Section 8 :

Nutrition & Weight Management

Diet

by Marjorie T Hagerman

Introduction

A 2,000m race requires all-out effort for approximately six to eight minutes. If a rower goes into the race having followed a proper diet during the preparatory training period, there should be enough glycogen stored in the muscles and liver to support the demands of the anaerobic/aerobic effort required. It is not necessary for a rower to superload the muscles with glycogen as a marathon runner or Tour de France cyclist might do. A rower's goal on race day, with regard to diet, is to have enough glycogen stored in the working muscles to fuel less than ten minutes of intense exercise. During such an intense effort, a rower will expend approximately 25 to 35 calories per minute, depending on individual body size and rate of metabolism. When the diet is optimal in carbohydrate, the body's working muscles can store up to 300 to 400 grams of glycogen (1,200 to 1,600 calories) to have available as fuel during exercise. The liver will contain stores of an additional 100 grams of glycogen (400 calories) that can be converted to glucose to fuel the exercising muscles. Fat can be stored by the body in larger amounts, and can also be used to fuel energy demands, however, carrying excess body fat is usually detrimental to performance. Fat is also less efficient than carbohydrate at producing calories from the limited amount of oxygen available during flat-out exercise.

The real issue, then, when looking at a rower's diet, is not what he or she eats on the day of the race, but whether they are able to maintain glycogen in the muscle at an optimum level to support their training regime for the days leading up to the competition. To support the high energy requirements of one or two vigorous training sessions on a daily basis requires a diet which is high in carbohydrate; adequate in protein, vitamins, minerals and fluids, and minimal in fat. Without attention to diet composition the rower runs the risk of gradually depleting glycogen stores during each training session and never allowing the muscle to fully regain its potential supply. This situation not only makes it difficult to obtain the greatest benefits from a training programme, it also means the athlete could enter the competition with glycogen stores that are unable to sustain an all-out competitive effort. At a recent team selection process, for example, an oarswoman participated in nutritional counselling, mainly because she was suffering from low energy and was unable to train at the level she wanted to. She thought that her low energy level might be due to a diet lacking in iron. Analysis, however, showed that, while her iron intake was fine, only 36% of her daily calories came from carbohydrate - well below the recommended 60% level. In reality, she was not eating enough carbohydrate foods to provide the necessary glycogen levels to support her training. Her goal was to change her diet to maximise her training and competitive efforts.

Carbohydrate: 60% of Total Calories

Practically speaking, how does one get the recommended 60% of total calorie intake as carbohydrate? Since a normal diet provides about 50-55% of calories as carbohydrate at best, food selection for a rower has to change to facilitate a good training diet. Foods supplying a high level of nutritious carbohydrate need to be increased; these include breads, cereals, pastas, fruits and vegetables, dried beans and peas and dairy products made from skimmed milk. Instead of the recommended four daily servings each from the high carbohydrate containing fruit/vegetable and bread/cereal groups, an athlete should have eight servings

from each of these groups to continually replenish glycogen stores which are consumed during training efforts. Also, it's wise to have some of the fourteen weekly servings from the protein rich meat/fish/poultry/nut group provided by legumes - kidney beans, butter beans and soya beans, peas and dried peas, and lentils; these inexpensive foods not only provide a source of almost fat free protein, they are also high in carbohydrate.

Many rowers believe that eating toast and cereal for breakfast and a plate of spaghetti for dinner translates into a high carbohydrate diet but this is not necessarily so. Although grain products certainly are an important part of a high carbohydrate diet, one must also include generous amounts of fruits, fruit juices and vegetables, and at least two to three servings of low fat milk products daily. Remember, in order to keep the carbohydrate intake high, and the protein level adequate, the only expendable item in the diet is fat.

In summary, a rower would want to plan his/her diet around the following foods:

Breakfast

- Cereal, toast, bagels
- Fruit and fruit juices
- Eggs (boiled or poached are prepared without added fat and are therefore preferred); limit to 3 to 5 per week
- Lean ham - no more than twice per week (no bacon or sausage)
- Low fat yoghurt or soft cheese
- Skimmed or semi-skimmed milk

Lunch and Dinner

- Low fat soup
- Salads with low fat or vingerette dressings
- Vegetables of all kinds
- Lean meat, fish, poultry; skinless and steamed or roasted rather than deep-fried
- Peanut butter (in limited amounts)
- Bread/rolls/bagels
- Fresh or tinned fruit in unsweetened juice
- Low-fat frozen yogurt, sorbet (other desserts limited to 2 to 3 times per week only)
- Skimmed or semi-skimmed milk

Snacks

- Jam or peanut butter sandwiches
- Fresh or dried fruits and fruit juices
- Fig bars, oatmeal cookies
- Ice lollies, low-fat fruit yogurt, power bars

Athletes often wonder about the wisdom of including sweets as a part of their high carbohydrate training diet. From a standpoint of glycogen replacement, in the first 24 hours following an event, carbohydrate from simple sugars has a slight edge over starch carbohydrate in replenishing muscle glycogen. However, during the following 48 hours, starch carbohydrate is preferable for optimal glycogen stores. The practical

suggestion is to include a mixture of carbohydrates, with concentrated sweet foodstuffs (biscuits, sweets, cakes, sweet desserts) eaten only in limited amounts, since they are also frequently high in fat and don't come packaged with as many other valuable vitamins and minerals (folic acid and iron, for example) as do carbohydrates from grains, fruits, vegetables and legumes.

What is the coach's role in helping the athlete to choose a high-carbohydrate diet? Making sound information available to the athlete is certainly an important first step, but probably even more important than your words (or the words of a sport nutritionist or registered dietician), are your actions. Whenever a team meal is planned, arrange for it to be high in nutritious carbohydrate foods, so a model of appropriate choices is apparent to the rower. If the oarsmen/women know the rationale for high carbohydrate training diets, and are then taught through example what foods are good choices to include in their training meals, they can benefit from a perfect follow-up of educational theory put into practice.

Protein: 15-20% of Total Calories

Protein is used by the body to build and maintain cell tissues of all kinds - from blood to bone and especially muscle. Since an athlete usually has a higher proportion of lean body mass to fat and bone than the non-athlete, protein needs are slightly greater than those of the average person. Protein need is based on one's size and stage of growth and is expressed as grammes of protein required per kilogramme of body weight. A standard recommended daily allowance (RDA) chart found in any nutrition textbook will list a recommended protein intake for various age groups, based on an average weight. An individual athlete's protein need can be worked out more precisely by multiplying their weight in kilogrammes by 1.4 to obtain the recommended number of grammes of protein they need per day.

Example: An oarsman weighing 95 kilogrammes would need 133 grammes of protein each day. i.e.
95 kilogrammes x 1.4 grammes protein per kilogramme of body weight = 133 grammes protein per day

An athlete who is receiving the correct amount of protein each day will have enough to meet present body needs and also have enough additional protein to provide for any increase in lean muscle mass which may be realised through a weight training programme. It is not difficult to obtain this amount of protein through a balanced diet. Protein is available from many different foods in varying amounts:

	Grammes Protein
1/2 pint of milk (any fat level)*	8
4 ounces of meat, fish, or poultry without bone*	28
1 cup serving of dried beans or peas, cooked	9
2 servings of peanut butter	14
1 cup serving of cereal, potatoes, or pasta	6
1 slice of bread, 1/2 bread roll or bagel	3
1/2 cup serving of vegetables	2

* high quality complete protein

In order to check whether they are getting enough protein in their diets, athletes may want to keep a record of everything eaten during one day, along with the amount of each, and use the protein equivalent value to calculate total protein available from these foods. Most athletes who follow a balanced diet that includes foods from all four food groups and has enough calories to maintain weight, will have no difficulty

in meeting protein needs. The exceptions may be those who follow a strict vegetarian or vegan diet, or lightweight rowers who practice severe calorie intake restriction. Vegans who include no meat, fish, poultry, eggs, or dairy products in their diet should be concerned about getting enough high quality protein from their daily meals. These athletes should monitor their protein intake carefully and, if it is below the recommended amount for their body size, they may wish to consult a dietician to help incorporate more protein into their diet. For lightweight rowers, a 5 to 6% body fat for men or 10 to 11% for women represent dangerously low levels of body fat and should prompt immediate consultation with a dietician to adjust dietary intake.

In recent research conducted with candidates for US national teams, all of the men, both heavyweights and lightweights, obtained adequate protein from their diets to meet the recommended level of 1.4 grammes protein per kilogramme of body weight. In contrast, only 60% of the women, again including both light- and heavyweights, met their protein needs. More of the women tended to be vegetarians, or were at least limiting their intake of protein foods from both the meat and dairy groups. It is important to remember that, while carbohydrate is very important, so is protein, and protein intake must be adequate to meet the demands of the exercising body. It may be difficult for the heavyweight vegetarian rower to meet calorific and protein needs on a totally plant-based diet; the sheer bulk of such a diet may mean one is filled up before adequate calories and protein are consumed.

Occasionally athletes wonder about taking protein or amino acid supplements to boost their protein intake. This is unnecessary if one eats a balanced diet; in such a case protein intake from food will usually more than meet needs, and food is certainly the preferred source, since it comes packaged with other nutrients like the B complex vitamins, iron and zinc, all of which are important to an athlete's health. Keep in mind there are inherent dangers in consuming excessively high amounts of protein, whether from food or a combination of food plus protein supplements. Protein foods often carry saturated fat with them, so excess fat intake - something we are all urged to avoid for good health, particularly of our hearts - can accompany excess protein from foods. Since water is required to break down protein to its component amino acids before the body can use it, dehydration can also accompany a high protein intake. This is a particular risk for exercising athletes who require that body fluids be present at an optimum level to cool the working muscles. Also, any excess protein not required for either tissue maintenance or energy production is broken down by the body and stored as fat - again, an undesirable outcome for the competitive athlete.

Fat: 20-25% of Total Calories

Fat is not quite the villain we sometimes make it out to be! The body needs fat to perform a variety of functions - everything from production of healthy skin and sex hormones to protecting the internal organs and carrying certain vitamins throughout the body. Fat is also a valuable energy source, particularly during low-intensity exercise. When the intensity of the exercise increases, however, the body relies primarily on glycogen stores to fuel the working muscles.

Since the body normally has virtually unlimited stores of fat it is not necessary to eat a high fat diet to have adequate fat available for any low intensity workouts. A well balanced diet will provide all the fat required to resupply adipose tissue deposits in the body, which in the average person store in excess of 11,000 grams of fat, or over 100,000 calories! With all this fat stored in the body, we require only about 2 to 10% of our total daily calories as fat to supply adequate amounts of fatty acid called linoleic acid, which the

body cannot make and must obtain from food. Unfortunately, the average person consumes much more than 10% of calories as fat - the figure is currently about 37%.

Not only is it unnecessary to eat a high fat diet to provide fuel for low intensity training, it is undesirable. Total fat, and especially saturated fat from meat, poultry, whole milk dairy products, and several tropical plant oils - coconut, palm and palm kernel - have all been implicated as contributing factors in heart disease, diabetes, and cancer. Also, a diet high in fat can lead to excess weight gain since, gramme for gramme, fat will provide more than twice the calories of carbohydrate and protein, and fat from food is very efficiently converted to fat stores in the body.

Is this recommended amount of fat a change from a usual balanced diet? Definitely. And to achieve this level of fat intake, which is appropriate for rowing training as well as for overall good health. Suggestions to reduce fat from the present 37% of total calories to the recommended 20 to 25% include:

- Limit cheese consumption. (This is one of most commonly eaten high fat foods in a rower's diet.) Switch to the lower fat types of cheese, low or half fat cheese such as mozzarella or cheddar and low fat cottage cheese
- Switch from the regular or premium type ice creams to low fat frozen yoghurt or sorbet.
- Choose margarines made from liquid vegetable (non-tropical) oils rather than butter.
- Limit amount of salad dressings used to no more than two to three tablespoons per salad and stick to low fat or vinegarette varieties.
- Limit the amount of mayonnaise-containing salads such as tuna, ham, egg, pasta and chicken; when preparing these yourself, use the lower fat types of mayonnaise and try substituting low fat yoghurt or fromage frais.
- Avoid fried foods, especially those that are deep-fried. Food which is baked, boiled or steamed absorbs far less fat than those which are fried.
- Limit the amount of rich sauces made with cream and/or butter. Instead, eat pasta with tomato sauce and vegetables with a dash of grated cheese.
- Choose leaner cuts of red meats, eat fish that is poached or baked rather than fried, and remove the skin from poultry.
- Limit intake of concentrated sweets like cakes, biscuits and sweets, all of which are frequently high in fat.

In addition to reducing the total amount of fat you eat, the type of fat you select is also important. Olive, peanut, sunflower and sesame seed oils are all relatively high in monounsaturated and polyunsaturated fatty acids, and low in saturated fatty acids, and are therefore considered more heart-healthy. Avoid foods containing lard, the tropical oils (e.g. palm oil), beef suet, and butter - these are all high in saturated fat. You can tell the kind of fat in a product by reading the ingredients listed on the label, which are required to be in descending order of weight.

Vitamins and Minerals

If a rower has an adequately balanced diet, it is not necessary to take a vitamin/mineral supplement to supply recommended amounts of these regulatory nutrients. The one exception to this might be iron and calcium, which females may need to supplement. In a mixed diet of 1,000 calories, one can expect to receive about 6mg of iron. Since the pre-menopause female requires about 15mg of iron per day, she would have to ingest about 2,500 calories daily, to provide an adequate iron intake. Most oarswomen will eat at this level, and probably even higher, but a lightweight female rower may be consistently below this level of calorie intake and she may need to discuss an iron or calcium supplement with her doctor.

Rowers may wish to consume vitamin C at a level somewhat higher than the RDA for this vitamin. Some research suggests that athletes should consume 3mg of vitamin C per kilogramme of body weight, rather than the RDA of 60mg. A diet that includes four to five servings of the following fruits and vegetables that are rich in vitamin C should easily meet the need:

- Citrus fruit and juice.
- Cantaloupe and watermelon.
- Strawberries.
- Broccoli, spinach and Brussels sprouts.
- Cabbage.
- Tomatoes.

Example: If a rower weighs 82 kilogrammes his/her vitamin C requirement would be 82 x 3 or 246mg vitamin C per day. This could easily be obtained through:

	Mg of Vitamin C
1/2 pint of orange juice	120
1 medium tomato	22
1/2 cup cooked broccoli	49
1/4 of a cantaloupe melon	68
Total	257

Including enough fruits and vegetables to meet this higher vitamin C level would have the added advantage of also including the minerals potassium and magnesium, which were low in the diets of many national rowing team candidates studied recently. As noted previously, fruits and vegetables also provide a rich supply of carbohydrates.

Whenever possible, vitamins and minerals are best obtained from food rather than from supplements. In foods, they come packaged with other nutrients important to good health. Furthermore, when these nutrients come in food, there is little if any danger of ingesting such high levels as to be toxic to the body. The same cannot always be said for supplements, which are often taken in amounts great enough to be dangerous to normal body function.

If a rower for one reason or another however, is unable to eat an optimally balanced diet, he or she may wish to consider a vitamin/mineral supplement. The best advice is to choose an all-purpose "one a day" supplement that provides between 50 and 100% of the RDA for the given vitamins and minerals. In combination with nutrients received from the diet, this should provide a safe level of supplementation. It is wise to check with a doctor before supplementing iron to the diet.

Fluid Consumption

It is essential to take onboard enough fluid to maintain an adequate level of body hydration. During training, heat is generated as a by-product of energy production to fuel the muscles, and this heat must be dissipated in order to stop the body's core temperature from rising to a dangerously high level. The body can rid itself of heat by:

- Dilating the blood vessels of the skin, which in turn increases the flow of blood to the skin and releases the heat to the environment by radiation and convection.
- Secretion of sweat onto the surface of the skin requiring heat calories to evaporate the moisture, causing a cooling reaction.

In hot weather especially, it is the cooling by evaporation process that allows exercise to continue, but only if these sweat losses are replaced. When training in hot weather, sweat losses from the body can be in excess of two litres per hour, and these need to be replaced during and following training. Some practical guidelines to help maintain optimal fluid balance during training:

- Cool fluids (5 to 10°C) are more quickly absorbed from the stomach and small intestine.
- If a sweet drink is preferred, the carbohydrate content should be present in no greater than an 8% solution, so as not to delay fluid emptying from the stomach or absorption of fluid from the intestinal tract into the blood.
- Drink 400 to 600ml 2 to 3 hours before exercise.
- During exercise, rehydrate by drinking 200 to 300 ml of cold fluid every ten to 20 minutes of activity. It's important not to wait until you feel thirsty to replace fluids. Thirst usually doesn't develop until 1 to 2% of body weight is lost through dehydration, and performance can be adversely affected at a 2% loss. The neurophysiologic stimulus for thirst is inadequate during and following exercise.
- Following exercise, it is recommended that 800ml of fluid should be consumed for every pound of weight lost through sweating. Rehydrate within two hours of exercise.
- In general, use of mineral supplements such as salt tablets to replace electrolytes lost in sweat is not necessary for rowers engaging in usual training regimes. Adding a little extra salt to daily meals and including high-potassium foods, such as citrus fruits and bananas, should easily replace the small amount of electrolytes lost.
- Loss of valuable electrolytes in sweat depends on such factors as gender, body size, heat adaptation, fitness, and environmental conditions. Losses of sodium, calcium, potassium, chloride, and other important ions will vary among individuals. Commercial drinks will provide adequate replacement of electrolytes and, at the same time, replenish carbohydrate stores. More importantly, however, drinking an isotonic sports drink and water will restore depleted body fluids for both the muscle and its transport systems and also ensure successful thermoregulatory function.

The Pre-Race Meal

The ideal pre-race meal will vary with the individual, depending what he or she has learned through experience is comfortable and effective. The following general guidelines may be of help as each athlete learns what foods are tolerated best during pre-race anxiety.

- Eat a small meal of no more than 500 to 800 calories about two to three hours before the race, so the stomach has time to start emptying before competition begins.
- Select starchy or "complex" carbohydrate foods that are digested relatively quickly and can boost glycogen supplies in the working muscles. Avoid excessive intake of foods high in sugar, which may cause stomach upset and may trigger reactive low blood sugar levels.
- A small amount of protein should be eaten, but avoid fatty foods or those prepared in fat. Fat takes longer than any type of food to leave the stomach.
- Avoid those foods that tend to produce gas, such as beans, onions, peppers, cabbage, cauliflower and apples. Gas-forming foods will vary for each individual.
- Avoid spicy foods and those that are new and untried. Just before a competition is not a good time to experiment with new cuisine; stay with the tried and tested.
- Be wary of foods that are high in indigestible fibre. Though high fibre foods help promote good intestinal function, they can also lead to diarrhoea and increase the risk of dehydration. General abdominal discomfort from flatulence can also be a problem with high fibre intake.

Below are two examples of a pre-event meal. This is especially important for athletes who suffer from nervous stomachs before competition and will better tolerate more readily digestible liquids and smaller amounts of certain solids than large amounts of solids.

Breakfast

Total Calories: 419

- 1/2 pint orange juice
- 1 poached egg
- 2 slices toast
- 2 tablespoons jam
- 1/2 pint skimmed milk

Lunch

Total Calories: 550

- 1/4 pint tomato juice
- 2 ounces baked fish
- 1 cup rice
- 1 orange
- 2 biscuits
- 1/2 pint skimmed milk

Don't neglect nutrition after the race is over. This is the time to replace glycogen used during the event. Research suggests that 1.5 grammes of carbohydrate per kilogramme of body weight should be consumed immediately and at two hour intervals during the first four hours after exercise. Don't forget to replace fluids after the event, as discussed earlier.

Weight Control

Lightweight rowers must constantly face weigh-ins, and are thus concerned with techniques to lose weight without losing strength and endurance. Weight should be lost gradually through a combination of reduced calories from food and increased calorie expenditure via more intense, frequent and longer duration workouts. Try to limit weight loss to a maximum of 1% of current body weight per week. By using a two-pronged approach, reducing calorific intake and increasing energy expenditure through exercise, the weight is more likely to be kept off rather than regained, and most of the weight lost is fat rather than lean muscle mass.

When losing weight, it is important for males to consume a minimum of 1,500 to 1,800 calories per day and for females to not go below 1,000 to 1,200 calories per day. Going below these minimum calorie levels risks a low intake of vitamins, minerals and protein, thus compromising nutritional health. When cutting calories, start with alcohol and then look for foods high in fat and sugar, as these are expendable. Fresh fruits and vegetables, whole grain breads and cereals, skimmed milk, fish, poultry, and lean red meats should provide the basis for a weight loss diet. It is neither necessary nor desirable to eliminate any food group from a reduced calorie diet - simply choose those foods within each group that contain fewest calories from fat, and eat smaller servings of all foods.

Don't neglect fluids. Even when trying to lose weight, the body should be kept adequately hydrated. Losing water weight is deceiving - the scale may register a lower number of pounds or kilogrammes, but it is weight that must be replaced for safe and optimal training and performance. Weight loss should mean fat loss not water loss. The practice of losing water weight by excessive sweating, use of diuretics, laxatives, even enemas prior to weigh-in, and then planning on whatever time is available (often little or none) between weigh-in and race time to rehydrate the body to normal levels, is risky at best and dangerous at worst. It should be noted that the use of diuretics is banned. Research at Ohio University's Human Performance Laboratory has shown a decrease in aerobic endurance occurs with as little as 2% of body weight lost through dehydration, and a decrease in strength has been documented when 3 to 5% of weight is lost through dehydration. Furthermore, one should probably allow a minimum of six hours to completely rehydrate the fluid depleted body. Although weight regain will occur in less time when rehydrating, it takes more than five hours for fluid to become evenly distributed to all the cells, where it is essential for proper metabolism.

Recommended Reading

- **Nancy Clark,** ***Nancy Clark's Sports Nutrition Guidebook***
  Human Kinetics Europe Ltd, 1997
  ISBN: 0873227301
- **Anita Beau,** ***The Complete Guide to Sports Nutrition (Nutrition and Fitness)***
  A & C Black, 2000
  ISBN: 0713653892

Losing Weight without Losing Strength

Different people use different approaches to achieving race weight. A point of agreement was that weight should not rise more than around 6kg during the winter. However, earlier in the guide Kurt Jensen explained that he believed that lightweights should not reduce their food intake but should increase their training volume to lose the required weight. Below we have also included interviews with former world champions Gearoid Towey and Tony O'Connor who do diet but avoid salads because of their high water content despite their low calorific value. Tom Kay however, another former world champion, does use salads as a part of his dieting to achieve his target weight. This highlights the fact that what works for one person is not necessarily right for everyone.

As lightweights normally allow their weight to increase by up to 6kg in winter, above their summer racing weight, and as indoor rowing is predominately a winter sport, we take this into consideration when setting weight limits.

Gearoid Towey and Tony O'Connor

Gearoid Towey and Tony O'Connor were the 2001 Lightweight Pairs World Champions. They have set out below the strategy that they employ when coming down to weight for a competition.

Gearoid has been an international lightweight oarsman since 1995, representing Ireland in almost every boat class. He raced the lightweight coxless four at the Sydney 2000 Olympics.

Tony has been an international lightweight since 1993 and has represented Ireland in sweep rowing at nine World Championships. He has raced the lightweight coxless four at two Olympics and has five medals from World Championships.

"In the winter we allow ourselves to get up to 76kg but no higher if at all possible. From Christmas onwards we become more conscious of what we eat and try to cut out fatty foods, for example only using skimmed milk. This allows us to come down to 73kg without much difficulty. When we start to come down to weight it is important not only what we eat but when. Normally, after a long distance or a high energy usage session, we would try to eat within 20 to 30 minutes something high in simple carbohydrates. After a weights session we try to have a high protein intake in the first 20 minutes, for example a pint of milk. Whenever possible we avoid eating immediately before bed and preferably eat before 8pm. About three weeks before the first weigh-in we begin to be very careful about what we eat, avoiding crisps, chocolate and other luxuries whilst maintaining a low fat but high energy diet.

On the week of the race we aim to be a maximum of 1.5kg overweight; we then control these last 1.5 kg with food and drink intake. In the last two days the most important thing is how much the food and drink you consume weighs, so we tend to eat pastas and cereal bars in small quantities. Lots of lightweights eat salad in the week before the race but this actually retains water and means that it is then harder to get down to weight. We feel it is much better to eat small amounts of higher energy foods that prepare you better for your race.

The night before the race we aim to be 1kg over weight. Of this it is normally possible to lose 0.6kg overnight whilst sleeping and lose the remaining 0.4kg in the warm up paddle.

It is important to be well prepared at the weigh-in. We normally take two bottles of sports drink each and three bread rolls with jam. This means that as soon as we have weighed in we can replace as much

energy and fluids as early before the race as possible. We try and eat these slowly as if you bolt them down you often feel sick. We then sip water right up until we boat and take a waterbottle with us. During the two hours between weigh-in and racing we normally consume about 1.5 litres of water each. During the last two days it may be necessary to become slightly dehydrated, this is preferable to not eating as you can replace lost fluids in the two hours after weigh-in but cannot make up for days of insufficient energy intake."

When asked whether they do weight training in the lead up to a regatta Gearoid and Tony commented:

"As lightweights we never aim to gain weight through doing weight training because we do not tend to do the eight to 15 reps weights and so do not put on much muscle bulk. We tend to do weights right up to six days before an international regatta and three days before a domestic regatta. These are either power weights of six or seven repetitions at 50 to 60% of maximum or maximal lifts weights, one to three reps."

When you are tapering do you change your sleep patterns?

"People get tied up with oversleeping etc before a big regatta. This actually decreases metabolic rate and hence affects your performance. Sleep patterns should be kept as normal as possible as the decrease in workload should allow you to feel as rested as possible."

Tom Kay

Tom Kay has been a lightweight international oarsman since 1989. He has raced at nine world championships and two Olympics. He has four World Championship medals, three of which are gold. At the time of writing Tom was preparing for the World Championships in the lightweight double with the aim to continue on to the Athens Olympics.

"During the winter my weight when I am training can be as high as 79kg and if I am not training that goes quickly up to 84kg. This means that I have to be aware of my diet throughout the year. If I am not I find myself over 80kg, and this would make it very difficult for me to reach my racing weight of 71kg. I try to come down to weight gradually over the year so that I am close to the 75kg limit required for the winter trials, and then can, if necessary, sweat down to reach weight.

"This year I have been working with a nutritionist, and have been keeping a diary of my food intake and counting the calories of the foods I am eating. This has had two benefits for me. I know that a person of my size with my training load should require between 3,000 and 3,500 calories per day so I try to maintain an energy intake of between 2,000 and 2,500 calories. The second benefit is that my diary of food intake has also been analysed to ensure that I am getting all of the required dietary constituents and as a result of this I am taking the required supplements."

It is just over three weeks until the World Championships: how heavy are you now and are you on target to make weight?

"At the moment I am 74kg and am happy that I am on target to make the 71kg I need to be on race day. The last few weeks have been difficult for me as I have been unwell and I always struggle to know whether to eat well to help get better more quickly or to continue dieting. For me, losing three kilos in the last few weeks is normal. At the first race of the season I am normally 74kg a couple of days before weigh-in and I struggle to make weight but, as the season progresses, my body weight comes down gradually and so by the World Championships I should be on weight without losing any strength."

How will you approach the last few days before your race?

"During the last week I will aim to lower my body weight by reducing food intake whilst keeping a balanced diet including maintaining my protein intake, without which the body burns its own stores e.g. muscle, as well as maintaining my intake of vegetables and salads which, whilst being more or less free calorifically, contain vital nutrients. The day of the race I aim to wake up at 72kg which leaves me only 1kg to sweat out before the weigh-in."

Weight Management

Target Group: Anyone wishing to lose weight or maintain a healthy weight.

Introduction

Many people confuse being overweight with obesity. Being overweight may just mean that you weigh more than the average for your height. Often this can be explained by an unusually heavy bone structure or well-developed musculature.

Obesity on the other hand relates solely to the percentage of body fat deposited about the body. These fat deposits will result in body changes such as a bulging stomach or double chins. Women in particular will display drooping breasts and fat deposits on the thighs and both sexes will be subject to flat feet.

Obesity will increase the risk of disease, in particular respiratory and heart disease. It can also lead to conception and pregnancy problems as well as shorter life expectancy and higher mortality rates. High blood pressure, cirrhosis of the liver and diabetes are more common in obese people. In addition obesity will increase the risk of kidney disease, inflammation of the gall bladder, hernias, arthritis and varicose veins.

Weight Check

There are some simple checks to see whether you are overweight; perhaps the simplest is not to weigh yourself but to look at your profile in a mirror. Without pulling in your stomach check for bulges.

A doctor can calculate your percentage body fat by taking a series of measurements with callipers at different points of the body. Pinching yourself on the upper arm, thigh and midriff and seeing if there is more than 2.5cm is a good guide to being overweight.

As you get older, your body shape and make up will change and relying on the scales alone may not be enough. Use a tape to measure your waist, hips and chest to see if there is any increase. When you do use the scales, always use the same ones and at the same time of day, as your weight will fluctuate naturally.

Weight Reduction

Weight reduction is a health issue and it is therefore wise to consult your doctor before embarking on any drastic eating regime.

Psychologial Eating Disorders

Anorexia Nervosa is a serious eating disorder, which occurs most commonly in adolescent girls and young women. Dieting is taken to such an extreme that the person becomes emaciated and, the dangers to health, created by obesity, are replaced with another equally dangerous range of health risks if not treated.

Bulimia Nervosa is characterised by periods of binge eating followed by vomiting or purging the body through excessive fasting, use of enemas, laxatives, diuretics and compulsive exercising.

Compulsive eating is also a psychological problem where the sufferer becomes addicted to food, which often results from depression, frustration, boredom and loneliness.

If you suffer from any of the above eating disorders then you should seek medical advice.

Methods of Weight Reduction

There are two types of aids that are designed to help reduce weight. Active aids require the user to carry out physical activity, which burns calories. Passive aids claim to reduce weight without the need to exercise but these are of little use. For example muscle contractions caused by external electrical stimulation may improve muscle tone if you are particularly flabby but will not reduce weight. Vibrating belts do not break down fat. Although the user may find them relaxing, they do not burn calories. Reducing garments and saunas can lead to temporary weight loss due to sweating, but this loss will be replaced as soon as you take a drink.

Reducing weight will require an amount of self discipline if you are going to be successful. Going to health farms is expensive and they will only control your diet while you are there. For long term success it is up to you. Even your doctor will be able to do little to help unless the weight problem is as a result of a medical condition. If you do need support then a diet club is the best option but you will still have to do the work.

When deciding on an exercise activity, there are a few things to consider. If you are overweight there is already additional stress on muscle and joints. For this reason it is better to avoid activities that cause impact like running. Also it is better to look at activities that are non-weight bearing and this is why the Indoor Rower is ideal.

Start off gently and remember that initially it is better to finish feeling you could do more than being dead on your feet. Gradually increase the training volume as your fitness level improves and don't expect miracles. It took a long time for the fat to accumulate, it will not disappear overnight.

Anyone, whether they train or not, must balance their energy intake with energy expenditure in order to maintain their bodyweight. This is represented by the energy balance equation:

Energy intake = Energy expenditure (± Stored energy)

In reality this means that in an ideal situation where energy intake and expenditure are equal there is no excess energy stored from food and no use of the body's energy stores. If energy intake is greater than energy expenditure the body stores energy in the form of fat. If energy expenditure is greater than energy intake then the body uses stored energy to top up its requirements. It is this principle that people wishing to lose weight must capitalise on.

For weight management, long periods of low intensity exercise are recommended. However, during exercise, the body will use dietary fat before it uses stored fat, so to make your exercise effective, you will need to reduce the amount of fat in your diet.

A balanced diet is one where you match the energy intake through your diet with the energy output of your lifestyle. Energy is measured in calories and is provided by a combination of carbohydrates (glycogen) and fat. For each gram of glycogen we get just over four calories of energy and for each gram of fat we get nine calories. If you exercise at high intensity, you will burn more calories, but they may not be the ones you want to burn, and just counting calories may not take into account the energy source you are using.

To achieve and maintain your weight goals you need to have realistic expectations and not seek a quick fix. Many people have unrealistic expectations, want swift results and give up if these fail to occur. Here are just a few of the weight loss myths exposed:

- Crash diets do not work. Low calorie diets may result in a quick weight loss, but studies show this is usually temporary and that the body gets accustomed to a low calorie intake and slows down the metabolism. On return to a normal diet the metabolism will not be able to speed up sufficiently to burn off the extra food and will store it as fat.
- Skipping meals makes the body famished and causes overeating. It is better to space calorie intake over the course of a day. To lose weight it is best to eat 25% of calories at breakfast, 50% at lunch and 25% at dinner.
- Hard workouts are not the answer. In order to burn fat, slow down and exercise longer to get the body to use its own fat cells for fuel, rather than the glycogen stores in the muscles.

It is very important when dieting in order to lose weight that a sustainable lifestyle is created. Losing more than 1% body weight per week can be detrimental to health and is often caused by dehydration and not actual loss of body fat. In order to successfully lose weight, there are three areas that you need to pay equal attention to for a successful outcome. Two of these are a reduction in the calorific value of the food you eat and an increase in the calories burned via exercise, while the final element is the mental commitment needed to stick to the regime. All three elements are covered in detail within the Training Guide. The four stage programme illustrated in Table 6.1 increases the exercise duration to a maximum of 90 minutes. It is also worth looking at the weight training programme for rowers in Section 7 which, utilises low weights and high repetitions. It is high in energy costs and would be beneficial to anybody seeking to reduce their weight. Finally, make sure you read Section 9 : Sports Psychology. This contains important information on target setting and enforcing success along with a chart to fill in, laying out your goals. This process helps you to measure your successes and failures, and is highly motivating.

Before you start the programme you should take measurements of your waist, hips, chest, neck, biceps, wrists, thighs and calves. It will then be possible to tell if you are making progress towards your ideal body shape. The reason for doing this and not simply relying on your body weight as an indicator of your progress is that as you progress through your training you will increase your muscle bulk. Muscle weighs significantly more per unit volume than fat as it is denser so your weight may not appear to change, or may even go up, but in fact you are losing body fat, and your body shape will indicate this more clearly than your weight.

Table 8.1

Weight Management Programme			
Session	**Light Week**	**Medium Week**	**Hard Week**
	PHASE 1		
1	10′ UT2 18-20spm	15′ UT2 18-20spm	15′ UT2 18-20spm
2	15′ UT2 18-20spm	20′ UT2 18-20spm	20′ UT2 18-20spm
3	2 x 10′ UT2 18-20spm	2 x 10′ UT2 18-20spm	2 x 15′ UT2 18-20spm
4	15′ UT2 18-20spm	15′ UT2 18-20spm	20′ UT2 18-20spm
5	20′ UT2 18-20spm	20′ UT2 18-20spm	25′ UT2 18-20spm
	PHASE 2		
1	20′ UT2 18-20spm	20′ UT2 18-20spm	2 x 15′ UT2 18-20spm
2	25′ UT2 18-20spm	25′ UT2 18-20spm	30′ UT2 18-20spm
3	2 x 15′ UT2 18-20spm	2 x 20′ UT2 18-20spm	2 x 20′ UT2 18-20spm
4	20′ UT2 18-20spm	30′ UT2 18-20spm	30′ UT2 18-20spm
5	30′ UT2 18-20spm	35′ UT2 18-20spm	40′ UT2 18-20spm
	PHASE 3		
1	30′ UT2 18-20spm	40′ UT2 18-20spm	2 x 25′ UT2 18-20spm
2	40′ UT2 18-20spm	45′ UT2 18-20spm	50′ UT2 118-20spm
3	2 x 20′ UT2 18-20spm	2 x 25′ UT2 18-20spm	2 x 30′ UT2 18-20spm
4	30′ UT2 18-20spm	35′ UT2 18-20spm	40′ UT2 18-20spm
5	40′ UT2 18-20spm	50′ UT2 18-20spm	60′ UT2 18-20spm
	PHASE 4		
1	50′ UT2 18-20spm	60′ UT2 18-20spm	75′ UT2 18-20spm
2	3 x 20′ UT2 18-20spm	3 x 25′ UT2 18-20spm	2 x 30′ UT2 18-20spm
3	40′ UT2 18-20spm	50′ UT2 18-20spm	60′ UT2 18-20spm
4	2 x 25′ UT2 18-20spm	2 x 30′ UT2 18-20spm	2 x 40′ UT2 18-20spm
5	60′ UT2 18-20spm	75′ UT2 18-20spm	90′ UT2 18-20spm

Notes for Table 8.1

i. This weight management programme is set out with the sedentary person in mind. If you find that you are feeling fine after completing the session we suggest that you either rest and repeat the session, or rest then repeat half the session. As with any of these training programmes this is left at your discretion and should be dependent on how you are coping.

ii. The programme sets an upper training intensity limit of 65% of maximum heart rate (MHR). You should comfortably be able to maintain a conversation at this intensity.

iii. 2 x 10' UT2 18-20spm means row for ten minutes in your UT2 heart rate band at 18 to 20 strokes per minute, take a short break and then repeat.

iv. The training programme increases in volume through each training period and from one period to the next. If you feel you need more time to recover a short rest of three to four days after each three week training cycle should suffice.

v. When rowing for long periods, you may experience some stiffness in the back. If this is the case check that you are using the correct technique and if necessary get off the machine every 20 minutes and carry out a stretching routine including extension stretches (for example see the rectus abdominus stretch shown in Stretching in Section 1 : Before and After Exercise). Exercises that strengthen the abdominal and back muscles, which control the posture, will also help to alleviate this problem (see Core Stability Training in Section 7 : Weight Training).

vi. The effects of energy consumption are cumulative - the effect is the same whether you complete one hour continuously or break it down to 3 x 20 minutes.

vii. Phases 3 & 4 are certainly not for everybody; many will find Phases 1 & 2 quite adequate. We recommend you seek professional medical advice before embarking on Phases 3 & 4, even if you have completed Phases 1 & 2 and experienced no problems.