls noted their higher levels of defensiveness than their non obese counterparts. There has been no similar study with adolescent boys but it is possible that obese girls are more defensive than obese boys. But it is also possible that being a very sensitive area, the girls would have responded better had a female teacher made the initial approach.

(b) Bus Pupils:

It may not be coincidence that the two Ss whose scores failed to improve in their California posttests were both bus pupils. This meant that arriving at school late, they were only rarely able to meet with the group and hence got no support from other members. Their weighing contacts with E were invariably E initiated, to coincide with E's free time. This inevitably made their situation more conspicuous to their peers. Being bus pupils limited their exercise opportunities. It was generally accepted throughout the school that bus pupils could have more difficulty than their non bus counterparts in identifying with their classes.

It would be wise in future school programmes to ensure contact times do not put such pupils at a disadvantage.

CONCLUSION

In relation to the only other school based obesity reduction programme reported (Seltzer and Mayer, 1970) the results of the present study were good. The mean Ponderal Index gain (.16) was double that reported by Seltzer and Mayer. The mean change in body size was .41% decrease compared with their 5.13% increase. All nine Ss scored better than 5.13% increase.

However only one S achieved a mean weight loss approximating 1 lb/week which could be regarded as the ideal. Four Ss weight was virtually unchanged. At the conclusion only three Ss weights were below the 97th percentile and no S's weight was below the 90th. Though a follow up of the study was planned at the time of writing it had not occurred. It is probable that without a continuing programme many S's progress will be negated.

TABLE 7

WEIGHT LOSS CORRELATED WITH VARIOUS MEASURES

| ITEM | CORRELATION COEFFICIENT |
|---|---|
| INITIAL CALIFORNIA TOTAL ADJUSTMENT | .74* |
| INITIAL CALIFORNIA FAMILY RELATIONS SUBSCORE | .66* |
| INITIAL CALIFORNIA PERSONAL WORTH SUBSCORE | .80** |
| INCREASE IN CALIFORNIA PERSONAL ADJUSTMENT (eight Ss) | .77* |
| FAMILY EATING PATTERNS QUESTIONNAIRE (eight Ss) | .78* |
| OTIS SCORES (seven Ss) | .59 |
| PRIMARY SCHOOL RECORDS PERSONAL EFFORT (seven Ss) | .84* |
| IMPROVEMENTS IN SCHOOL REPORTS (six Ss) | .48 |
| NUMBER OF INTAKE RECORDS RETURNED | .70* a |

a = Intake records were correlated against weight loss for weeks 1-12.

* p = .05

** p = .01

TABLE 8

EFFECTIVENESS OF INTAKE RECORDING SCHEDULES COMPARED WITH INCREASED FREQUENCY OF WEIGHING SCHEDULES

| NAME | NO. OF INTAKE RECORD SHEETS RETURNED | MEAN WEEKLY WEIGHT LOSS DURING INTAKE SCHEDULES (A) | MEAN WEEKLY WEIGHT LOSS DURING INCREASED FREQUENCY OF WEIGHING SCHEDULES (B) | PREFERRED TREATMENT |
|---|---|---|---|---|
| K | 80 | 1.19 | .69 | (A) |
| G | 62 | .26 | .09 gain | (A) |
| S | 46 | .26 | .41 | (B) |
| D | 27 | .45 | .56 gain | (A) |
| R | 27 | .88 | .03 gain | (A) |
| C | 26 | .31 | .63 | (B) |
| M | 24 | .34 | .28 gain | (A) |
| A | 9 | .80 gain | .19 | (B) |
| L | 4 | .37 gain | 1.03 | (B) |

That obesity reduction programmes be held in all secondary schools, ideally as part of the Guidance Network and/or as part of the Physical Education programme.

That height weight measurements be made at least yearly of all secondary school pupils. This would identify children at risk, who could then be approached to take part in an obesity reduction programme.

That where the teacher in charge of such a programme was a male, a female teacher be associated with him and assist (at least) in making initial contact with obese girls.

That high priority be given to parent education with a view to increasing their understanding of how the family's food pattern could be reprogrammed and how best to give emotional support to the obese member attempting to lose weight.

That research be continued on the treatment of obesity in schools, utilising long term follow up.

One particularly important field of research is the further identification of the factors in effective treatment.

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## APPENDIX A

### QUESTIONNAIRE - FAMILY EATING PATTERNS

This questionnaire was administered to the group during week 6. The scoring key is shown in the right hand column.

| QUESTIONNAIRE | FAMILY EATING PATTERNS<br>CONFIDENTIAL | SCORING KEY |
|---|---|---|
| AIM OF QUESTIONNAIRE: | to discover whether the family eating patterns have changed in any way since the programme began and to note the amount of support the family gives you. | |
| 1. Is the family having more fruit and veges since the programme began? | YES NO | Yes 2<br>No 0 |
| 2. Is the family still having as many puddings cakes, soft drinks and sweet things etc since the programme began? | YES NO | Yes 0<br>No 2 |
| 3. (If the answer to 2 was Yes, then please answer 3). Are you still expected to eat the cakes etc? | YES NO | Yes 0<br>No 2<br>No answer 2 |
| 4. If you refuse a piece of cake (or sweet etc) which you like but which the Diet says you should avoid, does the family - | | |
| (a) Notice and say "That's good. Keep it up". | | (a) 2 |
| (b) Not notice at all? | | (b) 1 |
| (c) Nag you to take a piece and eat it? | | (c) 0 |
| | (a) (b) (c) | |
| 5. If you have a binge of overeating one day, does the family - | | |
| (a) Not notice at all? | | (a) 1 |
| (b) Notice but make no comment? | | (b) 2 |
| (c) Notice and try to make you feel guilty? | | (c) 0 |
| (d) Encourage you to go on eating still more? | | (d) -2 |
| | (a) (b) (c) (d) | |
| 6. Do your family encourage you to write down all you eat each day? | YES NO | Yes 2<br>No 0 |
| 7. Do your family note with interest your weight changes each week? | YES NO | YES 2<br>No 0 |
| 8. Have there been any other changes in the family eating pattern? Please list them: | | |

9. OVERALL: Please assess your family's support to lose weight:

| | | |
|---|---|---|
| (a) Very helpful. | (a) | 3 |
| (b) Mostly helpful, but could be more helpful in some ways. | (b) | 2 |
| (c) Very supportive from different family members. | (c) | 1 |
| (d) Not very helpful. | (d) | 0 |

(a) (b) (c) (d)

This questionnaire was used with each S as the basis of a structured interview. It was used prior to and at the conclusion of the programme.

QUESTIONNAIRE

Names and information to be kept entirely CONFIDENTIAL. It may be completed either in written form by the participant, or orally with the Supervisor.

NAME: Age:

Date of Birth:

Number in Family: Parents: Brothers: Sisters:

EATING PATTERN

Be as specific as possible.

1. WHEN DO YOU EAT?

| | | | | |
|---|---|---|---|---|
| Morning | Before breakfast | - Yes | No | Sometimes |
| | Breakfast | - Yes | No | Sometimes |
| | Morning Tea (Snack) | - Yes | No | Sometimes |
| | Lunch | - Yes | No | Sometimes |
| Afternoon | Afternoon Tea | - Yes | No | Sometimes |
| | Dinner (or Tea) | - Yes | No | Sometimes |
| | After Dinner (or Tea) | Yes | No | Sometimes |
| Evening | Supper | - Yes | No | Sometimes |

2. WHERE DO YOU EAT?

| | | |
|---|---|---|
| Always in the same room? | Yes | No |
| Several places (please say where) | | |

3. DO YOU EAT WITH OTHERS OR ALONE?

| | | |
|---|---|---|
| Always with others | Yes | No |
| Usually with others | Yes | No |
| Usually alone | Yes | No |

4. DO YOU OFTEN EAT WHEN YOU ARE FEELING HUNGRY, ANXIOUS OR HURT?

| (Hungry) | (Anxious) | (Hurt) |
|---|---|---|
| Never | Never | Never |
| Sometimes | Sometimes | S ometimes |
| Often | Often | Often |

5. WHAT DO YOU USUALLY EAT? (try to give the amount)

(a) Breakfast (eg. Porridge - 1 plate
Bacon and Eggs
Toast - 2 thick slices
Coffee/Milk - how much)

(b) Morning Tea

(c) Lunch

(d) Afternoon Tea

(e) Evening Meal

(f) After evening meal - Supper etc.

6. DO YOU OFTEN NIBBLE WHEN WATCHING TV OR DOING HOMEWORK? Yes No

7. WHEN DO YOU FIND IT DIFFICULT TO CONTROL YOUR EATING? (eg. Weekends or after School etc)

EXERCISE PATTERN

1. WHAT GAMES DO YOU PLAY? (eg. Netball at School - Tuesday sport)
   (b) How often do you play?
   (c) Do you practise? If so, how often and for how long?

2. HOW DO YOU COME TO SCHOOL?
   (b) How far is it from home to school?
   (c) Do you go home for lunch?

3. WHAT OTHER EXERCISE DO YOU DO (and for how long) DURING:
   (a) a day
   (b) a week
   (c) infrequently

4. WHAT SOCIAL ACTIVITIES DO YOU ENJOY? (also say how often and for how long)
   (eg. Dancing, every Friday from 8 pm - 1 am)

5. DO YOU WISH YOU TOOK MORE EXERCISE? Yes No
   (b) If Yes, what kind?
   (c) How often?

6. DO YOU WISH YOU TOOK MORE PART IN SOCIAL ACTIVITIES? Yes No
   (b) If Yes, what kind?
   (c) How often?

SOCIAL PATTERNS

1. FRIENDS:
   (a) How many friends do you have?

(b) Do you wish you had friends, or more friends, than you have? Yes No

2. HAVE YOU EVER BEEN TEASED OR RIDICULED? Yes No

3. HAVE YOU ANY WORRIES OR CONCERNS Yes No

(b) If Yes, please state them.

4. HAVE YOU EVER BEEN TEASED ABOUT YOUR WEIGHT OR FELT EMBARRASSED ABOUT IT? Yes No

(b) If Yes, has this ever stopped you doing things you would otherwise enjoy?

GENERAL

1. HAVE YOU EVER TRIED TO LOSE WEIGHT BEFORE? Yes No

(b) If Yes, please give details.

(c) At whose suggestion was it?

(d) How successful was it?

2. DO YOU THINK ANY MAMBERS OF YOUR FAMILY NEED TO REDUCE THEIR WEIGHT? Yes No

(b) How many? (specify)

(eg. Mother, older sister etc)

Record sheets supplied to Ss for self monitoring daily intake and daily exercise.

RECORD AFTER EACH MEAL IF POSSIBLE

| DATE: | am | pm | Evening |
|---|---|---|---|
| BREAD & BUTTER 4 slices | | | |
| CEREAL/PORRIDGE 1 serving | | | |
| FRUIT 2 pieces | | | |
| MEAT or FISH 2 servings | | | |
| EGG 1 | | | |
| POTATO (not chips) 1 serving | | | |
| MILK 2 glasses | | | |
| RESTRICTED VEGES 1 serving | | | |
| UNRESTRICTED VEGES & OTHER FREE FOODS | | | |
| OTHER FOODS | | | |

EXERCISE PLAN

for 6 days this week, to increase my activity level by doing at least 15 minutes moderate exercise, daily.

| | ACTIVITY | TIME |
|---|---|---|
| TUES | | |
| WED | | |
| THUR | | |
| FRI | | |
| SAT | | |
| SUN | | |
| MON | | |

SUMMARY OF BEHAVIOURAL CONTROLS OF OVEREATING, AS DISCUSSED WITH Ss AND THEIR PARENTS

Being overweight is the result of more energy being taken into the body (food) than it is using up (exercise). The excess energy is converted into fat.

The following rules have been found successful in helping overweight people control their eating.

THINGS OVEREATERS NEED TO AVOID

1. Avoid eating in lots of different places. People who have got into the habit of eating in the lounge while watching T.V., or while on the phone, or while doing homework, etc., are more likely to experience feeling hungry automatically while doing these things. So, arrange to eat in one room only, in one place of that room and do not do other things at the same time.

11. Avoid buying the wrong foods and bringing them into the home. If cakes, sweets, soft drinks, etc., are not in the home the overeater avoids being seduced by them. But this makes big demands on the whole family. If cakes and other high calorie foods must be in the house, always see that they are out of sight and so at least the temptation is reduced.

Buying lunch at the school canteen can be a particular problem. But the problem can be avoided by always taking a prepared lunch from home using the right foods.

111. Avoid having high calorie condiments on the table. Being readily on hand inevitably means more would be eaten.

1V. Avoid staying on at table when the meal is finished. It is best if the weightwatcher be encouraged to leave the table as soon as he has finished - especially if others have not - and go and do something else that is enjoyable.

V. Avoid leaving scraps of tasty food in the fridge. They are only a temptation and are better being thrown out immediately.

V1. Avoid becoming over hungry. It has been found that most over-eaters are at times (at least) "meal skippers". But meal skipping is dangerous because it means that by the next meal- ...

time one is extra hungry and so likely to have a "binge". Alternatively it leads to large inbetween snacks. Either way many more calories are likely to have been consumed. Avoiding "meal skipping" applies particularly to breakfast.

V11. Avoid being overtired. It has been found that overeating is often associated with periods of fatigue.

V111. Avoid becoming bored. Boredom frequently leads to over-eating.

THINGS TO BE "REPROGRAMMED"

i. The "social environment". In this area the family help is quite essential.

Overweight people invariably complain that their overeating would result in considerable attention (even though it be negative attention). But adhering to the diet would generally go unnoticed. So the family can help by NOT responding to the weightwatcher's overeating but instead responding positively to his keeping on the diet. (It has been found that when the family responds negatively, it leads to increased anxiety which in turn leads to further eating).

Being in the presence of others tends to put us on "good behaviour". So arrange that eating always be done in the company of others.

ii. Food Serving

It has been found best for meals to be served on to plates in the kitchen before being brought to the table. This way no extra food is freely available at the meal itself.

Using smaller sized plates makes a small helping look larger.

The acceptable foods should be made as attractive as possible. By providing a reasonable array of food choices the diet can be prevented from becoming boring.

iii. Slow down the pace of eating. This can be done by deliberately having pauses during the meal. Ensure too that food is properly chewed and swallowed before more is added.

THINGS THAT ACCELERATE CONSTRUCTIVE EATING

i. Use of the daily intake sheets. It has been found that daily monitoring of food intake is one of the most effective aids leading to better eating behaviour and weight loss.

ii. Use of weight graphs, brought up to date at each weighing, provide visually the essential feedback and helps makes the ultimate goal of weight loss more immediate.

iii. It is helpful to keep in focus the immediate and long term effects of continued overeating.

# APPENDIX E

Mean energy expenditure of various activities, issued to Ss to aid them in planning their exercise programmes. (From Stuart and Davis, 1972, 236-237).

## MEAN ENERGY EXPENDITURE OF VARIOUS ACTIVITIES

The values are expressed in calories/minute of gross body expenditure.

| | Body weight, pounds | Calories*/ minute |
|---|---|---|
| **1. Personal necessities** | | |
| Sitting, eating | 143 | 1.5 |
| Sleeping | 150 | 1.2 |
| Washing and dressing | 150 | 2.6 |
| **2. Locomotion** | | |
| Cycling, 5.5 mph | 156 | 4.5 |
| Cycling, 9.4 mph | 156 | 7.0 |
| Cycling, 13.1 mph | 156 | 11.1 |
| Driving a car | 141 | 2.8 |
| Walking, 2 mph | 160 | 3.2 |
| Walking, 3 mph | 160 | 4.4 |
| Walking, 4 mph | 160 | 5.8 |
| Walking downstairs | 161 | 7.1 |
| Walking upstairs | 161 | 18.6 |
| **3. Sedentary occupations** | | |
| Classwork, lecture | 150 | 1.7 |
| Sitting, reading | 161 | 1.3 |
| Standing, light activity | 161 | 2.6 |
| Typing, 40 words/min., mechanical typewriter | 121 | 1.7 |
| Typing, 40 words/min., electric typewriter | 121 | 1.5 |
| **4. Domestic work** | | |
| Bed making | 121 | 3.5 |
| Dusting | 121 | 2.5 |
| Ironing | 121 | 1.7 |
| Preparing a meal | 121 | 2.5 |
| Scrubbing floors | 121 | 4.0 |
| Shopping with heavy load | 121 | 4.0 |
| Window cleaning | 121 | 3.5 |
| **5. Light industry** | | |
| Assembly work in car factory | 121 | 2.3 |
| Carpentry | 150 | 3.8 |
| Farming chores | 150 | 3.8 |
| Farming, haying, plowing with horse | 150 | 6.7 |
| House painting | 150 | 3.5 |
| Metal working | 150 | 3.5 |
| Mixing cement | 150 | 4.7 |
| Stone, masonry | 150 | 6.3 |
| Truck and automobile repair | 150 | 4.2 |
| **6. Heavy work** | | |
| Dragging logs | 143 | 12.1 |
| Drilling coal or rock | 143 | 6.1 |
| Felling trees | 143 | 8.6 |
| Gardening, digging | 139 | 8.6 |
| Pick and shovel work | 143 | 8.6 |
| **7. Recreation** | | |
| Canoeing, 2.5 mph | 150 | 3.0 |
| Canoeing, 4 mph | 150 | 7.0 |
| Cross country running | 143 | 10.6 |
| Dancing, waltz | 167 | 5.2 |
| Dancing, rumba | 152 | 5.7 |
| Golfing | 139 | 5.0 |
| Gymnastics exercises: | | |
| Balancing exercises | 150 | 2.5 |
| Trunk bending | 150 | 3.5 |
| Mountain climbing | 150 | 10.0 |
| Playing baseball (except pitcher) | 150 | 4.7 |
| Playing basketball | 161 | 8.6 |
| Playing football (American) | 161 | 10.2 |
| Playing pingpong | 161 | 4.9 |
| Playing tennis | 154 | 7.1 |
| Playing squash | 147 | 10.2 |
| Playing volleyball | 150 | 3.5 |
| Skiing, level hard snow, moderate speed | 125 | 10.8 |
| Skiing, up hill hard snow, maximum speed | 150 | 18.6 |
| Sprinting | 150 | 23.3 |
| Snowshoeing 2.27 mph | 150 | 6.2 |

*The calorie used in human metabolism is the heat needed to raise the temperature of one kilogram (2.2 pounds) of water from 15 degrees to 16 degrees Centigrade.

Dieting material given by the Diet Department of the Public Hospital.

It was explained that Ss' diets could be expanded so they would be in the 1000-1400 calories range.

DIET DEPARTMENT - PALMERSTON NORTH HOSPITAL

4 MJ = 950 CAL. Diet for Discharged Patients.

| | | | |
|---|---|---|---|
| BREAKFAST: | | | |
| | Bread | 1 oz | 2 thin slices off Barra loaf |
| | Butter | 1/6 oz | 1 teaspoon |
| | Fruit, Porridge or Cereal | 1 serving | see list |
| | Egg or Exchange | 1 | see list |
| | Milk for tea | from Daily allowance. | |
| 10 AM: | Milk for tea | from Daily allowance. | |
| DINNER: | Meat - lean | 2oz | Medium serving |
| | Potato | 2oz | 1 medium or 1 Tbsp mashed |
| | Restricted Vegetable | 1 serving | see list |
| | Unrestricted Vegetable | As desired | |
| | Fruit | 1 serving | see list |
| 5 PM: | Milk for tea | from Daily allowance. | |
| TEA: | Bread | 1oz | 2 thin slices off Barra loaf |
| | Butter | 1/6 oz | 1 teaspoon |
| | Meat or Exchange | 2 oz | see list |
| | Milk for tea | from Daily allowance | |
| | Fruit | 1 serving | see list |
| SUPPER: | Milk for tea | from Daily allowance | |
| | DAILY MILK ALLOWANCE | 10 oz | ½ pint |

DIABETIC SCHOOL LUNCHES:

(a) Sandwiches made from bread allowance filled with part of meat allowance

Remainder as
(1) Hard-boiled egg
(2) Cheese
(3) Cold meat
(4) Cold Fish e.g. Salmon

(b) Clear or thin vegetable soup in thermos flask
Bread and butter as per allowance
Cold meat, egg, cheese, fish etc.
Unrestricted fruits and vegetables
Raw fruit or vegetable - 1 serving

(c) Sandwiches made with unrestricted filling
Cold Meat or Exchange
Unrestricted Salad Vegetables and Fruits
Raw Fruit or Vegetables - 1 serving

(d) Substitute for 1 oz Meat Exchange

CREAM SOUP (4 oz Milk, Water - if desired, 1 tsp Flour, ½ oz Butter) thin white sauce
(+ 1 serving restricted vegetable puree - replacing fruit allowance)

(e) Clear or thin vegetable soup
Plain scone weighing approx. same as bread allowance
NB: Scone must NOT contain sugar
this may be filled with part of meat allowance
Unrestricted vegetables or fruits
Raw fruit or vegetable as per allowance

(f) Hamburger Bun weighing approx. same as bread allowance
filled with (Hamburger - made with meat allowance
Lettuce
a little grated carrot
a little pickle
egg may be used to replace part of meat
tomato
Unrestricted Fruit or Vegetables
Raw Fruit as per allowance

(g) Ryvita Biscuits or Slimryte Rolls - see exchange list.
May be plain or filled (unrestricted filling or part of allowance)
Meat or Exchange to make up allowance
Unrestricted Fruits and/or Vegetables
Raw Fruit - as per list.

SUGGESTIONS FOR SOUPS:

(a) Unrestricted

Beef Tea
Chicken Stock
Onion or unrestricted vegetable soup
Maggi "Instant" stocks
Maggi Onion Soup

(b) Restricted

Fish stock - 6 oz Milk + 1 oz Fish =2
Cream Soup
4 oz Milk )
1 tsp Flour )
$\frac{1}{6}$ oz Butter )
1 serving Veg. Puree )
Water to increase volume

SUGGESTIONS FOR SANDWICH FILLINGS:

Meat Exchange:

CHEESE:
+ horseradish
+ lettuce
+ chutney - small amounts only
+ marmite
+ gherkin
+ asparagus
+ chives
+ cucumber
+ cress
+ celery

EGGS:
+ lettuce
+ chives
+ curry
+ salad dressing
+ gherkin
+ parsley
+ spring onion
+ celery
+ cress

MEAT:
+ lettuce
+ chutney - small amounts only
+ salad dressing
+ curry
+ asparagus
+ spring onion
+ chives

may be: plain
corned or pickled
chicken
mutton
beef
veal
rabbit

FISH:
+ lettuce
+ lemon juice
+ chives
+ celery
+ cress
+ parsley
+ small amount anchovy paste
+ onion

may be: plain
salmon
sardines (drained off oil)
smoked
crayfish
crab
oysters

PALMERSTON NORTH HOSPITAL ST505C

UNRESTRICTED FILLINGS:

| | |
|---|---|
| Lettuce | and Tomato |
| | and Marmite or Vegemite |
| | and Chutney - small amounts only |
| Asparagus | and Lemon Juice |
| Tomato | and Spring Onion |
| | and Cucumber |
| | and Lettuce |
| | and Celery |
| Cucumber | and Lemon Juice |
| | and Chutney - small amounts only |
| | and Tomato |

Chutney should be home-made using an artifical sweetener e.g. Saccharine, Saxin, Sucaryl etc., instead of sugar.

FILLINGS REPLACING FRUIT ALLOWANCE:

| | |
|---|---|
| Dates | and Lemon Juice |
| | or ½ serving dates and ½ serving raisin or nuts |
| Raisins | and Lemon Juice |
| | or ½ serving Raisin and ½ serving Walnuts. |

Dried Apricots and Lemon Juice

or ½ serving Dried Apricots and ½ serving Walnuts.

Unrestricted fruits and vegetables should be added to give "chew value" if above fillings are used.

DIET DEPARTMENT - PALMERSTON NORTH HOSPITAL

REDUCTION DIET INSTRUCTIONS

FOODS ALLOWED WITHOUT RESTRICTION:

Vegetables:

| | | |
|---|---|---|
| Artichokes | Choko | Puwha (Rauraki, Sowthistle) |
| Asparagus | Cucumber | Radishes |
| Beans - French runner | Green Peppers | Silverbeet |
| Broccoli | Leeks | Spinach |
| Brussel Sprouts | Lettuce | Swedes |
| Cabbage | Marrow | Tomatoes |
| Cauliflower | Mushrooms | White Turnips |
| Celery | Onions | Watercress |
| Chives | | |

Fruit:

| | | |
|---|---|---|
| Gooseberries (green) | Guava | Lemons |
| Rhubarb | Melons | Grapefruit |
| Tamarilloes | | |

Beverages:

| | |
|---|---|
| Beef Tea | Lemon Juice |
| Coffee (instant or made from grounds) | Soda Water |
| Clear Soups | Tea (clear) |
| Tomato Juice | Grapefruit Juice |
| Diabetic Lemonade and Cordials | |

Miscellaneous:

| | |
|---|---|
| Bovo, marmite, vegemite | Artificial sweeteners |
| Cloves, sage, herbs and spices | Gelatine |
| Sour pickles | Salt, pepper etc. |
| Vinegar - in moderation | |

FORBIDDEN FOODS:

These foods are forbidden because of their high sugar or starch content.

1. Sugar, glucose, honey, jam, marmalade, syrup, treacle.
2. Sweets, chocolate, biscuits, cakes, pastry.
3. Sausages, saveloys, meat stuffings, luncheon sausage, black puddings.
4. Beer, stout, port, aerated waters such as lemonade, ginger beer etc. cordials, coffee essence bought in bottles.
5. Mayonnaise, soups, and gravies thickened with flour or cereal.
6. Do not use sugar, cereals or breadcrumbs in recipes.

RESTRICTED FRUITS:

All fruits except the few given in the list of unrestricted foods contain sugar. So, you are allowed fruit only when it is written down on your diet sheet and in the amounts given below. Dried fruits should be soaked for 24 hours before cooking. Stewed fruits are weighed without the juice which is added later.

ALL FRUITS ARE COOKED WITHOUT SUGAR. An artificial sweetener may be added.

| | | | |
|---|---|---|---|
| Apples, Raw | 2½ oz | 75g | 1 medium apple |
| Apples, stewed or baked | 3½ oz | 105g | ½ cup stewed |
| Apple juice, unsweetened | 8 oz | 240 ml | 1 cup |
| Apple and orange juice unsweetened | 6 oz | 180 ml | 1 teacup |
| Avocado | 5 oz | 150g | ⅔ avocado |
| Apricots, raw | 3 oz | 90g | 3 lge.halves |
| Apricots, cooked | 4½ oz | 135g | 3 lge.halves |
| Bananas - weighed in skin | 2 oz | 60g | 1 small banana |
| Blackberries - raw | 2¼ oz | 75g | 4 tablespoons |
| Blackberries - cooked | 4 oz | 120g | ½ cup |
| Blackcurrants - raw | 1½ oz | 45g | 3 tablespoons |
| Blackcurrants - cooked | 2 oz | 60g | 4 tablespoons |
| Cape Gooseberries - raw | 3 oz | 90g | 15 fruits |
| Cape Gooseberries - cooked | 5½ oz | 165g | ¾ cup |
| Cherries - raw | 2 oz | 60g | 10 fruits |
| Cherries - cooked | 3½ oz | 105g | ½ cup |
| Chinese Gooseberries | 2 oz | 60g | 1 large fruit |
| Custard Apple | 1½ oz | 45g | 2 tablespoons |
| Feijoa | 3½ oz | 105g | 2 large |
| Figs - fresh | 2 oz | 60g | 1 fig |
| Figs - dried | ½ oz | 15g | |
| Gooseberries - ripe - raw | 3 oz | 90g | ½ cup |
| Gooseberries - ripe - stewed | 5 oz | 150g | 1 cup |
| Grapes | 2 oz | 60g | 12 large |
| Loganberries - raw | 2½ oz | 75g | 5 tablespoons |
| Loquat | 2 oz | 60g | 4 fruits |
| Lychees - dried | 1 oz | 30g | 3 fruits |
| Mandarins, Tangerines | 3 oz | 90g | 3 fruits medium |
| Mangoes | 2 oz | 60g | 4 tablespoons |
| Mulberries - raw | 4 oz | 120g | ½ cup |
| Mulberries - cooked | 4 oz | 120g | ½ cup |
| Nectarines - raw | 2½ oz | 75g | 1 large |
| Nectarines - cooked | 4 oz | 120g | ½ cup |
| Oranges | 2½ oz | 75g | 1 medium |
| Orange juice | 3 oz | 90 ml | ½ teacup |
| Dates, Raisins, Sultanas | ½ oz | 15g | |
| Passionfruit - Black | 2 oz | 60g | 4 fruits |
| Passionfruit - Banana | 2½ oz | 75g | 1 small |
| Pawpaw | 3 oz | 90g | |
| Pears | 3 oz | 90g | 1 small |
| Pears - cooked | 4 oz | 120g | ½ cup |
| Peaches - raw | 2½ oz | 75g | 1 medium |
| Peaches - cooked | 4 oz | 120g | ½ cup |
| Persimmons | 2 oz | 60g | 1 small |
| Pineapple | 2½ oz | 75g | |
| Plums - raw | 2½ oz | 75g | 2 large |
| Plums - cooked | 4 oz | 120g | ½ cup |
| Prunes | 2 oz | 60g | ⅓ teacup |
| Quinces | 4 oz | 120g | ½ cup |
| Raspberries - raw | 2½ oz | 75g | 4 tablespoons |
| Raspberries - cooked | 2½ oz | 75g | ¼ cup |
| Redcurrants - raw | 2 oz | 60g | 5 tablespoons |
| Redcurrants - cooked | 3 oz | 90g | ⅓ cup |
| Strawberries | 3½ oz | 105g | 1 cup |

RESTRICTED VEGETABLES:

When the quantity of each seems too much for a serving, it is suggested that half the amount of each two vegetables be served instead.

| | Weight | Measure |
|---|---|---|
| Beans Broad - V.Young | 150g | 1 cup |
| Beans Baked Tinned | 60g | 2 tablespoons |
| Beetroot Boiled | 105g | ½ cup |
| Carrots Cooked | 180g | ¾ cup |
| Carrots Raw | 180g | ¾ cup |
| Chestnut - no shell cooked | 45g | 3 tablespoons |
| Chestnut - no shell raw | 30g | 3 chestnuts |
| Corn Sweet or pirau | 60g | 3 tablespoons |
| Carrot and parsnip Mashed (Half/Half) | 120g | 4 tablespoons |

RESTRICTED VEGETABLES:

When the quantity of each seems too much for a serving, it is suggested that half the amount of each of two vegetables be served instead.

| | | |
|---|---|---|
| Beans - broad | 125gms | 1 cup |
| Beans - baked, tinned | 15gms | 1 tablespoon |
| Beetroot - boiled | 105gms | ½ cup |
| Carrots - cooked | 180gms | ⅔ cup |
| Carrots - raw | 180gms | ½ cup |
| Chestnut - no shell, cooked | 45gms | 3 tablespoons |
| Chestnut - no shell, raw | 25gms | 3 chestnuts |
| Corn - sweet or pirau | 50gms | 3 tablespoons |
| Kumera | 45gms | 2 tablespoons |
| Lentils - cooked | 30gms | 2 tablespoons |
| Lentils - raw | 15gms | 1 tablespoon |
| Parsnip | 75gms | 4 tablespoons |
| Peas - fresh or frozen | 90gms | ⅓ cup |
| Potato | 60gms | 3 tablespoons |
| Pumpkin - no skin | 105gms | 5 tablespoons |
| Rice - cooked | 60gms | 3 tablespoons |
| Yams | 45gms | 2 tablespoons |
| Peas, - dried, split, uncooked | 15gms | 1 talbespoon |
| Pearl Barley - uncooked | 15gms | 1 tablespoon |

SAVOURIES FOR BREAKFAST, LUNCH & TEA:

On your diet sheet you will notice that these savouries are the equivalent of 1, 2, or 3 eggs; or 30g, 60g or 90g meat. We do not expect you to have that number of eggs, or that amount of meat in a day, but just to use this as a standard for which there are many substitutes and thus give you a wide variation in your diet.

Listed below are the substitutes for 1 egg or 30gms meat. For example; if you are allowed 1 egg for breakfast you may have an egg or any one of the foods on the list below in the amount given. If you are allowed 2 eggs, double the amount e.g. in place of 2 eggs you may have 1 egg and 30g bacon, or 60g bacon and grilled tomatoes (these are allowed without restriction) or 90g fish and so on.

For your lunch and tea dish do the same thing, and, if you are hungry include a salad made from foods on the unrestricted list or a clear soup, either vegetable or beef tea, in addition to your diet.

Substitutes for 1 Egg or 30g Meat:

| | | |
|---|---|---|
| Meat | 1 oz | 30gms |
| Egg | 1 | |
| Cheese | 1 oz | 30gms |
| Poultry | 1 oz | 30gms |
| Crayfish, Prawns, Paua | 1¼ oz | 22.5gms |
| Fish | 1½ oz | 45gms |
| Ham, Bacon | 1oz | 30gms |
| Kidney, Liver | 1oz | 30gms |
| Oysters | 2½oz | 75gms |
| Sweetbreads | 1oz | 30gms |
| Tongue | 1oz | 30gms |
| Tripe | 1½oz | 45gms |
| Whitebait | 1¼oz | 22.5gms |

THE FOLLOWING FOODS MAY BE SUBSTITUTED FOR EACH OTHER - in the quantities stated - NOT added.

| | |
|---|---|
| Bread | 20gms |
| 1 Weetbix, or cornflakes | ½ oz = ¼ cup |
| Rice Bubbles | ½ oz = ¼ cup |
| Puffed Wheat | ½ oz = 1 cup |
| Porridge (cooked) | ½ cup |
| Fruit (raw or cooked) | 1 serving - see list |
| Potatoes | 1 serving - see list |

| | |
|---|---|
| Restricted Vegetables | 1 serving - see list |
| Orange Juice, fresh | 90 ml |

Wheatgerm - a little may be sprinkled on porridge or fruit as an extra.

SUGGESTIONS FOR EXCHANGE FOR 90gms MEAT:

1. Lettuce Salad with
   a) 2 eggs and 30g meat.
   b) 2oz meat and 30g cheese.
   c) 30g meat, 1 egg, & 30g cheese.
   d) 90g meat.

Stuffed Egg Salad:

| | |
|---|---|
| 2 hard boiled eggs | 30g grated cheese |
| Vinegar, lemon or tomato juice | Salt and pepper |

Mix yolk of egg with cheese and flavourings. Replace in whites. Service on lettuce.

2. Steak & Kidney:

| | |
|---|---|
| 60g Steak | 30g Kidney |
| 1 large Tomato | Onion |
| Cook in casserole | |

3. Bacon & Cheese Savoury:

| | |
|---|---|
| 60g Cheese | 30g Bacon |
| Spread over bread allowance. | Grill or bake. |

4. Kidney & Bacon Roll:

| | |
|---|---|
| 60g Kidney | 30g Bacon |

Wrap bacon around kidney and bake.

5. Egg & Tomato:

Break 2 eggs into ¼ cup tomato juice in a pie dish. Bake gently. Have 30g cheese at the same meal.

6. Welsh Rarebit:

Beat 2 eggs and 30g grated cheese with seasoning and a little chopped tomato. Heat gently till cheese melts and egg is cooked.

7. Eggs on Spinach:

Toast bread allowance, butter and cover with chopped cooked spinach. Add 2 poached eggs. Have 30g cheese at the same meal.

8. Stuffed Tomatoes:

1 or 2 large firm tomatoes. Remove top and scrape out pulp. Mix with 3oz chopped ham, chopped parsley and celery. Refill shell with mixture and serve.

9. Savoury Custard:

| | |
|---|---|
| 1 egg | 30g cheese or substitute - see list. |
| 6oz milk | |
| Seasoning. | |

Beat egg, milk and seasoning. Pour over cheese and bake in moderate oven.

10. Tomato Custard:

| | |
|---|---|
| 1 egg | Sliced raw tomato |
| 6oz milk | Seasoning |

Make as above. Serve with 1oz bacon.

11. Vegetable Custard:

| | |
|---|---|
| 1 egg | ½ cup unrestricted vegetables (cooked) |
| 6oz milk | |

As above. Serve with 30g cheese or 30g bacon.

12. Fish:

Baked in milk, or milk and tomato juice - 4½ oz.

13. Fish & Cheese:

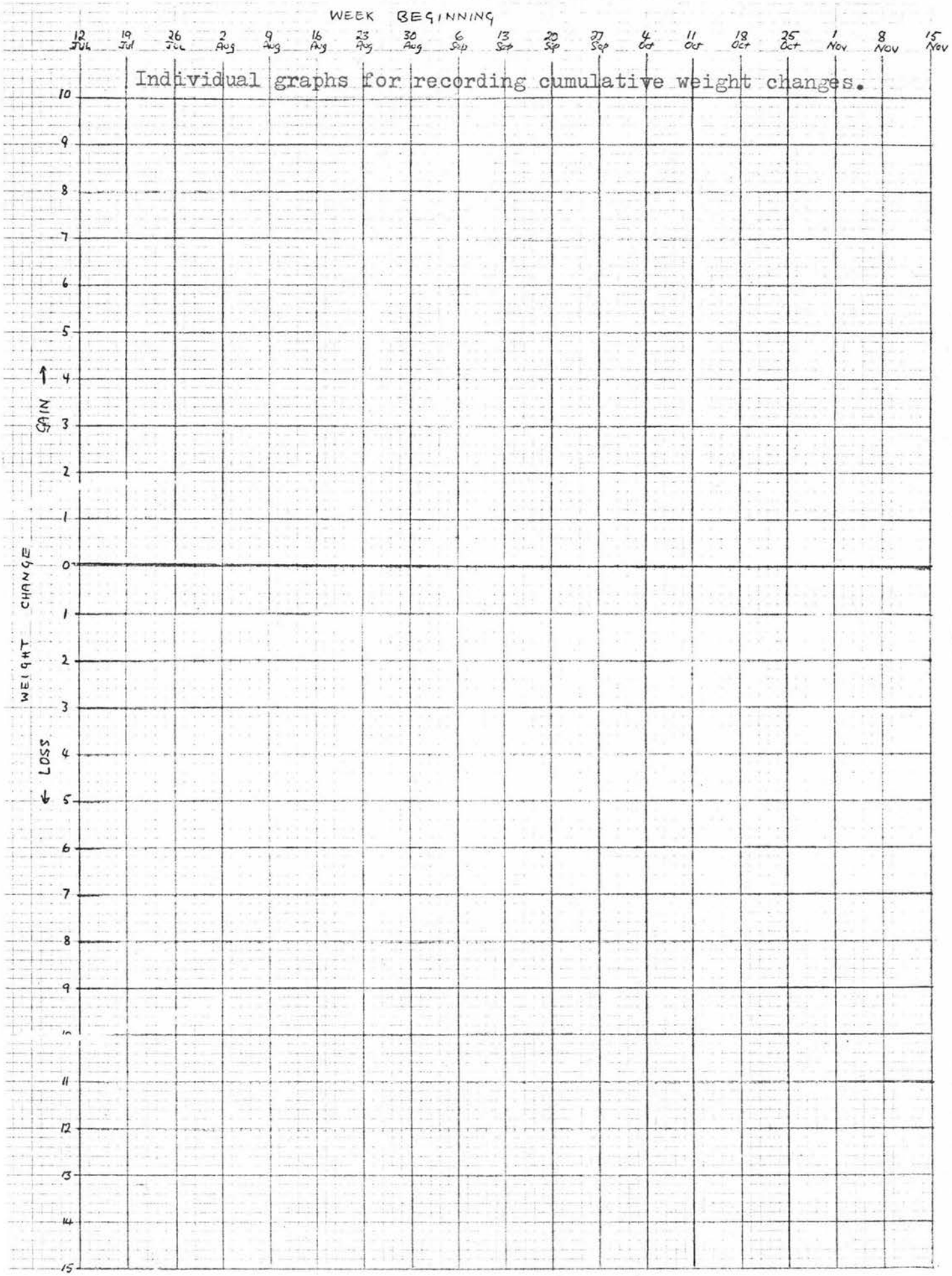
90g fish. Grate 30g cheese on top. Bake in oven in a little milk.

SALAD DRESSING:

Moderate amounts of this dressing are allowed for salads.

| | |
|---|---|
| Water | ½ cup |
| Vinegar | 2 tablespoons |
| Mustard | ½ tsp. |
| Pepper | A little |
| Salt | ¼ tsp. |
| Egg | 1 beaten. |

Cook together over hot water until mixture coats the back of a wooden spoon. Remove and add 1 crushed saccharine tablet. Stir well.


WEEK BEGINNING
12 JUL
19 Jul
26 Jul
2 Aug
9 Aug
16 Aug
23 Aug
30 Aug
6 Sep
13 Sep
20 Sep
27 Sep
4 Oct
11 Oct
18 Oct
25 Oct
1 Nov
8 NOV
15 Nov
Individual graphs for recording cumulative weight changes.
WEIGHT CHANGE
↑ GAIN
↓ LOSS
10
9
8
7
6
5
4
3
2
1
0
1
2
3
4
5
6
7
8
9
11
12
13
14
15

Letter sent to all Ss' parents.

Freyberg High School
PALMERSTON NORTH

Dear

I am writing to each parent during these August holidays to let you know how the group as a whole is going so far.

But first I want to thank you for the obvious support you are all giving. It is not easy losing weight and that the group as a whole is doing well, is, I feel, in large measure due to the support of the parents.

Nearly all in the group have lost weight. So far the whole group has lost 22 lb which averages out at exactly 2 lb loss for each person. Two in the group have each lost roughly half a stone, and one other, 5 lb, which is very good. And bearing in mind that the end of term is a pretty tense time for some students - especially for 5th formers with their exams - the result for the group as a whole is pretty creditable.

The result of Dr Malcolm's medical checks showed that all in the group were close to or markedly over the "97th percentile" for teenagers of their height. To be above this figure is generally regarded as being dangerously overweight. When the new term begins I will be discussing with each member what might be a realistic target weight, to aim at getting down to, and staying at.

From the results I have been able to compile so far, several things stand out very clearly.

Most important of all is the practice of writing down everything that's been eaten each day. The results show that those who are consistently using the diet record booklets are the ones who are losing most weight, whereas those who are only using the booklets spasmodically are barely losing weight at all, or even putting weight on.

Knowing that you are going to have to write down all you've eaten (especially the things you should have avoided) seems to be a very strong aid to help you keep you on the diet.

So please, do encourage the writing down of everything eaten. This should be done at least each day - preferably after each meal.

Each member in the group has a stamped addressed envelope to use in the holidays, so he can post me his daily sheets.

It is also clear that those who are doing best are those who <u>feel</u> the most support from their families. There are several ways you might be able to make the family's support more helpful.

All on a diet sooner or later have "binges". If this happens it has been found that it is best for the family to notice the overeating but NOT try to make the overeater feel more guilty. If he is made to feel more guilty this only increases his anxiety level and most overweight people react to increased tension by wanting to eat more. And this then becomes a vicious circle. This may seem strange but the results I have compiled so far, certainly confirm it.

It is good to see that many of you have changed the whole family's food pattern - at least to some extent. Most of you I gather, are having more fruit and veges and have cut down on cakes and puddings or cut them out altogether.

If you do still have cakes and puddings please make sure that it's easy for the "weightwatcher" to avoid them. It is suggested that he leave the table during pudding time and go and do something else he enjoys. Also if you do still have cakes and biscuits, please make sure they are not openly displayed but are away in time.

Of course the most effective family support is where another family member is also following the programme. Interestingly the two in the group who have done best have both had others in the family trying to reduce weight also. Perhaps if you too are a bit overweight you could join the programme also.

Up to now we have been relying entirely on dieting to reduce weight. After the holidays end I want to introduce increased exercise into the programme. Other studies with overweight teenagers have shown the importance of increased exercise. With some people it has proven even more important than diet.

I will be asking each member to undertake at least 15 minutes exercise activity each day over and above what he is doing now.

It is important that whatever is chosen is something that will be enjoyable. This could mean jogging each night for 15 minutes or extra cycling or joining a sports team, or perhaps even taking up a paper or milk run. Alternatively I could suggest a programme that has been worked out by our P.E. dept at school. Perhaps you could discuss this together.

I am including with this letter some "Reduction Diet Instructions" papers. These are based on the information the Hospital Dietition gave us at the start of the programme. You may want to read them again and keep them handy for reference.

If there is anything you wish to discuss with me, please feel free to ring me either at school or at home.

Yours sincerely

# APPENDIX I

## FAMILY EATING PATTERNS QUESTIONNAIRE SCORES

| NAME | SCORE |
|---|---|
| S | 12 |
| D | 13 |
| L | 10 |
| M | 11 |
| K | 17 |
| R | 14 |
| C | 13 |
| G | 9 |

MEASURES OF SCHOOL SUCCESS PRIOR TO ENTRY INTO SECONDARY SCHOOL

| NAME | OTIS SCORE | PERSONAL EFFORT SCORE |
|---|---|---|
| S | 99 | 5 |
| D | 109 | 4 |
| M | 114 | 4 |
| K | 124 | 9 |
| A | 95 | 4 |
| R | 99 | 7 |
| G | 93 | 7 |

ACADEMIC IMPROVEMENT SCORES OF THIRD AND FOURTH FORMERS INVITED TO PARTICIPATE IN THE OBESITY REDUCTION PROGRAMME

| NAME | ACADEMIC IMPROVEMENT SCORE |
|---|---|
| Ss in Programme | |
| K | $12\frac{1}{2}$ |
| S | 4 |
| D | $-\frac{1}{3}$ |
| A | $-1\frac{2}{3}$ |
| R | $-4\frac{1}{3}$ |
| C | $-4\frac{2}{3}$ |
| Declined to participate in Programme | |
| I | $11\frac{2}{3}$ |
| J | $-4\frac{1}{3}$ |
| Mi | $-8\frac{1}{3}$ |
| Db | $-9\frac{2}{3}$ |
| B | $-14\frac{1}{3}$ |

PUPILS APPROACHED WHO DID NOT PARTICIPATE OR WHO WITHDREW FROM THE OBESITY REDUCTION PROGRAMME

| | | | E's SUBJECTIVE EVALUATION OF DEGREE OF OBESITY | |
|---|---|---|---|---|
| NAME | SEX | FORM | INITIAL | FINAL |
| | PUPILS WHO DECLINED TO PARTICIPATE | | | |
| Ma | F | 5th | gross | a |
| Y | F | 5th | gross | a |
| I | M | 3rd | Moderate | Not obese |
| B | F | 3rd | gross | gross |
| Mi | M | 4th | gross | gross |
| J | F | 4th | gross | gross |
| Db | F | 4th | gross | gross |
| A1 | F | 4th | gross | b |
| G | M | 5th | moderate | moderate |
| P | M | 5th | moderate | Not obese |
| Dv | M | 5th | Moderate | Not obese |
| Ji | F | 5th | mild | unknown |

a Left school within a month of being approached.
b Left school within 3 months of being approached.

| PUPILS WHO WITHDREW SOON AFTER PROGRAMME BEGAN | | | | |
|---|---|---|---|---|
| St | M | 3rd | gross | gross |
| W | M | 5th | gross | moderate |