Weight Reduction Problems as Shown by a Review of Literature and a Survey of Weight Reduction Groups

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AND A SURVEY OF WEIGHT REDUCTION GROUPS

by

Naomi Jensen
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Naomi Jensen

Report No. 1 submitted in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

in

Food and Nutrition

Plan B

Approved:

UTAH STATE UNIVERSITY
Logan, Utah

1964
ACKNOWLEDGMENT

The author wishes to express her gratitude to Dr. Ethelwyn B. Wilcox for help in initiating this problem and for suggestions, counsel, and guidance throughout the entire program (since its inception in 1958). She also wishes to acknowledge her appreciation to Dr. Margaret B. Merkely, Dr. Eldon Drake, and Dean Phyllis Snow, and to Elna Miller for special assistance and encouragement.

Acknowledgment is made especially to those persons in the weight control groups who so willingly cooperated in this study.

Naomi Jensen
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INTRODUCTION

America has been known throughout its history as a land of plenty. Enough food to feed a rapidly increasing population has been produced continuously. Scientific progress has made it possible for fewer farm workers to produce larger amounts of food both from increased acreage and increased yield per acre. With today's nationwide network of distribution, these foods have been made available throughout all sections of the country. Modern science and industry have taken over many of the processing duties of the homemaker and have done it on a less expensive and a much safer scale. Food of any season from any geographic area is within economical reach of the American consumer.

Today's families are better fed than those of a generation ago. Malnutrition or undernutrition is present where socio-economic conditions are on the lowest level but, generally, it is distinctly uncommon to find such cases. Instead, there is more and more concern over the increasing number of overweight and obese persons. Obesity is the number one health problem in the United States and weight control is called the "American Preoccupation." Twenty to forty percent of the American population is above the ideal weight for age and height. No age group has escaped; overweight appears with increasing frequency from infancy to old age.
What is obesity? Mayer (61, 62) defined it as the presence of an excessive amount of fat. He used the term "fat" rather than "weight" because the excessive amount of adipose tissue is the important factor. A person is assumed to be overweight if weight is more than 10 percent above normal weight for height and age. If the weight is more than 20 percent above normal, the person is said to be obese.

There is evidence that the magnitude of the obesity problem is growing (39). Modern living with its automation, sedentary work, increased availability of foods in many forms with appearance and high quality emphasized are the prime cause.

Many factors are involved in the problem of obesity. Overweight when not excessive can be controlled by balancing the amount of food eaten with the energy expended. However, recent studies have shown that we can no longer explain obesity as simply the result of overeating. Fellner and Levitt (20) explained obesity as a psychosomatic condition of a nonspecific nature. Mayer (58) divided obese individuals into regulatory and metabolic types in addition to genetic, traumatic, and environmental. Young (102, 103) reported that obesity is a symptom of some underlying difficulty which may be psychological, sociological, cultural, economic, or physiological.

It has been established that persistent obesity and overweight impair health and shorten life (88). Obesity and overweight favor cardiovascular renal disease, appendicitis,
biliary calculi, liver and gall bladder cancer, diabetes mellitus, hypertensive vascular disease, and arthritis (39, 88). Mental and social factors are also of vital importance.

Overweight and obesity with their concomitant effects were found to be genuine problems in Summit County as was common in other areas of the state and in the United States. The women in this county asked for help in reducing and in maintaining their weight. Seven weight reduction groups were organized during 1958 and 1959 with 154 individuals enrolled. In several instances, the weight reduction therapy was a family project. In 1964, a group in Logan became the nucleus for a guided program in weight control.

Interest in working with the problems of overweight and obesity and the added incentive of personal involvement were responsible for the studies reported here. There was also need to assemble the information on weight reduction and weight maintenance as it appears in current professional and scientific literature.
REVIEW OF LITERATURE

Need for weight reduction

Years ago, overweight was considered a sign of success and prosperity. In all civilized communities, the privileged person with unlimited supply of food was traditionally portrayed as a fat person. A man who was fortunate enough to provide himself and his family with plenty of food let rotundity speak for his comfortable position in life. Plumpness, especially through the hips, was thought to enhance a woman's charm. To call a person stout was highly complimentary as it meant stalwart and brave (5). Portly did not mean fat, but rather dignified, imposing, and stately; corpulence was a symbol of affluence and vitality. Down through the ages man has seen obesity as the fulfillment of a wish, a longed-for ideal of plenty to eat. Large sections of mankind today look on body weight in the same way. The search for sufficient food, more than anything else, has determined human history (5, 7). It is only in an economy of plenty and superabundance that obesity becomes a public health menace.

In addition to overabundance, America has the extra problem of the attitude of immigrant parents. They have brought from the old world a background of struggle for existence and, often, of poverty and starvation. In the old country a well-nourished child was a sign of success and
they cannot understand why anyone should object to overweight or even obesity. Another carryover from their old-world background is the inability to throw away any food (7). The small amounts left over after meals become dangerous as the housewife eats them rather than throw them away, which results in what Bruch has called "garbage pail obesity" (7).

The Eastern world always has held being fat in high esteem. This is evidenced by the yearly reports that were made on the weight of the late Aga Khan. The well-to-do Chinese tend to be obese and want to be so.

Only the ancient Greeks and Romans had a contempt for obesity. The writings of this period definitely show this attitude. Hippocrates described obesity in great detail and outlined a regime that prescribed moderate exercise and moderate eating.

During the past two decades the Western World has expressed a similar attitude and it is now a predominate feature of living. Low caloric foods have increased in variety and in amount and the preoccupation with their use has invaded almost all aspects of daily living. Our cultural pattern demands that an obese person control himself. Today's "Man of Distinction" is never a fat man and a slender, girlish figure for women is the ideal. Many persons consider obesity a moral sin because its presence is evidence of glutony and selfishness; others condemn it for aesthetic and social reasons.

As the factual knowledge on the whys of obesity expands, and as the attitude that obesity is not a moral issue changes
to one of obesity as a disease or syndrome, a more realistic conception of overweight and obesity is achieved. Research emphasis is shifting from the problems of undernutrition to those problems concerned with overweight. During the past decade researchers have been concerned with obesity as a menace to happiness, peace of mind, and health. In 1900 when large sections of the population suffered from inadequate diets, infectious diseases, such as tuberculosis or pneumonia were the primary health problems (54). Now when overeating has become so prevalent, cardiovascular and other degenerative diseases are more important.

Life Insurance companies were the first to call attention to the relationship of overweight to mortality (7, 38, 39, 54, 80). They claim that fatness far from being a sign of health is instead a prime contributor to body ills and health risks. Fish (32) reported that 50 pounds overweight imposes as much extra mortality as valvular heart disease. Studies made of life insurance company records (32, 54, 83) have given data which have led to the conclusion that overweight shortens life. There is a much greater risk for men than for women in the early decades of adult life. Although the difference is lessened at about age 50, in later life mortality rates of obese men are still almost double those of obese women.

There is an expanding body of factual knowledge and evidence is increasing steadily to indicate that excess body fat may be an etiological factor in several principal diseases and hastens their downward course, particularly cardiovascular
diseases. It has been particularly noted that obese individuals have an increased incidence of diabetes mellitus, atherosclerosis, hypertension, cerebral strokes, kidney failure, liver diseases, all bladder diseases, and arthritis. They are greater surgery risks and have a shortened life-span (7, 22, 23, 39, 47, 49, 54, 83, 88).

Rinzler (74) reported that the risk of development of coronary heart disease in men aged 45 to 62 years who were obese and hypercholesteremic was 14 times greater than in men of normal weight with normal cholesterol levels. In the Framingham study (45, 69), which was included in Rinzler's report, it was found that obesity, although not a direct cause, was one of the principle factors associated with increased risk of developing coronary heart disease.

Stamler and coworkers (83) reported that it is possible to predict who is susceptible to coronary heart disease. They listed hypercholesteremia, hypertension, obesity, diabetes mellitus, heavy cigarette smoking, and certain abnormal electrocardiogram as contributing factors. If an individual had any two of the first three conditions, the risk of experiencing clinical coronary heart disease before age 65 was one chance in two. A study made by Salzano et al. (76) on the effect of weight loss on blood pressure showed that after weight reduction there was an 81 percent decrease in systolic pressure and a 62 percent decrease in diastolic pressure.

Abnormal liver function tests and changes in liver morphology have been found to be present usually in obese individuals (2).
This knowledge regarding the effect of obesity on morbidity and mortality, as well as the desire to conform to today's cultural pattern to remain young and slender, induces many obese people to try to lose weight.

Not all research workers agree on the exact definition of obesity. McCracken (66) defined obesity as merely meaning "fat" as distinct from "thin." Mayer (61) used the word "fat" not "weight" because obesity is concerned with an excessive amount of adipose tissue. According to Bruch (7) overweight means a weight that is higher than what is considered the normal weight. Generally, the term overweight means an excess of 10 to 20 percent in body weight in relation to height and age and obesity refers to an excess of over 20 percent above the normal weight for height and age (7, 22).

Many researchers are concluding that the problem of overweight and obesity is an individual one and differs with each person (7, 102, 103). Hence, it is difficult to give a normal weight for each height and age group or, for that matter, an ideal weight. Olsen (72) called it "desired" weight and explained desired weight as the average weight at 25 years of age. Bruch (7, 9) questioned the validity of using terms such as "normal" and "ideal." She claimed that many people could not attain the statistical measurements they "should" have. Rather, weight needed to be looked upon as something each individual used in its own preferred patterns. She proposed the term "preferred weight" and defined it as the weight the individual, in his self-regulatory capacity, preferred. This weight often did not
coincide with what physicians considered desirable. Because of body build most people cannot attain a model's form and dimensions or even approach it. If much of the weight is carried on the thighs, for example, it may be good muscle tissue and not fat. Other people do not have good health unless they maintain a certain weight which in all probability is above the value given in the weight charts for body build, age, and height. Hence, these people should reduce only to eliminate excess fat and then learn to make the most of the figure that they have. Thus, each person has his own desirable weight.

Methods used in measuring overweight

The question arises as to how overweight can be recognized and how it can be satisfactorily measured. It can be recognized by several means or a combination of these means. Mayer (61) recommended that under office conditions, the best way to determine whether or not a person is fat is to look at him. If he looks fat, he probably is fat. The "pinch" test or skinfold test may be used here as further evidence (7, 61, 66, 80). The "pinch test" is a measurement of the thickness of the folds of skin and subcutaneous fat in various body sites. It is determined by taking a skinfold picked up between the fingers and estimating the thickness or measuring it with constant pressure calipers.

Densitometry and the estimate of the total body water are two methods which have been devised in recent years to obtain more direct measurement of body fat in relation to the
lean tissue (7, 66). The principle on which densitometry is based in that the fat, active tissue, bones, and extracellular fluids of the body have different densities. Density is the relationships of the gross weight to the volume as determined by immersing the individual in water. The estimate of the total body water is made by using a labeled substance which is nontoxic, stable, water-soluble, and that penetrates all tissues. Thus the dilution principle can be employed. The total water in the body tends to be regulated closely at a constant fraction of the active tissue or lean body mass and it is on this principle that the second method is based. Generally, both methods are used in the research laboratory.

One of the simplest methods is the use of tables based on the relation of weight to height and age. The height-weight tables are inadequate, unsatisfactory, and hard to use according to several workers (61, 66, 80) and can only give results when an individual is so fat and so overweight that there is not much doubt about obesity (61). The difficulties are due to the lack of standard conditions under which the available figures have been obtained, the wide variation in apparently normal people which makes it necessary to use the arbitrary terms, small, medium, and large "frames," and the fact that an average value for a population does not necessarily mean the normal or optimum. From the tables, many athletes would be rated obese and they are obviously not so. By giving recommended weights instead of average weights, the more recent tables listed by insurance companies
have gone a long way to overcome some of these difficulties (66).

Gubner's "The Perfect 36 Index" is still another measurement which can be used (28, 80). This measurement is obtained by subtracting the individual's circumference of waistline in inches from his height in inches. The desired range would be 36 to 40; moderate obesity would be 25 to 30; and 25 or less would be marked obesity.

McCracken (66) advised that for practical clinical purposes the best method for the diagnosis of obesity is simple inspection, supplemented by the skinfold test. Simple inspection could be made by any individual who will look at himself in a mirror, without clothes. Rolls of fat that can be grasped by the hand indicate obesity.

Prevalence of overweight

There was no real knowledge of the extent of overweight and obesity until after 1900 when the keeping of height-weight charts was begun in the United States. Overweight has been reported by researchers as being in the 10 to 40 percent range, depending on the segment of population sampled and the method of sampling used (7, 22, 39, 66, 75).

Adults. Lew (54) in 1961 reported that studies of build and blood pressures made in 1912 and 1931 showed relatively little change in the weight of the American people. However, a 1959 study showed marked changes with overweight a major problem, particularly in the years past middle life. Twenty-six life insurance companies conducted a study of 5 million
insured persons during the period of 1934-1954. From these records average weights for men and women were developed for use by the insurance companies. Results, as reported by Lew (54), indicated that 20 percent of the men and 25 percent of the women in the study were 10 percent or more above the average weight. Five percent of the men and 10 percent of the women were 20 percent or more above.

Roberts in 1960 (75) reported that overweight affected one out of four people. Swanson et al., 1955 (92), in a study of women over 30 years of age in the North Central region, found that two-fifths of the group were overweight in respect to ideal weight and one-fourth exceeded the ideal weight by 20 percent. In 1961 Mullins (3) reported a study of the obese patients in a London out-patient clinic. He found that of the 373 patients, 26 percent of the men and 44 percent of the women were more than 20 percent above standard weight. The average incidence of obesity in this study was 30 percent.

A study in 1959 of 681 people over age 65 revealed that 11 percent of the males and 16 percent of the females were 20 percent or more above average weights for their heights and age (37). In the 55-59 year-old group 10 percent of the males and 8 percent of the females were 20 percent or more heavier than the average weight in the tables used by insurance companies. Thirty-one percent of the females and 26 percent of the males of those who were within 20 percent of average weight at time of the study had at some period exceeded the
average weight by 20 percent or more. These data suggest that the prevalence of obesity was as great or greater than among younger adults.

Life insurance studies have indicated that perhaps one-fifth of the adults over 30 years of age are overweight enough to affect their health (39). Data from these as well as other studies, point to the fact that overweight and obesity affect one out of every four to five adults and establish that this health condition is a common affliction.

Children and adolescents. Until recently, there were few studies on the problem of obesity in children. Johnson et al. (41) made a study of school records of 6346 children in two communities within the greater Boston area. The results indicated that more than 10 percent of the children were overweight. From the point of view of development, two types were found to be most common: "persistent obesity," which was present throughout the school record and comprised one-third of the overweight girls and almost one-half of the overweight boys; and "late obesity," present during the latter half of the school record, which comprised 12 percent of the overweight girls and over one-third of the overweight boys.

In a study made of Iowa girls 12 to 14 years of age by Hinton (36), it was found that nearly twice as many of the girls were overweight as were underweight. Weight status was: underweight 21, normal 37, and overweight 41 percent. Another study of Iowa children (19) showed that on the Wetzel
grid, thinness and stockiness were about equal in boys; in girls, stockiness was more frequent than thinness, especially during the teen-ages. One-fourth of the girls were very heavy or obese.

Hathoway and Sargent (33) reported on a series of studies made on obesity in children. Included in the report was the Iowa study mentioned above and studies in Maryland, Oregon, Washington, and Maine. The incidence of obesity in these studies based on weight-for-height relationships ranged from 10 to 40 percent. Maretzki and Dodd (57) reported a study of 76 college girls in a weight reduction group. Twelve of the girls were moderately overweight and 10 of them were severely overweight, which meant that 29 percent of them were above normal weight. To 77 percent of the 12 overweight girls, the reduction program was a repeated effort.

Nutritionists and physicians who have been making a study of overweight and obesity are becoming more and more concerned with its prevalence in the early age range (48, 52, 55, 66, 99, 103). These studies have shown that overeating patterns set during infancy and early childhood carry over into adolescence and adult life. In the study made by Mullins (3) of obese patients in London, it was found that approximately one-third of the obese groups (5 men and 27 women) had been cases of persistent juvenile obesity. When the degree of obesity was classed as mild, moderate, or severe depending on the percent overweight, 53 percent of those classified as severely obese were in the juvenile obese group,
but only 12 percent were mildly obese. Studies by King (48) and Young (103, 104, 107), as well as this study by Mullins, suggested that juvenile obesity made up a very significant proportion of adult obesity and that the juvenile obese patients tend to predominate among those adults who are severely obese. According to Young (107), the age of onset of obesity was of a more important consideration in determining whether the person could reduce than was the duration of obesity.

A certain weight excess is sometimes a part of the rapid growth and development of children, especially during puberty. Bruch (7) reported that in a review of literature she had made, as well as from her own studies, she had found that obese children were not short and stunted in their growth and development as could be expected if they had been suffering from any degree of thyroid or pituitary deficiency. She also discovered that the contrary was true, that obese children were definitely taller than normal children and the tendency to be tall often preceeded the development of obesity. Statistics from insurance company studies have indicated that 10 percent overweight is a health advantage up to age 25 (39).

The growth pattern of today's children has been accelerated over that of previous decades. Because children today are better fed, they are growing more rapidly and can be expected to attain a given height and weight at an earlier age. In Stuttgart, Germany, there has been a progressive
increase in height and weight in school children, interrupted only by World Wars I and II (24). Japanese children who have been raised in America are larger than their brothers left at home. During the past 50 years, American boys have increased in height by 6 to 8 percent and in weight from 12 to 15 percent (24, 81). These increases in height and weight are normal increases which are indications of a higher level of nutritional intake and are not related directly to the problem of overweight.

Sexual maturation is another indication of better nutritional intakes. According to Forbes (24), the average age of menarche in normal individuals has shown a progressive decline over the past years. Bruch (7) reported that in overweight and obese children puberty occurred early in many cases and was definitely not delayed. Many attained it earlier than nonobese children.

**Metabolic disturbances associated with overweight**

Medical authorities and nutritionists are continually stressing the fact that overeating results in overweight and obesity and affects the functions of the body and general health of the individual. There are some metabolic disturbances which are worthy of consideration.

Many overweight and obese individuals have referred to a "low basal metabolism" as one of the underlying causes of obesity. Bruch (7) and others have reported that the basal metabolic rate is not as significant in weight reduction as
the individual sometimes deems it to be. Bruch asserted that the measurement of basal metabolism is overrated, gives little information, and is most deceptive because of: 1) the many variations of conditions present at the test even when controlled as much as possible; 2) the individuality of the person being tested; and 3) the inconsistencies of the comparisons. This is especially true with children. The methods used and the great number of details needed for obtaining a basal metabolism rate seems to be more effective psychologically than physiologically. Studies have shown that the basal state, which shows the amount of oxygen burned at resting level, does not vary with obese and nonobese individuals, that is, obesity is not caused by lessened expenditure of basal energy (7, 69).

Fat metabolism and fat storage are metabolic factors which have received a great deal of attention, even as far back as the beginning of the century. Overweight and obesity are regarded as an indication of an excess of adipose tissue beyond the amount normally present. When an individual's intake in calories exceeded his output in energy, the surplus was stored as adipose tissue. The accumulation of fatty tissue must be regarded as stored energy. Many believed this adipose tissue was a specific organ (27, 66). Until recently, scientists have believed that adipose tissue was in a static form, but now it is known to have a relatively rapid turnover and high metabolic activity (7, 27, 28, 66). Adipose tissue is composed of about 15 percent water, 62 percent fat, and 24
percent cellular matter. Also, it has been known that fat
tissues are not the same in all parts of the body (7). Fat
is lost or accumulated to a different degree in different
areas of the body by each individual.

McCracken (66), in his review of obesity, reported that,
whether its onset was acute or gradual, there is a tendency
for weight to increase for a certain time and then to level
off or reach a plateau where the weight stays almost constant.
This will be followed again by an increase of weight if weight
control is not practiced.

Periods of rapid weight gain frequently are accompanied
by an appreciable rise in serum cholesterol. Fat deposits
are synthesized from serum fatty acids and carbohydrates (28,
42, 43, 44). Insulin is required for the process of storage,
and so when the amount of adipose tissue is large there is
strain on the insulin mechanism. Predisposition to diabetes,
both latent and overt, reflects this. Researchers have
suggested that the increased incidence of diabetes in obesity
may be due to the prolonged overproduction of insulin (94).
Several studies have shown that many obese individuals are
what is called "prediabetics" (28, 94). "Latent diabetic"
obese women have higher total lipid and triglyceride levels
than do those of the "nondiabetic" obese women which are
also higher than those for women of normal weight. Also
some of these women have a tendency toward an abnormal glucose
tolerance curve, even though they have no diabetes. Waxler
(94) suggested that this finding might partially explain why
some obese persons have cardiovascular difficulties. Schlecter
et al. (77) reported that oral glucose tolerance test and glucose-insulin tests administered to obese women showed that the dynamic phase of obesity is characterized by increased carbohydrate tolerance and decreased insulin sensitivity. In the static phase the glucose tolerance test is decreased and the insulin sensitivity is similar to that of nonobese individuals.

There is lessened utilization of fat in the obese but this is believed by some to be related to a decreased degree of physical activity and a lowering of basal caloric requirements with advancing age. The heightened caloric and fat consumption of obese people, storage impairment, and lessened fat utilization affect the serum transport mechanism. The heightened serum cholesterol levels in obesity reflect this situation. Fischer (21) in his study of military population found that there was no significant relationship between serum cholesterol and body weight per se, but that there was a direct relationship between serum cholesterol and obesity. Other workers have also shown that as weight decreases, the serum cholesterol level decreases (12, 28, 70, 94). Joliffe and his coworkers (42, 43, 44) reported similar results; but attributed part of the decrease to a high ratio of polyunsaturated fat to saturated fat. They were using the Prudent Diet which is a diet where vegetable oil is substituted for most of the animal fat, fish is used frequently during the week, and total calories are controlled. After 6 months on the Prudent Diet, they found that the group cholesterol
levels had fallen from a total of 551 to 222 mg. per 100 ml. Results in the Framingham study (45) were not wholly in agreement with those found when using the Prudent Diet. Lipid concentrations of obese hypercholesteremic men tended to return to previous levels after a new caloric equilibrium had been established.

Loss of protein during weight loss seems to be a controversial issue. Some researchers claim that the adipose tissue is lost before the body begins to use the protein and point to the fact that a nitrogen balance is maintained (7). However, some studies have shown that in certain people adipose tissue and protein are depleted together for a short time at the beginning of the weight reduction program. Ohlson (69) reported that in subjects who were on diets which supplied less than 1000 calories and 50 grams of protein there was nitrogen loss indicating that body protein was being used. Christian and coworkers (14) reported that, in their studies of 51 individuals, the lean body mass remained constant and the total weight loss resulted from loss of excess body fat.

Later research has shown that many of the metabolic processes in the body are interrelated. Findings regarding processes, such as the Kreb's cycle, have helped for better understanding and, therefore, better diagnosis of the overweight problem (7). According to Shank (23), there is no change of abnormality in body chemistry or in metabolic pathways in obese individuals. He suggested that it could be highly probable that the rates of some of the reactions
in energy metabolism may be varied, thus allowing for positive energy balance and the accumulation of body fat.

Two recent studies (79, 96) have shown that the serum iron levels of adolescent boys and girls were considerably lower than those for nonobese adolescents, also hemoglobin levels were lower. These findings indicate that more study is needed. Physical inactivity, shortness of breath, and ease of fatiguability are characteristics of iron deficiency as well as obesity.

Factors influencing weight

A study of the factors influencing weight reduction needs to be approached from two angles: first, what factors are responsible for weight gain; second, what factors influence weight loss. In many instances these factors or combination of factors are the same.

The essential cause of overweight and obesity which is overeating may be a symptom of some underlying difficulty resulting from different conditions (7, 8, 48, 52, 53, 61, 62, 66, 90, 103, 104). According to Mayer (61) many health agencies are quite satisfied with the blanket statement that people are obese because they eat too much. However, this does not explain the mechanism or mechanisms involved in regulating food intake. These mechanisms are not fully understood and the factors for determining appetite are subjects of controversy (7, 24, 61, 66, 73, 84). Mayer and others (58, 59, 61, 62, 63) reported that various areas of the body are known to be concerned with the mechanism: first,
the gastro-intestinal tract with the presence of gastric contractions; second, various areas of the central nervous system, especially the hypothalamus and the thalamus. Studies on mice have led to the conclusion that the ventromedial area of the hypothalamus was the one which was essentially concerned with the adjustment of food intake to energy output and that carbohydrate metabolism, as it takes place in this area, is responsible. This glucostatic theory has been accepted by many researchers (7, 66).

Prugh (73) reported that appetite was derived from psychologic stimuli at higher, principally cortical, levels of the central nervous system.

According to Bruch (7) the regulation of increased food intake can result from an increased activity of the feeding centers or a decreased activity of the satiety centers. Disturbances are due to a great number of factors, although the cause may not be known definitely. For example, it is not known whether a person becomes hungry more often because he can not mobilize his fat or because metabolism in the direction of complete oxidation is not stimulated due to a continuous oversupply of food.

Because there are many kinds of obesity, Young (103) and Stare (84) have called them obesities. Both researchers, as well as others (7, 58), have designated two principal types: regulatory obesities and metabolic obesities. Regulatory obesity occurs when the central nervous system mechanism is at fault because of either psychological or neurological
disturbances. This is the more prevalent form. Metabolic obesity involves basic biochemical mechanisms which are part of the overall metabolism of the individual.

According to Leverton and others (52, 63), there are various kinds of imbalances which are responsible for overweight. The basic imbalance is between the amount of energy obtained from food intake and the amount needed for normal growth and activity. An individual becomes overweight when his food intake exceeds his energy output. Modern living is the greatest contributing factor (53, 62, 63, 84). The automobile, labor-saving devices, shorter working hours, industry doing more of the work previously done in the home, longer life expectancy, and inactive recreation (movies, T.V.) have all contributed. This decrease in energy output is accompanied by factors which are conducive to increased food intake: better economic level, availability of food, attractive food packaging, food promotion on T.V. and in the women's magazines, greater ease of food preparation, more socializing, and more eating out. These probably are the factors most responsible for "creeping" obesity.

Several studies (40, 66, 84, 92) have shown that many times the caloric intake of the obese individual did not exceed that of the nonobese individual. In fact, frequently caloric intakes were smaller. Inactivity of these subjects was much more important than overeating. Eating patterns and amount of food for the breakfast and luncheon meal were frequently similar. Between-meal eating and snacking patterns
varied according to age of individual. It was at the evening meal and during the evening hours, that the obese individual often markedly increased caloric intake.

The above factors, responsible for an increase in weight, also are responsible for the difficulty in decreasing weight or in maintaining weight loss. When overweight and obesity are caused by overeating alone, the individual needs an extra amount of will-power to combat the environmental situation.

Closely correlated with overeating is activity or the lack of it. Mayer (61, 62) and Stare (84) have claimed that exercise is grossly underemphasized or minimized, especially with children. A study of calorie requirements for various activities showed that walking, depending upon speed, costs 150 to 400 calories per hour above basal; and running, 800 to 1000 calories (84). The cost of activity which involved the displacement of body weight was in proportion to the body weight of the individual. Hence, an overweight person will burn more body reserves for the same amount of exercise than will a nonobese person. A 20 percent increase in weight will increase the cost of an exercise or activity by 20 percent. A physically active person will make only a modest gain in weight if there is an increase in caloric intake. On the other hand, a sedentary individual will use less energy and so weight gain will be more rapid. A pound of excess fat equals 3500 calories and it will take 12 to 18 hours to "walk it off." The cost is the same whether the walking is done at one time or over several periods of time. It is not known
how much exercise is needed to offset food intake but it is known that in America the average person's activity is low.

Mayer and his coworkers (63) found that caloric intake increased with activity but only within a certain zone. However, with strenuous exercise, appetite increases and the extra food ingested might lead to an increase in weight. Moderate or mild exercise did not increase the appetite and, therefore, decreased weight. Walking at a moderate pace has been found to be one of the best forms of exercise for weight reduction. Thus, exercise is good only if it is carried out frequently, consistently, and in moderation. It seems best to develop such habits of physical activity in early childhood.

Several studies have indicated that inactivity of the individual may be more influential than caloric intake in causing overweight and obesity. Mayer (60) reported a study of over 200 overweight adults which showed that a decrease in activity directly resulted in the beginning of obesity. In another study of 160 obese boys and girls, 67 percent of the boys and 88 percent of the girls were inactive. Stefanik et al. (86) reported that overeating, or eating more than a normal amount, was not typical of obese boys. Their "overeating" resulted from an energy expenditure below the energy intake even though intake was moderate for their sex and age group. This study showed little difference in the amount of time for exercising but the degree of participation in active exercises was generally less for the obese boys than for the nonobese boys.
A similar study was made of adolescent girls (11, 60) with the same conclusions. Abnormally low physical activity rather than excessively high caloric intake was associated with the development or maintenance of obesity. Johnson et al. (41) found that the onset of overweight took place during winter months, thus emphasizing the importance of inactivity in the development of overweight.

Another imbalance to consider is in the food selection (52, 53). Many popular foods have an imbalance because they are high in calories in relation to their other nutritive values. Some patterns of food selection include these high calorie foods in excessive amounts so that the energy requirements of the individual are met or exceeded very quickly. The meal pattern, number of times that food is eaten per day, and methods of food preparation may lead to overweight. When caloric intake is controlled, the number of meals may vary from 3 to 6 with satisfactory control of weight. If high calorie foods are added too frequently for social and psychological satisfactions, the amounts often exceed the energy needs and weight is gained.

Broiled foods, with less fat than deep-fat fried ones, and fruits instead of rich desserts, are two examples of methods of preparation that may be used to induce weight loss.

The business man's pattern of conducting business over a luncheon or dinner table with excess food and thus excess calories is also conducive to weight gain.
The number of different foods offered at any one meal may be another factor of concern. If one is frequently tempted to eat too large a quantity of each food offered, excessive eating and overweight results. At banquets and Christmas feasts this is especially true. Stare (84), however, maintained that an individual does not become overweight between Christmas and New Year, rather between New Year and Christmas.

Family eating habits are other environmental factors to be considered. Children imitate parents (35, 53, 55, 66, 78, 99) and habits of gorging are acquired early. An excessive food consumption is equated with pleasure, security, and an appreciation of good cooking. The amount of food available to an infant can affect its eating pattern through life. Early feeding of solid food to infants, many times before the infant is physically ready, may lead to the habit of overeating (73). Some individuals may be obese because of conditioning to increased food intake when babies. The concept of parents that a large baby or a rapidly growing child is the healthiest needs to be changed (103). Mothers may place an excess of food before small children and then hesitate to reduce the overweight child for fear of damaging growth. Obesity developed in childhood will usually carryover into adolescence and from adolescence to adulthood. King (49) noted that the earlier in life the trend of overweight begins, the more difficult it is to correct the pattern.

A large proportion of obese children have obese parents. Mayer (61) reported that if one parent is obese, 40 percent
of the children are obese; if both parents are obese, 80 percent of children are obese. In a study of adolescent
girls, Bullen et al. (10) found a significant correlation
between obesity of the mother and that of her daughter. They
also found that 44 percent of the fathers of obese girls were
obese while only 11 percent of the fathers of nonobese girls
were obese. In response to a questionnaire included in this
study, the nonobese girls implied a family life of sociability
and unity while the obese group depicted a less unified
family.

Family attitudes and family criticisms have often deter­
mined the eating behavior of adolescents (7, 35). Selection
of diets leading to overweight and obesity may be the result
of family criticism for not eating the right foods, for eating
too much, for eating too often, and for eating too slowly.

Socio-economic status also has been related to obesity
(103). Families with low incomes tend to select poor diets.
Obesity was found to be seven times higher in these families
than in those at higher economic levels.

Hormonal or endocrine factors do not have as large a
role in overweight and obesity as was previously thought (7,
10, 55, 66, 73, 87). Lowry (55) reported that less than 1
percent of the obesity in children was due to endocrine factors.
Myxedema, Cushing's Syndrome, Fröhlich's Syndrome, hypo­
thyroidism, and insulin producing tumors of the pancreas will
yield some degree of obesity; however, other disturbances
caused by endocrine dysfunction are usually apparent. The
ordinary obese person will show no evidence of thyroid disturbance or pituitary abnormality.

There are many problems of overweight and obesity related to emotional and psychological adjustments. Often such adjustments are difficult to make and some researchers (7, 8, 66, 89, 90, 103) have reported that emotional instability is fairly prevalent in obese individuals. When following a weight reduction program the emotionally unstable person often became more unstable and some cases have resulted in mental breakdowns.

Since today's culture frowns upon overweight and obesity and emphasizes the desirability of the slim figure, overweight and obese individuals often feel uncomfortable, defensive, insecure, and rejected by their peers. This applies to obesity in all ages, but it is especially true of adolescents who are the ones most affected by cultural and social rejection (8).

Suczek (89, 90), as well as others, reported that the obese individual often had an exaggerated valuation of food and used the eating of food to satisfy some emotional need or to provide other satisfactions. According to Bruch (7, 9) many people have used overeating and being big as a balancing factor in their adjustments to life. Even though ineffective, it represented the best form of adaptation possible for these people. Without the comfort of eating, life could become so threatening and lacking in satisfactions that mental illness could be a danger and obesity served as a protection against more severe illness.
Suczek (89) in a study of the personalities of obese women, reported that a majority of them had a high degree of Narcissistic strength, interpersonal dominance, psychological strength, and a denial of weakness. Their very size contributed to this attitude. On the other hand, Monello and Mayer (68) found that obese adolescent girls showed personality characteristics that were similar to traits to ethnic and racial minorities. There were traits such as an obsessive concern with one's status, passivity, and withdrawal.

Gallagher (25) reported that adolescents were great imitators and that they learned more from examples set than from lectures and advice; that they live for the moment so they are interested in quick results and are not impressed by warnings of 20 years hence. They have a great deal of self-concern and, yet a desire for acceptance by their peers.

Bruch (7) has maintained that the basic cause of obesity in children is associated with the parent-child relationship. The outstanding emotional factor, she reported, was that parents were using their children as compensations for severe frustrations and disappointments in their own lives. In most of the cases studied, the mother was dominant and over-protective of the child. In such a situation, food had an inordinate importance.

According to Young (103), the greatest success in weight reduction and weight maintenance was likely to be found in individuals who were in the earliest stages of obesity, who developed obesity in adult life rather than in childhood, and
who had a reasonable degree of emotional stability. Maretzki and Dodd (57) reported that successful weight losers viewed themselves as calm, leisurely, and uninhibited while unsuccessful weight losers thought of themselves as tense, active, organized, practical, and demanding.

The motivation for weight reduction must be meaningful and realistic in order to make weight reduction most successful. To some the motivation is health, but to the majority it is personal appearance. Young women want to be attractive to young men and young men want to be muscular and attractive to young women (78). This concept does not fit obesity. A knowledge of nutrition is another factor which will motivate an individual.

Methods used in reducing weight

Almost every obese person hopes to find an easy way in which to reduce weight. Unfortunately, there is no magic formula although innumerable methods have been proposed, tried, abandoned, and resurrected. Diets of many kinds, systems of reducing, use of vibrators, hypnotism, drugs, tablets and pills, "complete formulas," fasting, nibbling, and many other methods have been recommended for weight reduction.

The food faddist and the super-salesman, who are not always concerned with scientific nutrition, have realized the emotional value of foods and have played upon emotions such as hope, fear, and superstition in order to "sell" their particular idea (71). Overweight and obesity often
are included in these promotional schemes. Restricted menus such as bananas and milk, steak and prunes, and raw tomatoes and hard boiled eggs have been advocated as being specially useful in reducing weight. Many persons believe that certain foods or systems of dieting have specific value out of proportion to the established facts of diet therapy. Stone (88) reported that food quackery had been estimated as a half billion dollar business annually.

Quackery in overweight and obesity programs is not limited to the promotion of diet formulas or diet systems. There is a superfluity of literature on the subject available in booklet and pocketbook as well as regular book form. Each writer advocates his particular diet scheme in such convincing terms that readers may find it difficult to differentiate between fact and fallacy.

According to Todhunter (93), harm from food faddists and quacks has been because misinformation is expensive: purchase of some special produce or preparation at a high cost is required; use of the preparations frequently leads to nutritionally inadequate diets; and use of the product gives a false feeling of security which actually might be harmful. Leverton (50) asserted that the faddist had made his business flourish because of the appeal, the glamour, and the touch of a magic he gave it. He can be completely unscrupulous in his claims and promise quick results. He can appeal to the feeling in each person that his weight problem is individualistic.
Physicians and nutritionists have reported that the key to successful weight reduction followed by lifetime weight control is medically supervised dieting, exercising, and psychological help where needed. Mayer (73) and others have professed that the treatment of obesity had to be on a long-term basis; that short-term treatment meant nothing. He claimed that the treatment really began when the patient and his family had accepted the idea that their mode of life in relation to food habits, exercise habits, and general outlook needed to be changed.

Young (100) recommended that the place to start in helping an obese patient was to remove him from the defensive position, to help him realize that weight was not a moral issue and that he was not to be judged nor chastized. Her next step was to group the patients according to their emotional stability. She felt there were three groups: first, those who seemed to be reasonably stable emotionally; second, those with superficial emotional problems; and third, those who appeared to have deeper emotional problems. Then weight reduction therapy for each group was planned as needed.

Stare (85) and others have reported that weight loss has been achieved with the establishment of new balances between food intake and energy output. This has been done by lower food intake and the same physical activity; by the same food intake and increased physical activity; or by a combination of a little less food intake and a little more exercise. This has been the safe method of weight reduction.
Success in weight reduction and in maintaining the proper weight after reduction requires re-education of eating habits (98). Individuals soon have to learn to like and to eat more of the highly nutritious, moderately caloric foods and to choose less of the highly caloric foods. New eating patterns must be established.

The persons for whom weight reduction by dietary means has been most successful are those who are emotionally well adjusted, are in the early stages of overweight or obesity, have developed obesity in adult life rather than childhood, have no previous history of weight reduction failure, have a reason and motivation for losing weight that is meaningful and have a realistic goal (29, 30, 101). There have been therapeutic limitations in dieting as evidenced by the number of people who failed to reduce or who regained any weight lost. In cases where emotional factors have been a part of weight reduction, psychotherapy help was necessary before a successful weight reduction program could be established. Several researchers (7, 29, 30, 101, 102) have reported that not all obese persons should undertake weight reduction. Bruch (9) claimed that it was necessary to keep the mental health aspect in mind when planning a weight reduction program and that a reducing regimen should be undertaken only by those overweight people who are emotionally well enough to carry it through.

The majority of overweight individuals in this country are busy, reasonably active people who have become overweight
because of overeating. Whatever emotional difficulties they experience are usually not too deep-seated and with a realistic approach and the correct use of will power may be solved. In order to lose weight, then, they must have less food intake while at the same time learning new patterns of eating. According to Young (101), any low caloric diet could be a good one for reducing purposes if it meets the following criteria: it satisfies all nutritional needs except calories; it is planned as closely as possible to the dietary habits and tastes of the individual; it protects the individual as much as possible from between meal hunger and leaves him with a sense of well being and little fatigue; it is easy to obtain whether at home or away from home and does not ostracize him from his group; it is one which can be followed over a period of time and can re-train eating habits so that, with a few caloric additions, it may become a pattern for lifetime eating.

A low calorie diet must be based on the individual's energy needs (69, 75, 101). A pound of body weight is equal to 3500 calories; hence, a deficit of 500 calories a day will result in one pound weight loss a week. If the caloric level is too low, the individual will supplement as he chooses. A low-calorie diet of 1000 to 1400 calories for women and 1500 to 2000 for men is usually recommended.

The daily pattern for a low-calorie diet that Young (101) recommended for nutritional adequacy included one pint of milk, one egg, two servings of meat, fish poultry, or substitute; four or five servings of fruits and vegetables;
one leafy green or yellow and one rich in vitamin C; one or more servings of whole grain or enriched bread or cereal, depending upon caloric allowance; one or more teaspoons of table fat or oil. This diet pattern follows closely the low calorie, high protein, moderate fat, low carbohydrate diet recommended by Ohlson (69) and the Exchange Diet recommended by the American Dietetic Association (56).

Young and coworkers (105, 106) conducted studies on step-wise weight reduction which involved short periods of weight reduction alternated with periods of controlled weight maintenance until the desired weight was achieved. There appeared to be no physiological advantage to this method but, from a psychological standpoint, 77 percent preferred the step-wise method.

The daily food requirements may be divided into a 3-meal pattern or into 5 or 6 smaller meals per day. This latter method has been called "scientific nibbling." There have been some physicians who have advocated the nibbling diet for weight reduction. Available results suggest that man may be benefited by increasing the periodicity of his food intake. It has been suggested that the day's food be divided into three equal feedings and that each of these meals be divided into two or three feedings. One of the problems involved has been to alter the social custom of three meals per day. Although the "coffee break" has made a beginning break from custom, it must be planned nutritionally to fit into the day's menu.

After weight is reduced, the maintenance of the ideal
weight is often difficult and has produced continuous problems. The majority of individuals soon return to their former weight. The diet planned for weight reduction should be one that can be adapted to a weight maintenance program. Dole (80) does not believe that an obese individual who has reduced can be expected to stay thin on a diet equal in caloric value to the diet of a thin person. He found that the total expenditure of energy of overweight people after reduction may be only one-third or one-half of that of normally thin persons of comparable age, height, and sex. Young (105) found that the basal requirements at the end of eight weeks caloric restriction decreased a mean of 6.8 percent for young women and 8.5 percent for young men. Such persons eating the same food as normal persons would regain weight.

Lowry (55) reported that the diet planned for an overweight or obese child needs to be appropriate to the degree of activity that the child has and to the family’s cultural pattern. He felt that the diet should give the child a sampling of all types of foods, including a few desserts, and should be low enough to cause a moderate weight loss. Weight reduction diets for teen-agers follows the same dietary pattern as the diet for adults. Growth needs to be taken into consideration for teen-agers just as it is for the obese child. One of the problems that has to be met here is the fear of overweight, especially among girls (82).

Goldman (26, p. 78) who carried out a successful weight reduction program for himself, reported his program for
losing weight. He asserted that the three keys to weight reduction are 1) motivation; 2) rapport with doctor and rest of family; 3) the food you eat. He also used the following seven ways to achieve his goal in weight reduction:

1. Decrease the total amount of food consumed. Leave something, a little food, on the plate of each course at each meal.
2. Decrease the actual size of the portions. We all know down deep how much we eat of specific high-calorie foods. Cutting down the size of portions is not an insurmountable task if one sets out to do it faithfully.
3. Eliminate certain high-calorie foods, at least at one or two meals out of three. Why cut down on good-tasting, fatty foods like butter, bacon, and cream? Because they can make you fat. It's as simple as that.
4. Substitute certain foods for others which have higher calorie content. Important: the substitute foods are just as tasty...as the more fattening foods and provide just as much mealtime enjoyment.
5. Decrease intake of fried foods and increase intake of boiled and broiled dishes. Why? In fried foods, you get the caloric value of the food itself, plus the calories of the medium (oil, fat, butter, lard, etc.) in which it is fried.
6. Add fluids to total intake—to replace between-meal nibbles and other fatteners.
7. Increase energy expenditure, physical activities, slightly, and maintain that increase on as many days of the week as possible.

Weinstein and Scoville (95, p. 520) reported that the main factor in successful weight reduction was the patient's own enthusiasm and willingness to fight discomfort and temptation and to stick to a rigid program. They proposed the following "Ten Commandments for Reducing" which are closely correlated with Goldman's suggestions:

1. Retain the basic foods which supply the necessary proteins and vitamins.
2. Eliminate unnecessary fats and sweets.
3. Use judgement in preparation of foods, e.g., mushrooms (virtually no calories) to
decorate meat; strawberries or cantaloupe for attractive desserts.

4. Don't skip meals; over-hunger is followed by overeating.

5. Slice foods thinly. An ounce of sliced beef looks and tastes like much more than a one-slice ounce.

6. Eat slowly.

7. Taste your food as you eat it. The results are more satisfying.

8. Use a smaller-than-average plate. Psychologically, the meal looks large.

9. Include food of high satiety value.

10. Dieting may be forever. As one grows older, caloric demands decrease. Re-educate your eating habits.

A form of weight reduction highly advertised over the years has been the formula diet. Dietary formulas have included the milk diet, milk-and-banana diet, milk and corn-oil diet, the high-protein diet, and various formulas such as the Hollywood, DuPont, Rockefeller, Mayo Clinic, 7-day, 9-day, 12-day, Good Housekeeping, and McCall's diets.

The formula diets which are on the market today in increasing numbers have gained in popularity with weight watchers. There are currently 60 to 80 different types of 850, 900, and 1100 calorie "complete formulas." The advantages claimed for the formula diets are that they eliminated guesswork and inconvenience (13, 85). The physician who used a 900 calorie formula diet knew the caloric intake of his patient and could predict weight loss in advance. The formula diets removed the patient from the table and eliminated the anxieties in trying to plan low calorie diets. However, caution in the use of such diets has been recommended by the Council on Food and Nutrition of the American Medical Association (15). Moderately overweight individuals probably could use them with relatively small
success in losing weight, but obese individuals should use them only under the direction of a physician. The important goal in a long-time weight control program is educating the patient in good and bad dietary habits and this is best achieved by building diets around ordinary foods. Formula diets do not help establish new eating patterns. They can become monotonous to use and are suggested for use only by people who need a crutch in order to get started and then only for a short period.

Appetite depressant drugs have been used as a treatment for obesity. According to Modell (67), the large group of drugs which are called anorexiants do not depress the abnormal appetite drive directly, but rather distract the patient by central nervous system stimulation. They supply short-lived symptomatic relief only and do not contribute to any re-education of eating habits. They seem to be useful only as adjuvants to a carefully controlled diet and, occasionally, in some kind of psychotherapy.

At the present time, fasting is being used in the treatment of obesity. It is not a new method but seems to have gained new popularity. Several physicians have used this method and have reported apparently satisfactory results (6, 16, 17, 18). The patients all were excessively obese and usually had a history of several failures at weight reduction. Fasting periods lasted from 7 to 14 days, 12 to 117 days, and 4 to 14 days. Patients who use this method need to be hospitalized, and at bed rest. Bloom (6) claims that there
is an immediate rapid weight loss; one pound to two and one-half pounds loss per day has been reported. There is a changed level of satiety, a great deal of self-education, new self-respect, and self-discipline. However, this loss in weight has not always been maintained.

Artificial sweeteners and artificially sweetened products have increased in production and use by calorie-conscious individuals (4). There has been an increase of 6 percent over the past 18 months. Ten percent of the drinks on the grocery shelves are now artificially sweetened. In a survey conducted in 1956 (65), it was found that there was no significant difference apparent when weight loss of users and non-users was compared. One of the problems involved in the use of artificial sweeteners is that the individual relies wholly or mostly on this method to lose weight. However, he does not achieve a sufficient decrease in caloric intake to control or reduce his weight.

Many individuals have felt that weight reduction can be more successful if done on a group basis. However, Young (107) reported that in a community nutrition clinic, where conditions were conducive to maximum success in weight reduction, about one-fourth of the patients were reasonably successful; one-fourth had some degree of success; one-fourth had such little success that the therapy could hardly be considered justifiable; and one-fourth were complete failures. Sussman (91) in a special study of a group weight reduction program in New York State, found that most of the beginners
dropped out quite rapidly. The weight reduction attempt was a repeated effort for many of them. He attributed their lack to success to lack of leadership within the group, internal conflicts and instability of many of the individuals, and the problems that overweight and obese women have to face in today's world.

Studies made of the effectiveness of group therapy after a few years have shown that the most lasting effects and best carry-over have been when basic nutrition education was included (31, 34, 64, 108, 109). Also of importance were the number of times an individual completed a group therapy program.

Kenneally (46) reported the results of a pilot study on group therapy in weight reduction. The results suggested that such a method could be successful if the person had sufficient motivation to attend meetings and if the group therapy was continuous for a long enough period of time.

The most effective and long-lasting method in weight reduction is the prevention of overweight and obesity. Eating habits are established in early childhood and follow family eating patterns (39, 58, 66, 78, 107). It is in this area where education should begin; first, with the parents and then the child. Eppright (19) reported that after 12 years of age, girls showed an increased tendency to overweight. She recommended that nutrition education should begin here.

Leverton (51) recognized the need for a new approach for teaching nutrition to teen-agers. The past attitude of eating certain foods "because they are good for you" needs to be
changed to an attitude that "eating well will help you in what you want to do."

Sebrell (78) suggested the need for a community weight control program that was based on good health education and not alone on weight control education. The need has been to teach that adequacy means more than adequate calories and that the accumulation of excess body fat at any age is dangerous to health and is undesirable.
METHODS

Review of literature

Articles on obesity in the professional and scientific literature and authentic books on weight reduction were read and abstracted.

The abstracted articles were classified as follows:
A. Need for weight reduction
B. Metabolic disturbances
C. Factors influencing weight reduction
D. Methods used in reducing weight

Weight reduction groups

Summit County groups. Five weight control groups were organized in 1958 and two in 1959 in Summit County as follows:

1. Coalville I . . . . May 1958
2. Coalville II . . . . May 1958
3. Henefer . . . . April 1958
5. Wanship . . . . August 1958
6. Park City . . . . January 1959
7. Kamas . . . . April 1959

One hundred fifty four women were enrolled in these seven groups. Eleven men, husbands of these women, and 23 individual women did not attend the group meetings but followed the same instructions given to the group. The first five groups met once a week in the morning except during the
holiday season for 12 to 18 months. The remaining two groups met for 3 to 6 months. The Kamas group met in the evening. The women weighed themselves at each meeting as soon as they arrived and recorded their weight on a graph (Figure 1). Every three months, measurements of bust, waist, and thighs, were taken and compared with previous measurements. A lesson or discussion on adequate nutrition, weight reduction problems, or methods of food preparation was held at each meeting. Low calorie foods often were prepared and recipes shared.

Exercise was a part of each meeting. There were several women who had joined the groups for the exercising because they were interested in a redistribution of fat pads more than of weight loss.

Each woman set her own goal for the weight she would like to be. The range of overweight was from 7 to 100 pounds. On this basis, a total of 2,113 pounds needed to be lost by the women in the seven groups.

Each woman was asked to obtain written permission from her doctor to join the group or to discuss with him her participation in it. Physical and health problems which were involved in addition to overweight and obesity were high blood pressure, diabetes mellitus, a tendency toward diabetes, multiple sclerosis, arthritis, hypothyroidism, colitis, and ulcers.

At the beginning of the therapy in 1958, a low calorie-high protein diet (planned around the Basic Four Food Plan) was used by the women on a calorie counting basis. Each
woman was asked to keep a dietary record for the first week. The forms and directions for keeping the records have been published (97). Their dietary records were discussed at the second meeting. A basic diet of 1200 calories, which had been planned so that it could be decreased to 1000 calories or increased to 1600 calories if needed was adapted for each woman to allow for individual likes and dislikes. The U. S. D. A. leaflet "Food for Fitness" (1) was used as a guide and a basic meal pattern that could be used by the whole family was stressed.

A few months later the Exchange Plan (56) was introduced to the women and incorporated into their weight reduction program. The Exchange Lists are presented in Table 5. A 1200 calorie reducing dietary pattern using the exchange lists was planned for each individual. An example with a suggested menu is shown in Table 1. Each woman was helped to adapt this low calorie diet in terms of total food exchanges for the day into a menu that came within the family dietary pattern.

In February 1964 a survey questionnaire (Figure 2) was sent to 59 of the women who had participated in the group therapy. The purpose of the survey was to measure the effectiveness of a weight reduction program after an interval of 4 years. Forty-four survey sheets, or 75 percent, were returned.

Utah State University campus group. A weight reduction group was organized on the Utah State University campus during October of 1963 and continued meeting until March 1, 1964.
Personal contacts and a notice in the local paper were used as means of obtaining members. The group as it was first contacted was a carry-over from a group that had been meeting weekly for two months. Five women re-registered and eight women and three young girls registered for the first time. A total of thirteen women and three teen-age girls enrolled. Each member was asked to fill in a fact sheet (Figure 3) about herself so that information could be obtained on her age, family, education, cultural and religious background. The members also were asked to keep a graphic record of their weight situation (Figure 1). Plans were to meet every Friday at 4:00 p.m., but by the middle of November, this schedule was changed to every other Friday.

One of the women was selected as chairman. She notified group members of meetings, of any changes in schedule, and assisted with the clerical work needed to record weights.

The meetings were divided as follows:

Weighing and recording weight 15 minutes
Lesson, discussion, or demonstration pertaining to weight reduction 30 minutes
Exercising 15 minutes

The members were asked to keep a dietary record for the first week and to recheck on their diet periodically. The Exchange Plan (Table 5) was used to develop a low-calorie dietary pattern for each individual as described for the Summit County group. Special help was given in meal planning for the entire family so that the meals would be adequate for
the needs of each member of the family as well as the dieter.

A study of the breakfasts of the group members was made. The test used to score these breakfasts is shown in Figure 4.
RESULTS AND DISCUSSION

Summit County groups

In the seven Summit County weight reduction groups a total of 154 women were enrolled over a period ranging from three months to approximately two years. One hundred and six of these women, or 69 percent, showed a total weight loss of 842 pounds; five women remained the same while four women gained weight. There were 39 women who came to the first meeting, and then dropped out of the program. Reasons which were given for dropping the weight reduction program were lack of time, too much socializing, illness, schedule of meeting at wrong hour, and pregnancy. One woman reported that her family problems were so intense at the time that she was not able to concentrate on losing weight. Four women moved away from the county. Most of the dropouts just failed to return to the second meeting. The results of the group therapy program are shown in Table 1.

The weight loss of the women was closely related to the number of meetings attended and the amount of weight that was to be lost. The women who had an excess weight of 5 to 15 pounds made consistent progress in weight reduction. When the weight excess was 15 pounds or above, the weight loss was a relatively few pounds and it fluctuated considerably. This was in agreement with reports from several research studies (46, 108).
Table 1. A summary of the results of group therapy in Summit County

<table>
<thead>
<tr>
<th>Community</th>
<th>No. enrolled</th>
<th>No. lost weight</th>
<th>Pounds lost</th>
<th>No. same weight</th>
<th>No. drop outs</th>
<th>No. who gained weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coalville I</td>
<td>20</td>
<td>14</td>
<td>126</td>
<td>1</td>
<td>5</td>
<td>-</td>
</tr>
<tr>
<td>Coalville II</td>
<td>13</td>
<td>11</td>
<td>102</td>
<td>1</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Henefer</td>
<td>28</td>
<td>2</td>
<td>129</td>
<td>1</td>
<td>7</td>
<td>-</td>
</tr>
<tr>
<td>Hoytsville</td>
<td>18</td>
<td>13</td>
<td>68</td>
<td>1</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>Wanship</td>
<td>20</td>
<td>17</td>
<td>133</td>
<td>-</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Park City</td>
<td>31</td>
<td>19</td>
<td>139</td>
<td>-</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>Kamas</td>
<td>24</td>
<td>12</td>
<td>45</td>
<td>1</td>
<td>11</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>154</td>
<td>106</td>
<td>842</td>
<td>5</td>
<td>39</td>
<td>4</td>
</tr>
</tbody>
</table>

Approximately 20 percent or 28 women reached the weight goal they had set for themselves. These were women who had from 5 to 10 pounds to lose. None of the women with larger amounts of weight to lose reached the goals set. The women reported that their husbands and other members of the family also were showing progress in weight reduction. The men lost from 10 to 20 pounds and several had changed some eating habits. One woman reported that her husband had quit "nibbling" on sweets and had lost eight pounds. A 12 year old girl, who was working along with her mother on weight reduction, lost 7 pounds.

The women were especially interested in the nutrition information given. They asked many questions on meal planning.
and were anxious to see that their families were fed adequate diets. In many cases, the class member was the only one who had a weight reduction problem. Meal planning, with at least one of the members, was done at each meeting. A check showed that poor eating habits and a lack of knowledge of basic nutrition were contributing factors to overweight. The lessons on nutrition and the meal planning done with the various members helped in establishing better family eating patterns. The homemakers reported that they were becoming more conscious of which foods to use in order to maintain an adequate diet. As they gained knowledge, they applied it in feeding their own families. Most of the women ate a skimpy breakfast or none at all and few drank milk at the beginning of the program. These were two of the early changes they made in their own eating habits.

The women found that they received additional nutrition information when the exchange plan was used. In this plan the common foods were divided into six groups or lists in which each food item in any one list contains approximately the same caloric value. Use of the exchange lists allowed one food to be substituted for another of the same caloric value so that the weight watcher was not restricted to one menu. Thus, serving portions were learned and calories did not have to be counted as such. Knowing the size of serving portion thus allowed the person to eat family meals and to eat away from home without changing the reducing regimen.

The majority of the women were active in church and club
work and this meant considerable entertaining and eating out. Much of the problem was late eating which usually added another meal to the day's caloric load. Discussions were held with the groups on some of the types of foods to select when eating out and types of party menus to plan. The women participated in preparing low-calorie food dishes to bring to the meetings and shared the recipes with others. These recipes, in addition to others available, were mimeographed into a booklet for use by those interested. Included were snack dishes, beverages, low-calorie desserts, and main dishes.

The women in the groups were congenial and interested in losing weight. They also had a sincere interest in each other and kept motivation high through personal and telephone contacts between meetings. There was a feeling of friendly competition within each group. As each group was fairly homogeneous, this was understandable.

At the end of the program, a poll of members indicated that in order for an individual to be successful in weight reduction it took good motivation, group action, and continuous contact.

The effectiveness of a weight reduction program. The survey, which measured the weight status and certain eating habits of the women 4 years after the weight reduction program, indicated that weight loss was not permanent for 29 women, or 66 percent of the members of the weight reduction groups. Twelve of the women (27 percent) reached the weight they were when they started in the class and seven of them (16 percent)
exceeded the beginning weight.

The summary of the weight changes from 1958-59 to 1964 are shown in Table 4. The one teen-ager in the group gained 23 pounds after having lost 10 in 1959. The mother of this girl was also in the original weight control group with an excess weight of 100 pounds, but whatever few pounds she had lost were quickly regained. The average weights for the other three age groups increased as the age increased. In the young women's group for 1964, four of the women had lost 45 pounds and 10 women had gained 134 pounds. In the middle age group nine women had lost 78 pounds and 15 had gained 134 pounds. One woman showed no change in weight. Three women in the older-middle age group gained 20 pounds and one lost 22 pounds.

The tabulation of breakfast habits (Table 2) was included here as this is the one meal that women frequently skip. When the weight reduction classes were started in 1958-59, the majority of women either ate no breakfast or a very skimpy one. Their comments on the survey showed that this is one place they had improved food habits. Thirty-six women now ate a balanced breakfast daily and eight women occasionally had a good breakfast.

The women were asked if the classes had had any effect on changing eating habits. Forty-one women answered "yes" and only three answered "no." Thirty-seven women reported that they were more conscious of nutrition in family meal planning; six that they were conscious of nutrition part of the time. The types of changes that were made in eating
Table 2. Summary of weights for 1958-59 and 1964 of women in weight control groups in Summit County

<table>
<thead>
<tr>
<th>Age group</th>
<th>No. in age group</th>
<th>1958-59 weight beginning</th>
<th>Weight a lbs.</th>
<th>1964 weight lbs.</th>
<th>No. who gained or lost weight b</th>
<th>No. eating breakfast in 1964</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lost lbs.</td>
<td>Gain lbs.</td>
</tr>
<tr>
<td>Teen age</td>
<td>1</td>
<td>172</td>
<td>-10</td>
<td>185</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Young women</td>
<td>14</td>
<td>141</td>
<td>-7</td>
<td>138</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>Middle age</td>
<td>25</td>
<td>163</td>
<td>-13</td>
<td>155</td>
<td>9</td>
<td>15</td>
</tr>
<tr>
<td>Older middle age</td>
<td>4</td>
<td>175</td>
<td>-9</td>
<td>166</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

a Weight lost during group therapy program.

b 1964 weight compared to final weight in group therapy program.
habits and meal planning as a result of the weight reduction therapy were given by the women as follows: better food habits were developed; less fats, more protein and more vegetables were used; between meal eating was eliminated; high calorie foods were avoided; and size of servings were decreased. Many of the women commented on the value of these weight control classes. They were a way of learning better nutrition. The mothers were especially interested in this phase. In fact one of the young mothers wrote "... when I was expecting my last two babies, the doctor was pleased to see I knew what foods to eat. Going to this class has really helped me." Another wrote "It was a very good class. I learned what kinds of foods to eat to maintain good health and to also keep my weight down."

The women reported that their families received many benefits from the class. Several women indicated that overweight husbands had carried on weight reduction with them. They had all benefited by more adequate meals, lower calorie meals which resulted in weight loss, and better balanced meals. The women felt that they had been able to use more vegetables too and that their families were more receptive to the vegetables.

The women used high protein foods in their meals with 95 percent of them having some form of protein in each of the three meals. The same high percentage of usage was reported for vitamin C in the diet. Milk content of the diet was reported as follows: 11 women had no milk; 16 had 1 cup;
nine, 2 cups; and eight, 3 cups daily.

The women in the groups continuously indicated that what they learned about adequate nutrition and better meal planning was of great value to them.

The women need re-educating in their eating patterns in order for weight reduction to be successful and lasting. The most difficult problems for these women were to change the eating patterns such as to decrease the high intake of sweets, desserts, and breads; to eliminate or reduce eating between meals; to use smaller serving sizes; and to refrain from sampling food while cooking.

The women indicated that the association of the group gave them strength to continue on the weight reduction program. Each member was encouraged and helped by the other members to keep on the regimen. Some who did not continue to lose more weight, indicated that they had learned to maintain their weight instead of regaining. For many people learning not to gain or regain weight would be just as important as learning to reduce.

**Utah State University campus group**

Sixty-four percent of the campus group lost 37 pounds or an average of 5 pounds over a 6 month period; two members (18 percent) gained 6 pounds; two members (18 percent) remained the same weight; and five women dropped out of the program, two due to pregnancy. As in the Summit County groups, weight loss was related to number of meetings attended. Table 3 shows a summary of the weight situation.
Table 3. Summary of weights of Utah State University campus group

<table>
<thead>
<tr>
<th>Number</th>
<th>Age</th>
<th>Beginning weight</th>
<th>Goal</th>
<th>Weight change</th>
<th>Meetings attended</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>16</td>
<td>172</td>
<td>130</td>
<td>-4</td>
<td>13</td>
</tr>
<tr>
<td>2</td>
<td>16</td>
<td>180</td>
<td>135-130</td>
<td>-6</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>27</td>
<td>146</td>
<td>125-130</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>32</td>
<td>144</td>
<td>120</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>33</td>
<td>173</td>
<td>160</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>33</td>
<td>160</td>
<td>145-150</td>
<td>-4</td>
<td>7</td>
</tr>
<tr>
<td>7</td>
<td>33</td>
<td>167</td>
<td>145</td>
<td>pregnant</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>35</td>
<td>151</td>
<td>115-120</td>
<td>-17</td>
<td>7</td>
</tr>
<tr>
<td>9</td>
<td>35</td>
<td>183</td>
<td>1 lb./wk.</td>
<td>-1</td>
<td>2</td>
</tr>
<tr>
<td>10</td>
<td>39</td>
<td>167</td>
<td>135</td>
<td>+3</td>
<td>10</td>
</tr>
<tr>
<td>11</td>
<td>42</td>
<td>213</td>
<td>125</td>
<td>pregnant</td>
<td>1</td>
</tr>
<tr>
<td>12</td>
<td>44</td>
<td>138</td>
<td>125</td>
<td>-1</td>
<td>2</td>
</tr>
</tbody>
</table>

Joined in January 1964

<table>
<thead>
<tr>
<th>Number</th>
<th>Age</th>
<th>Beginning weight</th>
<th>Goal</th>
<th>Weight change</th>
<th>Meetings attended</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>34</td>
<td>176</td>
<td>136</td>
<td>+1</td>
<td>4</td>
</tr>
<tr>
<td>14</td>
<td>21</td>
<td>136</td>
<td>115</td>
<td>-4</td>
<td>2</td>
</tr>
<tr>
<td>13</td>
<td>19</td>
<td>147</td>
<td>120</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>16</td>
<td>34</td>
<td>202</td>
<td>175</td>
<td>some</td>
<td>2</td>
</tr>
</tbody>
</table>
Change in eating patterns was reported by a few of the members. A 16 year old high school girl, who did not eat breakfast, has now added breakfast to her meal pattern. She ate lunch of a small salad or soup and a coke at a local cafe. She changed this pattern to eating a more substantial, nutritious lunch, including milk. The exercises, plus more control of eating habits, had decreased her bust, waist, and thigh measurements by 1 inch each.

One of the women had fluctuated in weight from 167 to 166 to 170 to 168 to 170. She attributed this fluctuation and also the lack of weight loss to the menopause. Her emotional problems also would be a contributing factor. They were not deep-seated problems but they were serious enough to her to cause anxiety and to decrease motivation. Although she did not accomplish any weight loss, she was successful in maintaining her weight with no additional gain which is usually a problem during menopause.

The members found the use of the exchange list was as successful as was reported by the Summit County members.

One of the biggest problems the members seemed to have was a "compulsory" type of between meal eating. A lesson was conducted on using and preparing low calorie-high protein snacks that were included as part of the day's total food intake. At following meetings other suitable snacks were planned or demonstrated. Examples of foods used were; venison jerky, vegetable snacks with and without cottage cheese dips, hard-cooked eggs, and fruits.
A check on breakfasts showed that the majority of the class members would either miss breakfast or eat a very skimpy one. A special project on "better breakfasts" was started. The members were given a test to score their breakfasts (Figure 4). Three of the members scored zero while the rest scored from 4 to 7 points. The test was followed by a discussion on the importance of an adequate breakfast.

A basic breakfast pattern was set up and several variations were developed by the group according to each member's family eating habits and the foods available in the home. A two page mimeograph sheet on "Eat a Good Breakfast for Good Weight Control" was prepared, used as a basis for the discussion, and then given to the members for reference (See Appendix, page 86 of this report).

One meeting was devoted to a lesson on the size of a serving to help in judging serving portions by size. The members participated and measured or weighed portions for one serving of each food in three menus and of certain other foods as listed in Table 4. The menus were served on various size plates to show that use of small plates has a good psychological effect because it looked as if more food was served. The women scored this lesson as the one contributing the most information.

Ideas on cooking and serving low-calorie vegetables so that they had eye-appeal and were flavorful were discussed. The use of seasonings and herbs that enhanced flavor but did not increase calories was stressed. Thus more variety was
Table 4. The menus and foods used to indicate serving portions

<table>
<thead>
<tr>
<th>Menu No.</th>
<th>Menu Description</th>
<th>Serving Portion</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Menu No. 1</td>
<td>Roast venison, Green beans, Medium baked potato, Garnish</td>
<td>4 ounces, 1/2-1 cup</td>
</tr>
<tr>
<td>B. Menu No. 2</td>
<td>Roast venison, Carrots, Small baked potato, Garnish</td>
<td>4 ounces, 1/2 cup</td>
</tr>
<tr>
<td>C. Menu No. 3</td>
<td>Hamburger pattie, Peas, Mashed potatoes, Garnish</td>
<td>1/2 cup, 1/2 cup</td>
</tr>
<tr>
<td>D. Salads</td>
<td>a. Lettuce leaf, Pineapple slice, 1/2 cup cottage cheese</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. Lettuce leaf, Pineapple slice, 1/4 cup cottage cheese</td>
<td></td>
</tr>
<tr>
<td>E. Fruits</td>
<td>Peaches, Raspberries&lt;sup&gt;a&lt;/sup&gt;, Apricots&lt;sup&gt;a&lt;/sup&gt;, Low-calorie fruit gelatin with fruits</td>
<td>1 medium, 1 cup, 2 medium, 1 cup</td>
</tr>
<tr>
<td></td>
<td>Equals 1 exchange</td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup>No juice or water packed.
possible in planning menus. A few recipes were mimeographed and given to the members to try at home.
SUMMARY

A review of the literature in professional and scientific magazines and authentic books on weight reduction was made. A study was made of the results during group therapy in reducing weight in 1958-59 and of the weight status and certain eating habits of the women 4 years later. Summit County groups included 115 women. A weight reduction program with 16 women was conducted at Utah State University from November, 1963 to March, 1964.

From the many scientific articles published on the various facets of weight control, the following summary statements can be made.

Studies showed that overweight and obesity affected up to 40 percent of the adult population and 10 percent of the children and adolescents.

The essential cause of overweight was overeating, that is, food intake exceeded energy output. Often the cause of overeating was a symptom of some underlying difficulty which was psychological and emotional. Childhood obesity, which carries over into later life, may be caused by the eating patterns set in the home. If one parent was obese, 40 percent of the children were obese; if both parents were obese, 80 percent of the children were obese. Very few cases of overweight and obesity was caused by endocrine factors.

For clinical purposes the best method for judging
obesity was by simple inspection, supplemented by the skinfold test.

Interest in and concern over obesity is due to the social and cultural aspects involved, but more especially to the health and physical problems which are often increased or precipitated by an overweight condition. Obese individuals generally have an increased incidence of diabetes mellitus, atherosclerosis, hypertension, cerebral strokes, kidney and liver diseases, and arthritis. Also the life-span is shortened and they are poor risks for surgery.

Many methods and many diets to reduce weight have been presented to the public. Food faddists and quacks have played up the emotional value of foods to overweight and obese individuals.

The key to successful weight reduction followed by lifetime weight control is medically supervised dieting, exercising, and psychological help where needed. Eating habits must be retrained and new eating habits established.

Of the Summit County women, 69 percent showed a total weight loss of 842 pounds (8 pounds per person over a 12 to 18 month period). Weight loss was related to motivation, reduction needed, and number of classes attended. A survey of 44 women taken 4 years later showed that 23 percent of the women regained part or all of the weight they had lost and then maintained it while 45 percent of the women lost additional weight. The women reported that the group therapy method was effective in preventing excessive gains and much nutrition
information was learned that was helpful to them in family meal planning.

Weight loss in the Utah State University campus group was 37 pounds (5 pounds per person over a 5 month period) for 64 percent of the women. Eighteen percent of the women were able to maintain their weight and not gain which was considered a good measure of success for them. These women were middle aged.
RECOMMENDATIONS

The following recommendations can be made for a successful weight control program.

1. Consult a medical doctor to determine whether or not weight reduction is recommended from a health standpoint.
2. Decide with the physician and/or nutritionists the total reduction needed. The rate should be no more than 1 to 2 pounds per week.
3. A strong motivation or goal is necessary for consistent weight loss.
4. Plan a good basic, nutritionally adequate diet (high protein, moderate fat, low calories) that reflects the individual's likes and dislikes. Use of a diet based on the exchange plan is recommended.
5. Skip no meals. Eating each day at the same time makes it easier to stay on a reducing diet.
6. Eat food slowly.
7. Increase taste enjoyment and eye-appeal with the use of herbs and flavorings which do not add calories.
8. Include moderate, regular exercise.
9. After weight is reduced, maintain the new weight by balancing caloric intake with energy output.
10. Be satisfied with figure. Do not over-reduce.

A renewed effort needs to be put forth to educate the public to the necessity for prevention of overweight and to help them in diet therapy if needed.
LITERATURE CITED


<table>
<thead>
<tr>
<th>WEIGHT (Assign two lines per pound)</th>
</tr>
</thead>
</table>

DAYS (Each line one day)

Figure 1. Weight reduction chart
Dear Friend,

Will you lend a helping hand so that I can get some information for the research work on my master's thesis?

You were a member of a weight control group during 1958-60. I need to know what the situation is now. Your name won't be used, but the information you give will be added to what I have. So, will you please answer the following questions?

1. Did you change any of your eating habits? Yes____ No____
   Explain: ____________________________________________________________

2. Have you controlled your eating habits since our group work?
   All the time   About half of the time   A little   None

3. Are you more conscious nutritionally of what you eat?
   Yes     Partly     No

4. How did your dieting influence your family members?____

5. Do you eat these meals every day?

<table>
<thead>
<tr>
<th></th>
<th>Always</th>
<th>Part of the time</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakfast</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lunch</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dinner</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6. How much milk do you drink each day?

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0 cup</td>
<td>1 cup</td>
<td>2 cups</td>
<td>3 cups</td>
</tr>
</tbody>
</table>

Figure 2. Final questionnaire used in Summit County
7. Do you have some protein at each meal?  

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakfast</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lunch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dinner</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8. Do you have a vitamin C rich food each day?  Yes___ No___

9. What is your weight at present time?  _____ pounds

10. What were some of the hardest things you had to do to control your weight?

11. Have you kept on with the exercising?  

   Yes____  No____  Partly____

12. I would appreciate your telling how good you think this type of weight control class was?

Thank you very much for your help. I really appreciate it.

Naomi

Your Name

Figure 2. Continued.
Name ___________________________ Date ____________________________
Last ___________ first __________ middle __________
Address ___________________________ Size of town ____________________________

Husband's occupation ___________ Education ___________ Religion ___________
Your age _____ Age of children: boys ___________ Girls ___________
Place of birth ___________________________ Residence in early life ____________________________
High School attended ___________________________ Graduate: Yes ____ No ____
College attended ___________________________ Graduate: Yes ____ No ____
Religious affiliation or preference ____________________________
Recreational Interests ____________________________
Health: Excellent ______ Good _____ Fair ______ Poor ______
Do you have any specific health problems? ____________________________
If so, please specify ____________________________
Are you under a Doctor's care? Yes ______ No ______
When did you have your last physical check-up ____________________________
Current employment ___________________________ Hours per week ____________________________
What church or civic assignments do you have? ____________________________

How many hours per week do you spend at these? ____________________________

Weight ______
Height ______
Goal ______

Measurements:
Bust ______
Waist ______
Hips ______

Figure 3. Fact sheet
Name ________________________________

SCORE YOUR BREAKFAST

<table>
<thead>
<tr>
<th>Food</th>
<th>Points</th>
<th>Your Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citrus fruit or citrus juice</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Any other fruit</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Milk, 1 cup</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Cocoa, 1 cup</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Egg or a serving of any other protein food</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Cereal with milk</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Bread or any other baked product or potatoes</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Coffee or tea</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

(Two eggs, or eggs and bacon still count as only 2 points)

A SCORE OF 5 OR 6 INDICATES A GOOD BREAKFAST

Your score ____________________

Figure 4. Test used to score the nutritional value of a breakfast
Table 5. Food lists used in exchange plan

<table>
<thead>
<tr>
<th>Food exchanges</th>
<th>Amount to use</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Milk exchange</strong></td>
<td></td>
</tr>
<tr>
<td>One exchange of milk contains 12 grams carbohydrates, 8 grams protein, 10 grams fat, and 170 calories.</td>
<td></td>
</tr>
<tr>
<td>Whole milk (plain or homogenized)</td>
<td>1 cup</td>
</tr>
<tr>
<td>Skim milk(^a)</td>
<td>1 cup</td>
</tr>
<tr>
<td>Evaporated milk</td>
<td>1/2 cup</td>
</tr>
<tr>
<td>Powdered whole milk</td>
<td>1/4 cup</td>
</tr>
<tr>
<td>Powdered skim milk (non-fat dried milk)</td>
<td>1/4 cup</td>
</tr>
<tr>
<td>Buttermilk (made from whole milk)</td>
<td>1 cup</td>
</tr>
<tr>
<td>Buttermilk (made from skim milk(^a))</td>
<td>1 cup</td>
</tr>
</tbody>
</table>

\(^a\)Skim milk and buttermilk made from skim milk have the same food values as whole milk except they contain less fat. Add 2 fat exchanges to your meal when you use 1 cup of skim milk or buttermilk made from skim milk.

| **2. Vegetable exchange A**                          |               |
| Contain little carbohydrate, protein or calories.   |               |
| You may eat as much of these vegetables raw as you wish, except tomatoes.\(^b\) If these vegetables are cooked, you can use as much as 1 cup at a time. When you want more, you can use another cup of these in exchange for a list "B" vegetable. |               |
| Asparagus                                           |               |
| Broccoli\(^c\)                                      |               |
| Brussel sprouts                                     |               |
| Cabbage                                             |               |
| Cauliflower                                         |               |
| Celery                                              |               |
| Chicory\(^c\)                                       |               |
| Cucumbers                                           |               |
| Escarole\(^c\)                                      |               |
| Eggplant                                            |               |
| Greens\(^c\)                                        |               |
| Beet greens                                         |               |
| Chard                                               |               |
| Collard                                             |               |
| Dandelion                                           |               |
| Greens, continued                                   |               |
| Kale                                                |               |
| Mustard                                             |               |
| Spinach                                             |               |
| Turnip greens                                       |               |
| Lettuce                                             |               |
| Mushrooms                                           |               |
| Okra                                                |               |
| Pepper\(^c\)                                        |               |
| Radishes                                            |               |
| Sauerkraut                                          |               |
| String beans, young                                 |               |
| Summer squash                                       |               |
| Tomatoes\(^c\)                                      |               |
| Watercress\(^c\)                                    |               |

\(^b\)Limit tomatoes to 1 tomato or 1/2 cup tomato juice at a meal.

\(^c\)These vegetables contain a lot of vitamin A.
Table 5. Continued

<table>
<thead>
<tr>
<th>Exchange</th>
<th>Amount to use</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3. Vegetable exchange B</strong></td>
<td></td>
</tr>
<tr>
<td>Contains 7 grams carbohydrates, 2 grams protein, and 35 calories. You may use these vegetables raw or cooked. One-half cup equals one exchange.</td>
<td></td>
</tr>
<tr>
<td>Beets</td>
<td></td>
</tr>
<tr>
<td>Carrots d</td>
<td></td>
</tr>
<tr>
<td>Onions</td>
<td></td>
</tr>
<tr>
<td>Peas, green</td>
<td></td>
</tr>
<tr>
<td>Pumpkin</td>
<td></td>
</tr>
<tr>
<td>Rutabagas</td>
<td></td>
</tr>
<tr>
<td>Squash, winter d</td>
<td></td>
</tr>
<tr>
<td>Turnips</td>
<td></td>
</tr>
<tr>
<td>dThese vegetables contain a lot of vitamin A.</td>
<td></td>
</tr>
<tr>
<td><strong>4. Fruit exchange</strong></td>
<td></td>
</tr>
<tr>
<td>Apple (2&quot; diameter)</td>
<td>1 small</td>
</tr>
<tr>
<td>Applesauce</td>
<td>1/2 cup</td>
</tr>
<tr>
<td>Apricots, fresh</td>
<td>1 medium</td>
</tr>
<tr>
<td>Apricots, dried</td>
<td>4 halves</td>
</tr>
<tr>
<td>Banana</td>
<td>1/2 small</td>
</tr>
<tr>
<td>Blackberries</td>
<td>1 cup</td>
</tr>
<tr>
<td>Raspberries</td>
<td>1 cup</td>
</tr>
<tr>
<td>Strawberries e</td>
<td>1 cup</td>
</tr>
<tr>
<td>Blueberries</td>
<td>1 cup</td>
</tr>
<tr>
<td>Cantaloupe (6&quot; diameter)e</td>
<td>1/4</td>
</tr>
<tr>
<td>Cherries</td>
<td>10 large</td>
</tr>
<tr>
<td>Dates</td>
<td>2</td>
</tr>
<tr>
<td>Figs, fresh</td>
<td>2 large</td>
</tr>
<tr>
<td>Figs, dried</td>
<td>1 small</td>
</tr>
<tr>
<td>Grapefruit e</td>
<td>1/2 small</td>
</tr>
<tr>
<td>Grapefruit juice e</td>
<td>1/2 cup</td>
</tr>
<tr>
<td>Grapes</td>
<td>12</td>
</tr>
<tr>
<td>Grape juice</td>
<td>1/4 cup</td>
</tr>
<tr>
<td>Honeydew melon</td>
<td>1/8 medium</td>
</tr>
<tr>
<td>Mango</td>
<td>1/4 small</td>
</tr>
<tr>
<td>Orange e</td>
<td>1 small</td>
</tr>
<tr>
<td>Orange juice e</td>
<td>1/2 cup</td>
</tr>
<tr>
<td>Papaya</td>
<td>1/3 medium</td>
</tr>
<tr>
<td>Peach</td>
<td>1 medium</td>
</tr>
<tr>
<td>Pear</td>
<td>1 small</td>
</tr>
<tr>
<td>Pineapple</td>
<td>1/2 cup</td>
</tr>
<tr>
<td>Pineapple juice</td>
<td>1/3 cup</td>
</tr>
<tr>
<td>Plums</td>
<td>2 medium</td>
</tr>
<tr>
<td>Prunes, dried</td>
<td>2 medium</td>
</tr>
<tr>
<td>Raisins</td>
<td>2 tbs.</td>
</tr>
<tr>
<td>Tangerine e</td>
<td>1 large</td>
</tr>
<tr>
<td>Watermelon</td>
<td>1 cup</td>
</tr>
<tr>
<td>eThese fruits are rich sources of vitamin C. Try to use 1 of them each day.</td>
<td></td>
</tr>
</tbody>
</table>
### Table 5. Continued

<table>
<thead>
<tr>
<th>Exchange</th>
<th>Amount to use</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>5. Bread exchange</strong></td>
<td></td>
</tr>
<tr>
<td>Bread</td>
<td>1 slice</td>
</tr>
<tr>
<td>Biscuit, roll (2&quot; diameter)</td>
<td>1</td>
</tr>
<tr>
<td>Muffin (2&quot; diameter)</td>
<td>1</td>
</tr>
<tr>
<td>Cornbread (1 1/2 inch cube)</td>
<td>1</td>
</tr>
<tr>
<td>Cereals</td>
<td></td>
</tr>
<tr>
<td>Cooked</td>
<td>1/2 cup</td>
</tr>
<tr>
<td>Dry, flake and puff</td>
<td>3/4 cup</td>
</tr>
<tr>
<td>Rice, grits, cooked</td>
<td>1/2 cup</td>
</tr>
<tr>
<td>Spaghetti, noodles, cooked</td>
<td>1/2 cup</td>
</tr>
<tr>
<td>Macaroni</td>
<td>1/2 cup</td>
</tr>
<tr>
<td>Crackers</td>
<td></td>
</tr>
<tr>
<td>Graham (2 1/2 inch sq.)</td>
<td>2</td>
</tr>
<tr>
<td>Oyster (1/2 cup)</td>
<td>20</td>
</tr>
<tr>
<td>Saltines (2&quot; sq.)</td>
<td>5</td>
</tr>
<tr>
<td>Soda (2 1/2 inch sq.)</td>
<td>3</td>
</tr>
<tr>
<td>Round, thin (1 1/3&quot;)</td>
<td>6</td>
</tr>
<tr>
<td>Flour</td>
<td>2 1/2 tbs.</td>
</tr>
<tr>
<td>Vegetables</td>
<td></td>
</tr>
<tr>
<td>Beans and peas, dried, cooked</td>
<td>1/2 cup</td>
</tr>
<tr>
<td>Baked beans, no pork</td>
<td>1/4 cup</td>
</tr>
<tr>
<td>Corn</td>
<td>1/3 cup</td>
</tr>
<tr>
<td>Popcorn</td>
<td>1 cup</td>
</tr>
<tr>
<td>Parsnips</td>
<td>2/3 cup</td>
</tr>
<tr>
<td>Potatoes</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>1 small</td>
</tr>
<tr>
<td>White, mashed</td>
<td>1/2 cup</td>
</tr>
<tr>
<td>Sweet or yams</td>
<td>1/4 cup</td>
</tr>
<tr>
<td>Sponge cake, plain</td>
<td></td>
</tr>
<tr>
<td>(1 1/2 inch cube)</td>
<td>1</td>
</tr>
<tr>
<td>Ice cream (omit two fat exchanges)</td>
<td>1/2 cup</td>
</tr>
<tr>
<td><strong>6. Meat exchange</strong></td>
<td>1 meat exchange</td>
</tr>
<tr>
<td>One meat exchange contains 7 grams protein, 5 grams fat, and 75 calories.</td>
<td></td>
</tr>
<tr>
<td>Meat and poultry (medium fat)</td>
<td>1 ounce</td>
</tr>
<tr>
<td>Beef, lamb, pork, liver, chicken</td>
<td></td>
</tr>
<tr>
<td>Cold cuts (4 1/2&quot; x 1/8&quot;)</td>
<td>1 slice</td>
</tr>
<tr>
<td>Salami, minced ham, bologna, liverwurst, luncheon loaf</td>
<td></td>
</tr>
<tr>
<td>Frankfurter (8-9 per lb.)</td>
<td>1</td>
</tr>
<tr>
<td>Egg</td>
<td>1</td>
</tr>
<tr>
<td>Peanut butter</td>
<td>2 tbs.</td>
</tr>
<tr>
<td>Fish</td>
<td></td>
</tr>
<tr>
<td>Haddock</td>
<td>1 ounce</td>
</tr>
<tr>
<td>Salmon, tuna, crab, lobster</td>
<td>1/4 cup</td>
</tr>
<tr>
<td>Shrimp, clams, oysters</td>
<td>5 small</td>
</tr>
<tr>
<td>sardines</td>
<td>3 medium</td>
</tr>
</tbody>
</table>
### Exchange 

<table>
<thead>
<tr>
<th>Meat exchange continued</th>
<th>Amount to use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cheese</td>
<td></td>
</tr>
<tr>
<td>Cheddar type</td>
<td>1 ounce</td>
</tr>
<tr>
<td>Cottage</td>
<td>1/4 cup</td>
</tr>
</tbody>
</table>

Limit peanut butter to one exchange a day unless the carbohydrates in it is allowed for in your meal plan.

### 7. Fat exchange

One fat exchange contains 5 grams of fat and 45 calories.

<table>
<thead>
<tr>
<th>Exchange</th>
<th>Amount to use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Butter or margarine</td>
<td>1 teaspoon</td>
</tr>
<tr>
<td>Bacon, crisp</td>
<td>1 slice</td>
</tr>
<tr>
<td>Cream, light</td>
<td>2 tablespoons</td>
</tr>
<tr>
<td>Cream, heavy</td>
<td>1 tablespoon</td>
</tr>
<tr>
<td>Cream cheese</td>
<td>1 tablespoon</td>
</tr>
<tr>
<td>Avocado (4&quot; diameter)</td>
<td>1/8</td>
</tr>
<tr>
<td>French dressing</td>
<td>1 tablespoon</td>
</tr>
<tr>
<td>Mayonnaise</td>
<td>1 teaspoon</td>
</tr>
<tr>
<td>Oil or cooking fat</td>
<td>6 small</td>
</tr>
<tr>
<td>Nuts</td>
<td>5 small</td>
</tr>
<tr>
<td>Olives</td>
<td></td>
</tr>
</tbody>
</table>

### 8. How to use exchange lists

A. How to use the exchange lists in a 1200 calorie reducing diet

<table>
<thead>
<tr>
<th>Exchanges allowed per meal</th>
<th>Breakfast</th>
<th>Lunch</th>
<th>Dinner</th>
<th>Snack</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk exchange (skim)</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Veg. exchange A</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Veg. exchange B</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Fruit exchange</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Bread exchange</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>Meat exchange</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>-</td>
<td>6</td>
</tr>
<tr>
<td>Fat exchange</td>
<td>1</td>
<td>1</td>
<td>1/2</td>
<td>1</td>
<td>4</td>
</tr>
</tbody>
</table>
Table 5. Continued

<table>
<thead>
<tr>
<th>Exchange</th>
<th>Amount to use</th>
</tr>
</thead>
</table>

B. A suggested menu

**Breakfast**
- 1/4 canteloupe or
- 1/2 grapefruit
- 1 soft cooked egg
- 1 slice toast
- 1 tsp. butter
- 3/4 c. skim milk
Tea or coffee

**Lunch**
- 2 1/2 oz. sliced cold ham
- 1/2 c. cooked green beans
- Carrots and celery sticks
- 1 small pear
- 1 slice bread
- 1 1/2 tsp. butter
- 3/4 c. skim milk

**Dinner**
**Broth**
- 3 oz. lean meat
- 1 med. potato
- 1 tsp. butter
- 1/2 c. beets
- 1 med. peach
- 1/2 c. skim milk
Eat a good breakfast for good weight control
(U.S.U. Food and Nutrition Department)

Skimp and inadequate breakfasts may be one reason why we have so many overweight adults in these United States.

Breakfast is your most important meal. An adequate breakfast will add fewer pounds than will a breakfast of coffee and sweet rolls. An adequate breakfast will allow you to work through the morning without the feeling of hunger and energy let-down.

A good breakfast is one which furnishes from one-fourth to one-third of the day's protein and calories. Studies have shown that a well-balanced breakfast is the foundation for the rest of the day's diet and that those who have such a meal feel better, work better, and have more vitality. It has also been shown that if the breakfast is poor it is difficult to make up for the deficiency in the other meals.

Breakfast patterns.

A
Fruit or juice (preferably ascorbic acid-rich)
Egg or other protein rich food
Bread (enriched or whole wheat)
with butter or substitute
Milk

B
Fruit or juice
Cereal with milk
Milk (preferably skim)

C
Sweet roll—coffee

Breakfasts A and B will give the same calories (or less) as breakfast C will. A and B = 12 to 18 grams of protein, C = 3 grams of protein.

For successful weight control, breakfast A is recommended,
but B is a good substitute. The larger breakfast will carry you over with no need for a mid-morning snack and with less desire to eat too much lunch or dinner.

The protein supply makes the difference. Protein seems to control the hunger signal. The higher your protein intake, the longer you can keep your hunger signal turned off.

Part of the food you eat turns to sugar. The amount of sugar in your blood, fluctuates abruptly after you eat. This controls your appetite. When the sugar in your blood reaches a certain point, your hunger signal turns off. This chart shows how it works.

---Blood-sugar level after eating breakfast which is high in protein.

---Blood-sugar level after eating breakfast which is high in carbohydrates and low in proteins.

The breakfast of sweet rolls and coffee with cream and sugar is mostly carbohydrates which raise the blood sugar level quickly. They are quick energy foods, but their energy is soon used up and your hunger signal turns on again.

By 10:00 o'clock you are hungry again, so you eat a mid-morning snack of: Rolls, Cake, Doughnuts, Candy or Cookies—with or without coffee. This adds as many more calories as you had for breakfast and only three or four grams of protein to tide you over until lunch time. This is still low on
protein with a much higher intake of calories. During the morning you will have eaten far more calories than if you had eaten the basic breakfast with 18 grams of protein.

Eggs, meat, and milk are all high in proteins. Milk improves the protein quality in your cereals.

Proteins also raise the blood sugar level but they hold it above the hunger line far longer. Fats slow down the rate at which you digest carbohydrates and proteins, so they help keep a more constant blood-sugar level.

If you haven't learned to start your day with a good breakfast, take your fruit juice as soon as you are out of bed. This will help get your appetite ready for the rest of your breakfast later. If you don't have time to eat breakfast, drink the milk as you feed the family, then eat the rest of your breakfast after the family leaves for school or work. Or the milk in either breakfast A or B can be saved for a mid-morning snack.