

## UNIT NO. 2

**FAD DIETS, FATS & WEIGHT MANAGEMENT**

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**ABSTRACT**

People have always been obsessed with dieting. They willingly try the latest fad diets that defy logic, basic biochemistry, and even appetite appeal. Fad diets are popular because they promise quick results, are relatively easy to implement, and claim remarkable improvements in how their followers will look or feel. Unfortunately, the one thing most fad diets have in common is that they seldom promote sound weight loss. This unit looks at the common features of fad diets and the recommendations for a sound diet for weight loss.

It can be confusing to navigate the way around so many different types of fats and the myths surrounding them. A cardio protective diet is essential to optimise healthy cholesterol levels. The second part of the unit discusses the impact of fats on weight management and blood lipoprotein profile.

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**INTRODUCTION**

It all begins the same way. The overweight looks into the mirror, gasp in horror and then frantically embark on the trendiest diet – either on the shelves or off the internet – in hope to lose all those extra kilos. But do these fad diets really work? And if they do, are they safe?

This unit's focus is on evaluating the safety and efficacy of common fad diets in promoting weight loss. The second part looks at fats and their determinants on blood lipid profile as well as the popular fads about fats.

**OBJECTIVES**

At the end of the session, the participant should be able:

- To recognize the common features of fad diets
- To identify the categories of popular fad diets
- To explain the dietary concepts of caloric balance and energy density for weight loss
- To recommend a balanced diet for weight management
- To understand the different types of fats and list their food sources
- To identify the nutritional determinants on lipoprotein profile
- To recommend a cardio protective diet for cholesterol optimization
- To answer basic facts and myths about dietary fats

**DEBUNKING FAD DIETS**

The quick definition of a fad diet is a weight loss plan that promises dramatic results over a short term period.

The common features of fad diets can be summarized as follows:

- Promise rapid weight loss
- Restrict one food item or food group
- Promote intake of a particular food item or food group
- Cure numerous health problems
- Simplistic theories presented in a scientific sounding way
- Use gimmicks to twist science
- Not supported by scientific evidence or evidence at best
- Usually has many personal anecdotes and testimonials
- Authors lack credentials
- Lack of acknowledgement of physical activity needs
- Made popular by media
- Endorsed by celebrities

The language used in such publications often takes the blame away from the reader. For instance, Atkins wrote in his books “You are a normal person who’s had...” Powerful language such as “Health is your birthright...” is also used in fad diet books to persuade readers into believing their theories. Authors of many fad diet books like to use difficult scientific terms to further confuse or mislead readers into believing that these diets are reliable and evidently sound.

As fad diets typically involve a restricted eating plan, dieters usually do not receive enough nutrition to sustain their bodies. Fad diets may weed out entire food groups and increase risk of nutritional deficiencies. For instance, a low or no carbohydrate diet reduces intake of B group vitamins and fibre; a no red meat diet compromises intake of important nutrients such as iron, zinc and vitamin B12; while a no dairy diet may reduce calcium and riboflavin intake significantly, just to name a few. The writers of such popular diets tend to play on allergies and food intolerances, resulting in unnecessary restriction.

Those on fad diets might lose weight quickly as a result of calorie restriction, but in many cases, little actual fat is lost. During the diet, the body becomes lethargic and energy levels stay low. Dieters may also regain the weight quickly after discontinuing the regime. Fad diets being monotonous, boring and highly specific can be often hard to follow. Preparation and shopping needs devotion, otherwise there may be a need to buy their pre-prepared bars, shakes or meals.

**TYPES OF FAD DIETS**

This following section will highlight some of the common fad diets.

A plethora of diets, with varying proportions of carbohydrate, protein and fats, has been suggested in many weight loss regimes<sup>1</sup>. They are mostly categorized into the following types:

- Low carbohydrates, High fat
- High carbohydrates, Low fat
- Moderate fat, balanced calorie reduction

An average adult with an office-based job typically need about 2000 to 2500 calories, depending on the gender<sup>2</sup>. Fad diets work simply because they restrict calorie intake. Table 1 shows some of the recommended meal plans of popular fad diets and their calorie intake. Anyone following any of these meal plans will surely lose weight as they are consuming a hypo caloric intake of between 1200 to 1600 calories. This concept of calorie balance is the fundamental principle of any weight loss programmes.

### **Low carbohydrates, High fat diets**

Low carbohydrate, high protein diets are one of the most popular alternative weight loss approaches. These diets derive a large proportion of energy intake from protein and fat and there is a concern for the potentially detrimental impact of these diets on blood lipid levels and on cardiovascular risk<sup>3</sup>. Popular diets of this category include Atkins and Sugar Busters.

A meta-analysis of 5 randomized controlled trials of low carbohydrate diets vs. low fat diets showed that individuals assigned to the former had lost more weight at 6 months and the difference was no longer obvious after 12 months<sup>3</sup>. There were no differences in blood pressure. Triglycerides and high-density lipoprotein cholesterol values changed more favourably while unfavourable changes in total cholesterol and low-density lipoprotein cholesterol values were observed in comparison with low fat diets.

A systematic review on the efficacy and safety of low carbohydrate diets reported insufficient evidence to make recommendations for or against the use of low carbohydrate diets<sup>4</sup>. Among the published studies, participants' weight loss while using low carbohydrate diets was principally associated with decreased caloric intake and increased diet duration but not with reduced carbohydrate content.

The disadvantages of high protein, high fat and low carbohydrate diets include<sup>3,4</sup>:

- Increased fat intake and consequently cholesterol levels as diet is usually based on large amounts of animal foods
- High cost if protein supplements are used or large amounts of animal foods are consumed
- Accelerate progression of pre-existing kidney disease
- Increased urinary calcium excretion
- May increase fluid requirements
- May displace other valuable foods (e.g. fruits & vegetables) or other important nutrients such as carbohydrate & fibre from diet

### **High carbohydrates, Low fat diets**

Traditionally, low fat diets have been the cornerstone of many weight loss diets. Low fat diets contain a high proportion of complex carbohydrates, fruits, and vegetables, which are naturally high in fibre and low in caloric density. This promotes greater satiety, resulting in weight loss<sup>1</sup>. Most low fat diets recommend up to no more than 30% of energy from fat, with extreme low fat diets such as the Ornish diet, promoting no more than 10% of energy from fat<sup>5,6</sup>.

The cons of very low fat diets include<sup>1</sup>:

- Deprive body of sources of essential fatty acids such as omega-3
- Deprive body of fat-soluble vitamins A, D, E and K
- May be unpalatable and unsustainable in the long term

### **Moderate fat, balanced calorie reduction diets**

Most dietary guidelines of major professional bodies recommend balanced calorie reduction diets that are moderately restricted in total fat, carbohydrates and protein. These diets result in loss of body weight and body fat, as overall caloric intake is reduced<sup>1</sup>.

This category of diets includes commercial programmes such as Weight Watchers and The LEARN (Lifestyle, Exercise, Attitudes, Relationships, Nutrition) Program for Weight Management. The similarity of these programmes includes the use of behaviour change through support groups and self-monitoring. There is also a strong emphasis on the inclusion of physical activity to achieve weight goals and maintenance<sup>6</sup>.

### **WHICH DIET WILL KEEP THE WEIGHT OFF?**

There have mixed results when comparing the effectiveness of popular diets such as Atkins, Zone, Weight Watchers and Ornish. All 4 diets resulted in modest statistically significant weight loss at 1 year, with no statistically significant difference between diets<sup>5</sup>. Another randomized trial comparing the Atkins Zone, Ornish and LEARN diets for change in weight among overweight premenopausal women showed greater weight loss in the Atkins group compared with the other diet groups at 12 months and the mean 12-month weight loss was only significant between the Atkins and Zone diets<sup>6</sup>.

There seems to be a consistent suggestion that diets containing different proportions of the major macronutrients have all been shown to reduce body weight. Increased adherence was associated with greater weight loss, rather than the macronutrient content per se<sup>5,6</sup>. This could not better suggest that one ought to get back to basics while achieving weight loss with a suitable diet plan. So what works best?

Obesity guidelines suggest a 500 to 1000 calories reduction per day produces the recommended 0.5 to 1 kg weight loss per week<sup>1</sup>. Thus, the most important dietary concept of weight loss

and maintenance is a decrease in calorie intake.

The next concept for successful weight loss is that of energy density which refers to the amount of energy in a given weight of food. Studies that have systematically examined the effects of energy density of the diet have shown that it directly influences energy intake, an effect that is independent of the macronutrient composition of food<sup>7</sup>. For foods that are low in energy density, such as fruits and vegetables, satisfying portions can be encouraged, because they produce fullness while adding little energy. Contrary to standard advice to eat small portions to lose weight, advice to eat satisfying portions of low energy dense foods was a more successful strategy to weight loss. The emphasis should be on the types of food that can be eaten in satisfying portions instead of on restrictive messages that advocate reducing the portions of all foods.

Most of the fad diets mentioned in the previous section

consist of foods mainly from the Western culture. Therefore, applying these diet plans in our local multicultural food fare poses another dimension of challenge to dieters. It may be difficult or almost impossible to sustain a high fat, low carbohydrate diet or a low fat, high carbohydrate diet in the long term.

To achieve long term and sustainable weight reduction, one should follow a:

- Calorie reduced meal plan with
  - Moderate carbohydrate intake, rich in complex starches, fruits and vegetables
  - Moderately restricted total fat intake
  - Moderate protein intake
- Low energy density foods in satisfying portions
- Culturally adapted meal plan for palatability and sustainability

**Table 1: Comparison of Nutrient and Caloric Profiles of Popular Fad Diets**

	<b>Atkins</b>	<b>Zone</b>	<b>Ornish</b>
Macronutrient composition	<ul style="list-style-type: none"> <li>• &lt;20g/d of CHO for induction (2-3 months)</li> <li>• &lt;50g/d of CHO for “ongoing weight loss” phase</li> <li>• 55 to 65% Fat</li> <li>• 25 to 30% Protein</li> </ul>	<ul style="list-style-type: none"> <li>• 40% CHO</li> <li>• 30% Fat</li> <li>• 30% Protein</li> </ul>	<ul style="list-style-type: none"> <li>• &gt;65% CHO</li> <li>• &lt;10% Fat</li> <li>• 10 to 20% Protein</li> </ul>
Sample meal plan	<p><b>Breakfast</b></p> <ul style="list-style-type: none"> <li>• 3 eggs, scrambled</li> <li>• 4-6 slices bacon</li> <li>• Coffee or tea with artificial sweetener + cream</li> </ul> <p><b>Lunch</b></p> <ul style="list-style-type: none"> <li>• Chicken salad (180g chicken, 1 tbsp Romano cheese, 2 cups salad, 2 tbsps ranch)</li> </ul> <p><b>Dinner</b></p> <ul style="list-style-type: none"> <li>• Steak</li> <li>• 1 cup salad with bacon bits and 1 tbsp ranch</li> <li>• 1 cup asparagus</li> </ul>	<p><b>Breakfast</b></p> <ul style="list-style-type: none"> <li>• ½ cup blueberries</li> <li>• 2 tbsp raw almond</li> <li>• 1 cup bran flakes</li> <li>• 180g skimmed yoghurt</li> </ul> <p><b>Lunch</b></p> <ul style="list-style-type: none"> <li>• Side green salad with olive oil and lemon juice</li> <li>• Minestrone soup</li> <li>• 4 pcs wholewheat crackers</li> <li>• 1 slice non-fat cheese</li> <li>• 1 cup skimmed milk</li> <li>• 1 orange</li> </ul> <p><b>Dinner</b></p> <ul style="list-style-type: none"> <li>• Mixed greens with balsamic vinaigrette</li> <li>• Oven-baked fish</li> <li>• 1 medium sweet potato</li> <li>• 1 tbsp reduced fat sour cream</li> </ul>	<p><b>Breakfast</b></p> <ul style="list-style-type: none"> <li>• Wholegrain cereal with fat-free yoghurt</li> <li>• Orange juice</li> </ul> <p><b>Lunch</b></p> <ul style="list-style-type: none"> <li>• Baked potatoes stuffed with fat-free cheese and spinach</li> <li>• Broccoli</li> <li>• Potato salad with fat-free dressing</li> <li>• Green salad</li> <li>• Fresh fruit</li> </ul> <p><b>Dinner</b></p> <ul style="list-style-type: none"> <li>• Bread with tomatoes and capers</li> <li>• Wholemeal pasta with vegetables</li> <li>• Peaches in wine</li> </ul>
Calorie per day	1595 kcal	1219 kcal	1319 kcal
Carbohydrate per day (% of Energy)	27.1g (6.8%)	120.3g (40%)	206.1g (62.5%)
Protein per day (% of Energy)	160.5g (40%)	84.5g (27.7%)	59.9g (18.2%)
Fat per day (% of Energy)	94.4g (53%)	45.2g (33.4%)	23.3g (15.9%)

**FACTS ON FATS**

Fats have probably got to be the most maligned nutrient in nutrition and well-being. Having 9 calories per gram, it is the most energy dense macronutrient and most likely to increase the calorie density of the diet. However, all fats are not the same. Contrary to popular belief, the much-maligned fats are not all bad for us. Certainly, there are some ‘bad’ fats that are harmful when eaten in excessive quantities. They are other fats that are more than just ‘good’ for us; they are essential.

Broadly speaking, fatty acids are grouped into 3 classes – saturated fatty acids (SFA), monounsaturated fatty acids (MUFA) and polyunsaturated fatty acids (PUFA). Trans fatty acids (TFA) are geometrical isomers of cis-unsaturated fatty acids that adapt a saturated fatty acid-like configuration.

SFA and MUFA can be synthesized in the body and hence are not dietary essentials. PUFA can be subdivided into n-6 PUFA and n-3 PUFA, derived from linoleic acid (LA) and alpha-linolenic acid (ALA) respectively. These are essential fatty acids, since they cannot be synthesized in the body.

The food sources of fats can be found in Table 2. Foods are classified as saturated, monounsaturated or polyunsaturated depending on the fatty acid that is found in the largest amount or proportion.

Different types of fatty acids and dietary cholesterol can affect the blood lipoprotein levels. Table 3 summarizes the effects of these nutritional determinants on blood lipid profile.

**CARDIOPROTECTIVE DIET TO REDUCE CHOLESTEROL LEVELS**

The MOH’s CPG on Lipids has a similar approach to the National Cholesterol Education Program in the US<sup>8</sup>. The Adult Treatment Panel III report recommends a multifaceted lifestyle approach, Therapeutic Lifestyle Changes (TLC), to reduce risk for coronary heart disease<sup>9</sup>. Please refer to Table 4 for comparison on the recommendations.

Cardio protective dietary advice should always be set in the context of healthy eating. Over-focus on one nutrient (such as saturated fat) can risk compromising the intake of others (such as iron and calcium) if dietary advice is not comprehensive. A cardio protective diet encourages total fat restriction through consumption of lean meat, skinless poultry and low fat dairy along with adequate and regular consumption of oily fish, fruits, vegetables, wholegrain cereals and legumes.

There are also other dietary factors related to CVD. Soluble fibre, folate, phytosterols, flavonoids, garlic, nuts have been shown to improve LDL cholesterol levels<sup>10-13</sup>. There are no clear-cut benefits of lycopene, soy protein and vitamins A, C and E on cholesterol<sup>14-16</sup>. Moderate consumption of 1 to 2 standard drinks of alcohol improves HDL cholesterol<sup>17</sup>. The lipid fraction (kahweol and cafestol) of coffee is shown to increase cholesterol levels<sup>18</sup>.

As nutritional research is constantly evolving, evidence for dietary factors relating to cardiovascular disease risk will be further identified.

**Table 2: Types of Dietary Fats and its Food Sources**

PUFA	MUFA	SFA	TFA
<p><b>n-6 PUFA</b></p> <p>Most PUFA oils</p> <ul style="list-style-type: none"> <li>• Safflower oil</li> <li>• Sunflower oil</li> <li>• Sesame oil</li> <li>• Corn oil</li> <li>• Cottonseed oil</li> </ul> <p>Many seeds:</p> <ul style="list-style-type: none"> <li>• Sunflower seeds</li> <li>• Sesame seeds</li> </ul> <p>Other foods</p> <ul style="list-style-type: none"> <li>• Breads</li> <li>• Cereals</li> <li>• PUFA margarines and spreads</li> </ul> <p><b>n-3 PUFA</b></p> <ul style="list-style-type: none"> <li>• Fish</li> <li>• Seafood</li> <li>• Omega-3 eggs</li> <li>• Lean red meat</li> <li>• Linseeds</li> <li>• Linseed oil</li> <li>• Mustard seed oil</li> <li>• Canola oil</li> <li>• Canola margarine and spreads</li> <li>• Walnuts</li> <li>• Pecans</li> <li>• Soybean oil</li> <li>• Soybeans</li> <li>• Baked beans</li> <li>• Red kidney beans</li> </ul>	<ul style="list-style-type: none"> <li>• Olives</li> <li>• Olive oil</li> <li>• Olive oil based margarine and spreads</li> <li>• Canola oil</li> <li>• Canola margarine and spreads</li> <li>• Mustard seed oil</li> <li>• Avocados</li> <li>• Avocado oil</li> <li>• Peanuts</li> <li>• Peanut oil</li> <li>• Peanut butter</li> </ul> <p>Most nuts:</p> <ul style="list-style-type: none"> <li>• Cashews</li> <li>• Almonds</li> <li>• Pecans</li> <li>• Macadamias</li> <li>• Hazelnuts</li> </ul>	<ul style="list-style-type: none"> <li>• Coconut</li> <li>• Coconut oil</li> <li>• Palm oil</li> <li>• Palm kernel oil</li> <li>• Chocolate</li> <li>• Cocoa butter</li> <li>• Butter</li> <li>• Lard</li> <li>• Dripping</li> <li>• Ghee</li> <li>• Beef tallow</li> <li>• Poultry skin</li> <li>• Fatty meat</li> <li>• Deli meat e.g. salami, devon</li> <li>• Meat pies</li> <li>• Sausages</li> <li>• Bacon</li> <li>• Full cream milk</li> <li>• Cheese</li> <li>• Cream</li> <li>• Sour cream</li> <li>• Non-dairy creamer</li> <li>• Fast foods</li> <li>• Commercial cakes, biscuits, donuts and pastries</li> <li>• Potato chips</li> </ul>	<p>Naturally in small amounts in</p> <ul style="list-style-type: none"> <li>• Full fat dairy products</li> <li>• Meat fats</li> </ul> <p>Other foods</p> <ul style="list-style-type: none"> <li>• Hydrogenated fats</li> <li>• Deep fried foods</li> <li>• Shortening</li> <li>• Hard margarines</li> <li>• Commercial biscuits, cakes and pastries made from the above fats</li> <li>• Commercial deep fried products that reuses frying oils</li> </ul>

**Table 3: Nutritional Determinants of Lipoprotein Levels**

Type	TC	LDL-C	HDL-C	TG	Comments
<b>n-3 PUFA</b>					
• α-linolenic	↓	↑	↓	↓↓	• ↑ in LDL if initial LDL is high
• EPA	↑	↑	↓	↓↓	• ↓ in HDL if fed in large quantities
• DHA	↑	↑	↓	↓↓	
<b>n-6 PUFA</b>					
• Linoleic	↓	↓↓	↓	↓	• HDL may ↓ if >10% of total energy
<b>MUFA</b>					
• Oleic	↓	↓	↑	neutral	
<b>SFA</b>					
• Lauric	↑	↑	↑	↑	
• Myristic	↑	↑↑	↑	↑	
• Palmitic	↑	↑↑	↑	↑	
• Stearic	-	-	-	-	
<b>TFA</b>					
• Elaidic	↑	↑↑	↓	↑	
<b>Cholesterol</b>	↑	↑	-	-	

↓,↑ : decrease or increase; ↓↓,↑↑ : appreciable decrease of increase

**Table 4: Comparison of the MOH’s CPG on Lipids and NHI/NHLBI’s Adult Treatment Panel (ATP) III Guidelines**

Nutrient	MOH’s CPG on Lipids	TLC in ATP III
TF	25-35% E	25-35% E
SFA	<7% E	<7% E
PUFA	6 to 10% E	Up to 10% E
MUFA	Up to 10% E	Up to 20% E
TFA	<1% E	Trans fatty acids are another LDL-raising fat that should be kept at a low intake
Carbohydrate	50 to 60% E (mainly from complex CHO)	50-60% E (should be predominantly derived from complex CHO)
Protein	~15% E	~15%
Cholesterol	<200mg/day	<200mg/day
Fibre	20 to 30g/day	20 to 30g/day
Fruits & Vegetables	2 + 2 servings (≥400g) per day	NA
Total calories	Enough to achieve and maintain a BMI of 18.5 to 23 kg/m2	Balance energy intake and expenditure to maintain desirable body weight / prevent weight gain
<b>Therapeutic options for LDL lowering</b>		
Plant stanols/sterols		2 g/day
↑ soluble fibre		10-25 g/day
Total calories		Adjust total caloric intake to maintain desirable body weight/ prevent weight gain
Physical activity		Expend at least 200 kcal/day

**FADS ON FATS**

This section serves to help in answering myths or “Frequently Asked Questions” about dietary fats.

**(i) Eating more fats makes you fatter.**

Eating more calories than you can burn makes you gain fat or weight. Whether those excess calories come from protein, carbohydrates or dietary fat, any calories that you eat above your daily energy requirements will get stored away as body fat. Fats are the most calorie dense nutrient per gram-for-gram of food. So if you aren’t careful, you can end up eating more calories in foods with higher fat content, even though you are eating the same amount of food.

**(ii) Low-fat means low calorie.**

Many pre-packaged foods that are marketed as low fat and fat free have lower fat content than their regular counterparts but the calorie content may or may not be lower. When food manufacturers remove the dietary fat to make low-fat or fat-free foods, the foods themselves lose much of their flavour and texture. To make up for the bland taste, they load them up with sugar, as well as add fillers or fat-substitutes to improve the “mouth-feel” of the food. Therefore, it is important to read nutrition labels carefully to choose a food product with lower calorie content.

**(iii) Reduced-fat foods are always low in fat.**

These foods are lower in fat than their regular counterparts, but that doesn't necessarily mean they are "low-fat". A "low-fat" claim has less than 3g of fat per 100g of food or <1.5g of fat per 100ml of beverage, while a "reduced-fat" claim means the food or beverage has 25% lesser fat than the regular versions. Read the nutrition label and compare the fat content of two similar products.

**(iv) Fat-free means taste-free.**

Although many of the first fat-free products on the market did not meet taste expectations, today's products have greatly improved. If certain fat-free products don't satisfy your taste buds, try low-fat versions. Slight adjustments can add up, and just a little fat can go a long way in adding both flavour and texture to a food. Think of skim milk versus low fat milk.

**(v) All margarines contain trans fat.**

Soft margarine has less than half the amount of trans fat compared to hard margarine. A teaspoon (5g) of soft margarine provides less than 1g of trans fat. There are also several varieties of trans fat-free soft margarine on the market.

**(vi) Is margarine a healthier choice than butter?**

The total amount of saturated fat and trans fat in soft margarine is less than half that in butter. Hence, soft margarine is still a healthier choice than butter.

**(vii) Are all vegetable oils the same?**

No, most blended vegetable oils have proportionately higher levels of saturated fat compared to pure vegetable oils such as canola, sunflower or corn oils. Many blended vegetable cooking oils contain palm olein as the main ingredient and have 40-50% saturated fat.

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