THE MASTERS ATHLETE

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Kerry Mummery, PhD.
School of Health and Human Performance Central Qld. University

Ten Things that MAKE an Athlete

Athlete/n. 1. a skilled performer in physical exercises, esp. in track and field events. 2. a healthy person with natural athletic abillity

Having spent 20 years coaching in the sport of competitive swimming I have often heard coaches (and administrators) lamenting over the lack of athletic 'talent' in their pool. Although often a method of explaining the lack of desired performance coming from their pools, it does beg the question **what does make an athlete?** Having been given the opportunity to comment on the issue, I would like to put forward a list of my 'Top-Ten' items. Certainly there are other defining elements that one can think of. If I succeed in getting you to read that far and think beyond what I have written I will have accomplished something by my efforts.

1. Genetics/anthropometrics.

Pick your parents well son (daughter)....There is little doubt that genetics play a tremendous role in the making of an athlete. Height, weight, strength, power, and aerobic capacity are all based genetically and can only be altered by a relatively small degree through training. All things being equal a well-trained, genetically superior individual will out-perform a well-trained, genetically inferior competitor. Fortunately all things aren't equal. Human sport has not evolved to the degree of thoroughbred racing where the most important decisions are made in the breeding pen. This provides a window of opportunity for all of us who may not have picked the right parents to still excel in our athletic endeavours. Of course this also means that Kieran Perkins remains more valuable in the pool than in stud.

2. Strength.

Strength, speed and power are all crucial elements to athletic performance. Speed does kill..... your opponents that is. Careful training of strength for the purpose of improving explosive power is an element that should not be overlooked in any athletes training program.

3. Endurance.

Aerobic power, aerobic capacity and anaerobic threshold, are all terms that flow effortlessly throughout most athletes speech nowadays. The correct balance of fitness and fatigue in the loading phase will successfully maximise one's capacity. Successful unloading of the athlete during the peaking phase with the maximisation of the fitness-fatigue ratio will maximise one's performance.

> "DIVERSITY IS THE KEY TO A SUCCESSFUL INVESTMENT STRATEGY. SIMILARLY A WELL-ROUNDED APPROACH TO SPORT AND LIFE WILL ENHANCE, RATHER THAN DETRACT FROM, THE ATHLETIC EXPERIENCE. DO NOT BE FOOLED BY THOSE WHO ESPOUSE AN OVERLY MYOPIC FOCUS ON SPORT PERFORMANCE. THOSE WHO PUT ALL THEIR EGGS IN ONE BASKET ARE SURE TO SEE THEM BREAK AT THE MOST INOPPORTUNE TIME."

4. Flexibility.

All too often overlooked in the makeup of an athlete are flexibility and suppleness. Usually only treated as preventative medicine, one just has to look at top athletes in full flight to see how flexibility and suppleness present to the bearer extended range of motion and effortless execution of advanced technique. Often only the flexible athletes are the ones who feel the inhibitory effects of its loss. Turn the focus of your stretching sessions into one of performance enhancement than simply injury prevention.

5. Mechanical Efficiency.

Having given physical capacity its due I must emphasise that no matter the sport the ability to apply force efficiently over time is ultimately based in technical ability. Mechanical ability/superiority can only be achieved through much repeated practice and attention to detail. This is not to say that you should become beset by the paralysis by analysis, but I have certainly seen many triathletes in my pool over the years who were arguably fitter than my swimmers but not efficient enough to translate that capacity into swim speed. Spend time focusing on the mechanics of your sport, not simply the volumes of work completed.

6. Knowledge.

A good athlete knows him/herself and knows her/his sport. The combination of internal and external knowledge is essential in determining the training and competitive loads that can be endured successfully. It allows the athlete to push him/herself to the limit, but not beyond, thus producing maximum levels of personal performance. Athletic wisdom lies in the ability to correctly assess the maximum training or performance levels that can be achieved on a given day.

Continued on page 5

This Issue..

Editorial

Hello Readers,

This issue is once again a very interesting read even if I say so myself. I so enjoyed our guest editorial by Kerry Mummery that I got almost to the end before I remembered I was suppposed to be editing. I particularly enjoyed the bit about Kieren being more valuable in the pool than in stud. I'm glad, at least in the pool we can all take pleasure from his performance!

Adair Ferguson finishes off her very extensive article on rowing and nutrition. Wendy Swift gives us some ideas on how to cope with poor performance, something that happens to all of us at some time or another. Gary Slater talks about sports gels. Peter talks about strategies for enhancing fat burning - something he is always trying to do. Ivan Hooper discusses the importance of flexibility in cycling including pictures of specific stretches, and Brendan Humphries discusses strength training for the triathlete. No matter what sport you do, there is something for you in every article.

Peter & Claire

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SPORTS PSYCHOLOGY

Coping with Poor Performance

© by Wendy Swift

At some stage in your competitive career you will have a performance that does not live up to your expectations. The important thing is to be able understand why that occurred and move on in a positive way. If you know what went wrong with your performance you are in the powerful position of being able to do something about it.

The first step is to identify what it is that you do when you perform well. The second step is to analyze the poor performance.

To conduct your self-analysis, prepare yourself as you would for an imagery session. Find a quiet place and time with no distractions. Go through your normal relaxation procedures until you feel free of tension. Closing your eyes, think about your all time best performance. Try and get a picture of it in your mind's eye and re-live the event. **Ask yourself the following questions:**

1. How did you feel just before the event e.g. flat, too nervous, overconfident?
2. What were you saying or thinking to yourself just before the event started?
3. How were you focussed during the event?
4. Did you follow a well-practiced precompetition plan?
5. What kind of preparation did you have for the event?
6. What were your goals for the event?

You might like to write down the answers and include any other specifics of that event. Now go through the same procedure again, but this time think about the poor performance that you had. Write down the answers and assess what was different between the good and the poor performance. For this method of analysis to be effective it is important that you can create detail in your images of the past events. This detail gives you the insight into how you can improve or correct things that are preventing you from performing well. You will be amazed at how many things are within your control to change.

Here are some **possible causes of poor performance and some solutions to them,** that could be generated from the above list of questions:

Question 1 looks at your level of arousal before the event. If you were too flat or too highly aroused you can control that with the psychological skills of centering, controlled breathing techniques, self-talk and imagery. These are skills that need to be learned, and like any other skill they get better with practice.

Question 2 identifies your self-talk before an event. Self-talk that enhances your performance usually directs your attention to what you need to be focussing on at that time. This might include your level of effort, your competition strategy or even simple cue words to help you focus your attention, such as "explode" or "steady". Negative self-talk includes focus on things that are inappropriate such as wishing your preparation had been better or wondering if your spouse is watching you. If you can't remember the self-talk you had in a good performance, simply ask yourself what is the most appropriate thing for you to be focussing on at that time. Self-talk needs to be rehearsed in training.

Question 3 directs you to look at how you held your focus during the event. Did you have lapses in concentration, did you start to think negatively or 'throw in the towel'? If this is what occurred you can overcome it with a refocusing plan. This entails identifying the cause of lost focus, knowing when it is likely to happen, and mentally rehearsing how you will maintain your concentration or get back on track. It may include use of a key word, focus cues, thought stopping and imagery.

Questions 4, *and* 5 address your preparation. Was the quality and duration of your training program appropriate? Did you apply yourself in training? Did you include mental practice in your training schedule? Identifying areas of preparation that can be improved is one of the easiest ways to improve. You may find you need to revisit goal setting if training consistency is a problem. Practicing a pre-competition plan or routine is also something that everyone can do and will get you to the start line in the best state of readiness.

Question 6 addresses the goals you had for the competition. If your goals are unrealistic based on your preparation you will be disappointed. For example you may have set a pre-season goal that was realistic but then spent 4 weeks off training due to injury and another 2 weeks away on business trips and yet still expected to reach your original goal. Effective goal setting includes re-evaluating goals constantly to keep you on track and motivated. You may also need some strategic goals for your event such as holding steady at the start, negative splitting, and keeping a certain pace or stroke rate. Sticking to these goals within your event gives you a greater chance of reaching your performance expectations.

In some instances a poor performance can be devastating. Some athletes make huge sacrifices to compete in certain events, including work, relationships, family time and large sums of money! When performance expectations are not met in these circumstances the athlete can be left in a state of grieving. This is a normal way to feel. Something that was extremely important is gone forever and there is a feeling of loss. You may feel like you 'can't believe it', be angry with yourself or seek to blame someone for what happened. Some athletes will withdraw from competition and training altogether. These reactions are normal and can be identified as stages in the grieving process. Try not to make any long term decisions immediately following an experience such as this. Most people work through their grief to a point of acceptance and then move on. Recognize the stages of grief – denial, anger, bargaining (occurs more with injury cases), depression and acceptance – and when you feel ready to move on, go back and analyze your performance as described above. The most important thing is to know what can be improved and set some new goals to ensure you make the changes. Focus on improving what is within your control and don't waste energy on anything that occurs by chance or the will of others. Every event should be seen as an opportunity to learn something new. If you have this attitude your athletic career should last longer and be more satisfying.

"THE MAN WHO WISHES TO ACHIEVE THE LONGED FOR VICTORY IN A RACE MUST AS A BOY HAVE TRAINED LONG AND HARD, HAVE SWEATED AND GROANED, AND ABSTAINED FROM WINE AND WOMEN."

Horace (65-8BC) Roman poet & satirist

The Team

PETER REABURN - Editor

CLAIRE REABURN - Co-ordinator/Editor

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EDITORIAL CORRESPONDENCE

Sports Performance Consultants, PO Box 61, CQU Post Office, Rockhampton, Qld. 4701. Phone (07) 49 265 269.

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SPORT NUTRITION

Sports Gels

© by Gary Slater (Dietitian, AIS)

No they aren't the insert in your new runners, sports gels are more likely the thick syrup you might ingest to help fuel a long training session or race. Performance during prolonged exercise demands consideration of additional fuel supplies. Without this fuel, exercise intensity reduces and performance drops as glycogen stores fall, a condition commonly known as "hitting the Wall" or "bonking". The consumption of carbohydrate foods and fluids during exercise helps delay or possibly prevents bonking.

So what are the options, carbs come from a wide variety of sources? Sure a large bowl of pasta or fruit salad every hour would provide plenty of carbs but it's impractical to carry or consume such nutritious foods while exercising. Imagine the pain of a misplaced fork in your cycling nicks! This is where supplements like sports gels may come in handy as a more convenient way of refuelling.

Composition

What's in a sports Gel? A closer look at Table 1 reveals the energy boost you may experience from a gel comes from carbohydrate, similar to a sports drink or sports bar. In fact, most if not all the energy of a sports gel comes from carbohydrate with negligible amounts of fat and protein. Most gels come in foil or plastic pouches with easy to open necks .They usually contain 20-30g of carbohydrate per sachet, about the same amount as 400mls of sports drink, half a sports bar or a banana. Larger sized gels are now available which contain 2 to 3 times the carbohydrate content of standard gels. These come in resealable containers making it easy to access the gel without any slimy spillage.

In addition to carbs, almost all sports gels contain some sodium or salt, enhancing palatability and assisting in the retention of any fluid ingested with the gel. Sports gels are best tolerated when consumed with fluid. By themselves they may be excessively sweet for some athletes and not well tolerated although the huge range of flavours ensures you should be able to find a gel that suits. Most companies recommend at least 250ml of fluid to be consumed with each 30-40g gel.

Table 1 also shows the array of additional ingredients found in many sports gels. Most appear to be included as ergogenic aids but provide little apart from a potential marketing edge for the uninformed athlete. The ginseng, chromium, branched chain amino acids and other supposed ergogenic ingredients only add to the expense of a simple but potentially beneficial supplement. Even the small amount of caffeine in some gels is likely to offer no performance benefit as it is in such low quantities. Don't be confused by marketing hype, the benefit in consuming a sports gel during training or competition comes from the extra carbohydrate they contain, not the fancy array of additional ingredients.

"THE MAJOR BENEFIT OF A SPORTS GEL OVER OTHER FOODS THAT MAY BE CONSUMED DURING EXERCISE IS THEIR COMPACT SIZE AND EASE OF CARRIAGE"

Sports gels - advantages and disadvantages

Sure sports gels provide some carbs to help maintain blood glucose levels and reduce the rate of liver glycogen depletion but do they offer any advantages over other carbohydrate rich foods? The major benefit of a sports gel over other foods that may be consumed during exercise is their compact size and ease of carriage. A gel can be easily placed in a pocket during a run or taped to a bike during a long ride. They also have a long shelf life, much longer than a banana that has the potential of turning to black mush after two hours of training. However gels provide few additional nutrients outside of carbohydrate, have a low satiety value (ie they don't fill you up or take away your hunger pangs) and do little in assisting to meet fluid requirements. In most sporting events, a sports drink may be a better option as both fluid and carbohydrate requirements can be met simultaneously. Gels are also relatively expensive, usually retailing for between $2-4 each, with the Leppin Squeezy Racer selling for approximately $9. Now that's a lot of bananas but then again, there is only so many bananas you can carry on a long run, ride or paddle. The choice is yours, cheaper traditional foods like sandwiches, fruit and breakfast bars may sound rather dull compared to a gel but they still provide carbohydrate, all be it in a more cumbersome package.

"The major benefit of a sports gel over other foods that may be consumed during exercise is their compact size and ease of carriage"

When & where

Sports gels were designed for consumption during exercise. They could be used before exercise or in recovery as a carbohydrate top up but more nutritious foods and drinks are available and probably should be prioritised over a gel in these circumstances. If a sports gel was to be your only source of carbohydrate during a training session, 2-3 standard gels should be consumed hourly to ensure a carbohydrate intake of 60g per hour, as recommended by sports nutrition guidelines. Alternatively, a combination of sports drink and gel could be used. For example, a masters road cyclist on a 2 hour training ride may choose to consume 2 guzzlers (1500ml) of sports drink, providing 90g of carbohydrate, and 1-2 sports gels for an extra carb top up. More fluid may be available from a tap on the ride but extra fuel supplies may not be as easily obtained.

Gels may be most suited to sports like running, triathlon (especially the run leg), road cycling, hiking, marathon kayaking and any other sport involving exercise periods in excess of 60 minutes that have limited potential for storage of fuel supplies. In such sports the convenience and compact size of a gel may outweigh their cost but as with any new supplement, trial in training with plenty of fluid to assess your tolerance of this little carbo shot before you use it in competition.

Table 1: Nutritional breakdown of the most popular commercially available sports gels

Product	Energy (kj)	Carbohydrate (g)	Fat (g)	Protein (g)	Other Ingredients
Gu (32g)	418	20	2	0	BCAA, ginseng, herbs
Pocket Rocket (37g)	400	25	0	0	Chromium, caffeine, guarana
Squeezy (35g)	400	25	0	0	nil
Squeezy Racer (125ml)	1264	75	0	0	Vit. C
Power Gel (41g)	460	28	0	0	BCAA, caffeine*, Vit. C, E
Clif Shot (64g)	815	46	0	0	Ginseng

*Strawberry/ Banana variety only

Strategies to Enhance Fat Burning

© by Dr Peter Reaburn

Endurance training or racing uses both fat and carbohydrates as fuels. The harder we work, the more we use the carbo's. Unfortunately, we only have 60-90 minutes of carbo fuel stored in our muscles, liver and blood. Sure, eating and drinking carbo's can help us go longer but what if we could train or trick our bodies to use more fat. Wouldn't this allow us to train or race longer and harder on what carbo's we've got.

The purpose of this article is to examine the research on how we can trick or train our bodies to use more fat as a fuel, thus enhancing our endurance capacity.

Fat as a Fuel

We use carbohydrate (CHO), fat and to a lesser extent protein as a fuel during exercise. During exercise below 80% of maximum heart rate, we primarily use fat as a fuel. Once we start working harder, carbo's start to predominate as a fuel.

Fat has several advantages as a fuel:

- It is more energy dense than CHO
- Unlike CHO, it doesn't need water to be stored
- It can be stored in large amounts
- Uptake by muscles can be enhanced by caffeine

Regular endurance training, while lowering the amount of fat stored under the skin's surface, increases the amount of fat stored within muscles, making it more readily available as a fuel. However, to use fat as a fuel, for biochemical reasons we must have carbohydrate present. When carbo's run out, we "hit the wall" or "bonk"!!

Techniques to Improve Fat Usage

Because of our limited carbo supply, the more we can maximise fat usage during exercise the better. The techniques that theoretically might improve fat burning include:

1. Endurance training
2. Caffeine ingestion
3. L-Carnitine ingestion
4. Medium Chain Triglyceride Ingestion
5. Long Chain Triglyceride Ingestion
6. Injecting Fat
7. Fasting
8. High Fat Diet

Let's look at each one in turn

1. Endurance Training

Long slow distance training not only enhances the blood flow and uptake of fats as a fuel, it enhances the storage of fat within muscles as an immediate energy source not needed to be carried to the muscle. These factors will preserve the limited carbo store and thus prolong the time-period during which low or high intensity exercise can be performed.

2. Caffeine Ingestion

Caffeine enhances the release of fatty acids into the bloodstream from the stored fat under our skin and elsewhere, at least during rest. While some studies suggest that caffeine may inhibit the breakdown of fat during exercise, enhanced performance times have been shown to occur during long, slow exercise, possibly due to the stimulating effect of caffeine on the nervous system.

3. L-Carnitine Ingestion

Carnitine is naturally produced in the body by the liver, brain and kidney. It is also taken in when we eat red meat. After being formed in the liver or eating it, carnitine is released into the blood and taken up by muscles. Carnitine's prime function is to transfer long chain fatty acids into the aerobic energy-producing part of our muscle (mitochondria).

Many studies have shown that taking carnitine increases it's concentration within the blood BUT the all-important uptake by the muscles is NOT affected. This would suggest carnitine supplementation is just another marketer's picnic!

> "BECAUSE OF OUR LIMITED CARBO SUPPLY, THE MORE WE CAN MAXIMISE FAT USAGE DURING EXERCISE THE BETTER."

4. Medium Chain Triglyceride (MCT) Ingestion

MCT's contain fatty acids with a chain length of 6-10, they are very small in molecule size for ease of absorption, are relatively soluble, found as liquids at room temperature, and are emptied from the stomach very rapidly, in fact almost as fast as glucose. These characteristics make them attractive as a fuel during endurance exercise or as a pre-event meal to increase fat availability as a fuel and thus 'spare' carbohydrate.

A number of studies have examined the effect of pre-exercise MCT's on endurance performance. None have shown any benefit to either low or high intensity exercise of approximately one hours duration. In fact a number of the studies showed that taking in more than 30gms of MCT's an hour before exercise only leads to gut upsets!!

Taking MCT's during exercise has also been shown to have no effect on performance. While doses of MCT's greater than 30 grams per hour have been shown to minimally benefit 40k time trial performance in cyclists when the MCT's were added to a sports drink, such doses have also been shown to cause gut upsets that may impair performance.

5. Long Chain Triglyceride (LCT's) Ingestion

LCT's are a poor source of energy for muscles. While ingesting them before exercise raises the blood fatty acid levels like caffeine does, no benefit to carbo sparing or endurance performance has been observed in any study.

6. Injecting Fat

A number of studies have conclusively shown that injecting fat into the bloodstream or ingesting a fatty meal and then injecting with heparin as an anticoagulant may lead to enhanced performance and carbo-sparing in short-term endurance events such as 15-30 minute runs or cycles. Sounds attractive!! this possibility but the International Olympic Commission ban the practice.

7. Fasting

Studies on rats have shown improved endurance performance following fasting. However, in humans fasting decreases the amount of carbohydrate available to muscles and thus decreases performance.

8. High Fat Diet

Short term (<7days) exposure to a high fat diet significantly impairs performance. However, in some well-trained endurance athletes, it appears that longer term (>7 day) fat diets may prolong endurance time at low intensity. Furthermore, it appears that short or long term exposure to high fat diets does not alter the amount of carbo used in exercise, highlighting the need for carbo to be in the diet at all times.

In summary, while not conclusive, the research suggests that athletes involved in six-hour plus exercise might benefit from a high Carbo diet during training and a short term period of fat loading followed by a three-day carbo load leading into a race. This looks like the old carbo-load technique!!

From the Research

Vitamin C and 'Colds' in Athletes

A number of studies have observed increased incidence of respiratory infections in athletes that train hard. A recent Finnish study examined the influence of vitamin C supplementation in three groups of athletes - school children at an alpine skiing camp, soldiers training in the cold, and finally athletes in a 90 km running race. In each of the groups, a significant reduction in common cold incidence was observed in those that were supplemented with vitamin C (0.6-1.0g/day). The findings suggest that vitamin C supplementation may be useful in preventing upper respiratory infections in athletes under training stress.

Hemila, H. (1996) Vitamin C and common cold incidence: a review of studies with subjects under heavy physical stress. *Int. J. Sports Med.*, 17(5), 379-383

10 Things that MAKE an Athlete cont'd from page 1

7. Resilience.

I wrote an article a while back on psychological resilience and it certainly makes my Top-Ten list this time. An athlete must be able to bounce back from negative events in sport and life. Be it injury, illness or simply unexplained poor performance (NOT a simple matter at all!). The road is indeed long and the athlete must be able to display positive adaptive responses to the potholes that we encounter.

8. Life Balance.

Diversity is the key to a successful investment strategy. Similarly a well-rounded approach to sport and life will enhance, rather than detract from, the athletic experience. Do not be fooled by those who espouse an overly myopic focus on sport performance. Those who put all their eggs in one basket are sure to see them break at the most inopportune time.

9. Motivational Focus.

The challenge presented daily to the athlete is how to prepare to maximise one's potential. Over the long term the issue of ongoing preparation and training is a psychological, not a physiological issue. By focusing on the process of sport, rather than the product of sport the athlete will ensure long-term participation and performance. Sport is as much a journey as a destination, a colloquialism that I am sure I do not have to point out to a readership of masters athletes.

10. Social Support.

I have tried to include elements of biology, physiology, biomechanics, and psychology in the development of my ideal athlete, to this short list I add the social element. Family, friends, peers and competitors all contribute to the composition of the athlete. As much as we would like to attribute current high levels of athletic performance to the sport sciences the fact that someone raised the bar in the first place leads to succeeding high levels of performance by others. Acknowledge your competitors and what they bring out in you. Seek the support of family and friends in your sporting efforts. Without support from those close and important to you, you will face as big a challenge as does the disabled athlete lacking the so-called 'normal' physical attributes.

Kerry is a former elite Canadian swim coach and masters rower. He and his family recently moved to Rockhampton, Australia where he lecturers within the School of Health and Human Performance at the Central Qld University

Athlete Profile

Name: Don Bridges

Age: 69

Sports/Events: Rowing - Sculling
Occupation: **Past:** State Public Servant
Present: Retired
What do you enjoy about masters sport?
The opportunity to compete.
What motivates you to participate?
To put training to the test.
How do you keep yourself motivated?
Striving to maintain and improve fit ness, and improve sculling skills
Favourite training session:
5k handicap time trials
How often do you train?
5 to 6 days per week
Do you train under a coach, with a group of friends, or by yourself? Why?
90% by myself. Balance with a friend in double scull. Periodically row double scull with one of our clubs elite scullers.
Person most admired and why?:
Peter Antonie - brilliant sculler
Other interests/hobbies:
ballroom dancing
Your most memorable moment in sport:
Rowing in coxless four at FISA Masters in Cologne, Germany in 1992
Your most memorable moment in life so far:
My decision to return to rowing - scull ing after an absence of 40 years.
Favourite movie:
Sound of Music
Favourite book:
None in particular. However, I read what I can on the sport of rowing.
Favourite 'bad' foods:
I have none.
Favourite 'good' foods:
Fruit and vegetables
Philosophy on life:
Have a busy life style
Advice to masters athletes wanting to improve:
Actively involve yourself with the younger members of your club.

"What is the point in being trim, taut, terrific, but starving hungry and miserable?"

"Sports are full of things that can hurt you. Other competitors, for example."

"The road is populated by motorists who consider joggers to be targets of opportunity."

"When you attempt to lift heavy objects, your kidneys will try to leave."

MODE Nov. 1991

From the Research

Elite Triathlete's Diets Inadequate

Do triathletes in heavy training get enough energy, vitamins and minerals in their diet? Recent evidence from Ohio in the USA suggests not. Seven-day dietary records were evaluated in six elite triathletes (4M, 2F). Analysis of the diets suggested the average daily energy and carbohydrate intake to be insufficient to support the demands of training. The average vitamins and mineral intake exceeded the recommended dietary allowances except for both zinc and chromium which were less than 66% of the amounts recommended. The athletes were then placed on a commercial food supplement (*Reliv*) before and after daily training. Follow-up dietary analyses showed that energy and carbohydrate intake increased to meet demands as well as zinc and chromium levels achieving the recommended dosages. More importantly, short course triathlon performance improved significantly compared to pre-supplement performances.

Frentsos, J.A. & Baer, J.T. (1997) Increased energy and nutrient intake during training and competition improves elite triathletes' endurance performance. *Int. J. Sports Nutr.*, 7, 61-71.

Endurance Athlete's Semen

It's often been said in the ozzie press that the surflifesaving ironman guys appear to have more daughters than sons and perhaps it's the volume and intensity of training that may be effecting the guys. Recent evidence from Connecticut in USA might throw some light on this area. Three groups of men were studied - 11 high mileage runners (108±4.5 km/week, 9 moderate mileage runners (54.2±3.7 km/week, and 10 non-exercising controls of similar age (late 20's). Hormones (testosterone, luteinising hormone, prolactin, and follicle-stimulating hormone) and semen exams and sperm penetration of standard cervical mucus were examined. The levels of testosterone were significantly lower in the high mileage runners compared to both the moderate mileage guys and the non-athletes. Furthermore, the sperm count and sperm density were lower in the big mileage crew compared to the non-exercisers. The sperm were also less motile (active) than the moderate mileage guys and the non-athletes. Finally, the ability of the sperm to penetrate cervical mucus was decreased in the high-mileage runners compared to the non-exercisers. The researchers concluded that there appears to be a 'volume threshold' of endurance training above which there are significant affects on both hormone levels and sperm quality.

De Souza, M. (1994) Gonadal hormones and semen quality in male runners: a volume threshold effect of endurance training. *Int. J. Sports Med.*, 15(7), 383-391.

ROWING

Nutrition for Masters Rowers (Part Two)

© by Adair Ferguson, BSc, BA (Human Movement), MSc(qual)

Glycaemic index (TMA Issue 3 Oct 95), or GI seems to be all the rage in sports nutrition at the moment. GI indicates the rate at which carbohydrate from food enters the blood stream. Foods can be ranked by their GI—high GI foods cause a fast rise in blood sugar and low GI foods act over a longer time.

In general, low GI foods (e.g. porridge, baked beans, mixed grain toast) are better consumed before exercise for longer lasting energy while high GI foods (jelly beans, calrose rice, water melon) are thought to have a role in post-exercise recovery by maximising glycogen resynthesis.

Note that the prevailing GI 'wisdom' does not always correspond to the complex versus simple carbohydrate rules where complex carbs are eaten before exercise and simple carbs after. For example brown rice and potatoes, both classic complex carbohydrate foods, have very high GIs.

Lists of food with corresponding GIs are available, and it is worth having a look. Interestingly, parsnips have an extraordinarily high GI. **Jelly beans and jelly snakes are high, but chocolate is low.**

Some high GI foods for eating after training include cornflakes, rice bubbles and puffed wheat. Conversely, bran and mueslis are low GI foods. Pasta is low. Watermelon is high, while apples are low. Glucose and maltose are high while fructose is low. Milk products are low.

For masters rowers I think it is best not to get too obsessed with glycaemic index in foods. When making food choices the primary consideration should always be the highest nutritional value of the food with the least number of calories. (Down with quantity, up with quality!)

Choosing your food—two golden rules

1. **Choose a VARIETY of FRESH food.**

This is important because it helps ensure that you are getting the full range of vitamins and minerals that your body needs to function optimally. You can supplement your diet with these micronutrients, but it is extremely difficult to judge exactly how much of what vitamin or mineral you actually need. They often interact with each other, so going overboard with them all won't necessarily help either.

Eating fresh food helps ensure that you're getting plenty of fibre and keeping your salt intake down because most of the salt in our diet comes from processed food.

Practically speaking, to eat a variety of food you should break some of your eating habits. For example, as I advocated earlier, try eating as many different carbohydrates as possible—they don't end with bread and pasta. There are many other kinds of cereals/grains, all with slightly different nutrients, e.g. corn, oats, barley, rice, rye and triticale.

Many vegetables also have a high percentage of carbohydrates, as does fruit.

Eat as many different types of protein food as possible too, because each protein has its own combination of amino acids (although eggs are fairly complete). To get the full range of amino acids vary your protein source.

2. **Choose foods with as HIGH a NUTRITIONAL value as possible.**

This means thinking and learning about food, reading labels and knowing what you are eating.

For example choose a full grain variety of cereal wherever possible (e.g. in your breads, breakfast cereals, pasta). An occasional baguette won't hurt, but if you always choose white refined grains you will miss a major source of vitamin B, which is so important in energy production, and vitamin E, an important anti-oxidant and arguably beneficial to aerobic endurance. You'll be missing out on fibre as well.

Apply the same principles to the rest of your food. Add that extra egg into your cake or soup and you add a valuable complete protein and vitamins A, B and iron. Use vegetable juices instead of water for sauces or gravies and you'll get a whole lot more vitamins and minimal extra calories without even trying.

Nutrition in the life of the masters rower

Does our typical masters rower need to consider diet more than Joe Citizen? I think our masters rower needs the knowledge to discern which aspects of a sportsperson's diet pertain to them. I think the factors that should be considered are:

1. The caloric demands of the sport
2. Metabolic rate and aging
3. Recovery and aging.

1. Caloric demands of the sport

Many athletes, including masters athletes, think that because they are training and competing they have an excuse to eat anything they feel like and they will stay healthy and lean. This is simply not true, as we shall see.

Lets look at the event itself and at the type and duration of training. The race length for masters rowers is traditionally 1000 m (although this may soon be changed to 1500 m). This would usually take from 3 to 4 minutes, depending on the type of boat and the speed of the crew. It is possible to race 3 or 4 races in one regatta, so you would end up doing 12 to 15 mins of racing and maybe 60 mins of lighter rowing (warming up, paddling to start, warming down, etc).

Total energy expenditure would be a very approximate 3000 kilojoules for the regatta. You could consume this in one Musashi Amino Edge bar and a couple of pieces of fruit, or in one litre of most commercial sports drinks. (By the way, it's best to take in this food in small doses during the regatta, preferably immediately after each race).

For each training session you would need another 2000 or so kilojoules. So, it is apparent that the extra kilojoules necessary for the masters rower can easily be incorporated into a fairly standard diet. A few extra pieces of fruit, maybe a tub of low fat yoghurt and some raisin bread is quite enough to replace the energy used in training.

Many masters athletes are already carrying a few extra pounds which is another good

Continued on page 10

SWIMMING

Ten Open Water Swim Tips

© by Dr Peter Reaburn
AUSSI Masters National Coaching Panel

After many years of masters swim coaching and swimming, I was called back to my surflifesaving roots - open water swimming in the ocean. I was still able to enjoy the training and comraderie in training without the waiting around at meets for hours waiting for a 30-second dash.

Then again, maybe it was the fact that most swim meets are 50's and 100's. I'm not a sprinter, I know my endurance training and physiology is more suited to the long stuff. Open water suits me to a tee and offers a new challenge. Below are some tips gained from many years of surf swimming, open water swimming and triathlon team racing.

1. Know the Course and Rules

If a course map is available on the day, look at it and the course at the same time so you have the course clearly locked into your head (the shape, the buoy colours and shape, any useful landmarks, the style of finish). If the rules allow a wetsuit, use one. They are a HUGE advantage for all swimmers regardless of ability. Know exactly what wave you are in (cap colour, time of start, order of start, are slower swimmers in the earlier wave?) and plan your warm-up accordingly - it should be as close to the start as possible.

2. Know the Crucial Bits

The warm-up should be spent going over the course. Is the start deepwater or not. If not, walk slowly into the water to check depths and the bottom surface so you know when to duck dive or how hard to attack the water from the start. A potholed bottom can lead to some ungraceful falls for the unprepared.

Locate the landmarks you can swim towards instead of trying to find the typically small buoys that sometimes sit below chop or in the troughs of waves. This has particular relevance in finishing when you're tired and going for it. A tree or building behind the finish area is easier to see than a set of flags or gates when lifting the head quickly.

3. Holding the Line

Once in clean water, take the shortest route through the course - a straight line. Lifting the head every 10-20 strokes is the way to go in calm water or on the top of swells in the ocean. Lifting the head when starting to press on the strongest arm is the way to go. Lead swimmers, in general, are experienced and can be relied on to swim a straight line. If you're a "backadapacker", never rely on the person in front to hold the line. Lift the head, reorientate and go. Never stop dead - you'll lose momentum, waste energy getting going again and probably get hammered from behind.

Goggles are a habit. Personally, I never use them in open water swimming. They can fog up, they can get water in them, can fall off in waves, be kicked or pulled off in the start. All this upsets your vision and makes it hard to hold a line. No goggles, no worries. However, I hear some swimmers say they cannot do without them - your choice.

4. Start Smart

A good start is crucial. Positioning yourself at the front and side gives the strong swimmer a chance for clear water and the chance to lock onto another faster swimmer and draft, draft, draft. A front position for a weaker swimmer can be disastrous and dangerous with stronger swimmers going over the top of them. Weaker swimmers should be at the side of the start pack, around swimmers of equal ability or at the back of the pack. Allow for water movement (rips, sweeps) in the ocean by positioning in front of a rip or shallow bank and below or above the first turning buoy mark in the case of sweeps that run parallel to the beach.

"IF YOU'RE A 'BACKADAPACKER', NEVER RELY ON THE PERSON IN FRONT TO HOLD THE LINE. LIFT THE HEAD, REORIENTATE AND GO. NEVER STOP DEAD - YOU'LL LOSE MOMENTUM, WASTE ENERGY GETTING GOING AGAIN AND PROBABLY GET HAMMERED FROM BEHIND."

5. Start Aggressively

The first 50-100m are crucial. Sprint hard to gain clear water but not any longer than 30-45 seconds. The lactic acid build up in sprints longer than that will make life difficult later in the race. If caught in a pack, protect the face and goggles by swimming over peoples' legs with forearms - the water movement and pack will keep you moving forward till you get clear water.

6. Draft, Draft, Draft

The only way to go in open water swimming is at someone else's expense and ideally that someone else is a slightly stronger swimmer who you may know or have seen before, trained with, or raced against. Sitting 20 cms behind them is the way to go. Try and avoid touching them in case they get agro or lose their rhythm. Just sit there until it's time to pounce fresher in the last 50m.

7. Stay long and strong

Once in clear water and drafting, lock into the long and strong rhythm used in training. Stay focussed on "long and strong" - it's the most efficient way to go. Breathe every cycle - more air means more oxygen which means less lactic acid, less hurt and better pace.

8. Know the Finish

The finish is crucial. Know it, swim-walk it. What does it look like, where is the actual line, what do the officials want (wristband, number), is it a chute, a set of flags? When to stand-up? An old surflifesaving trick is to stand and wade or duck dive when your hand touches the bottom - a good tip that works.

9. Do the long sets

Anaerobic threshold (85-90% max heart rate) and intensive endurance (80-85% max heart rate) swim sets are the way to go for open water swims. They improve aerobic capacity, anaerobic threshold and economy at race pace. Examples are 10-30 x 100m on a 20-30 second recovery or 5-10 x 400m with 1 min between efforts.

10. Do the straight swims

Ideally open water swims should be done regularly in training. The ocean, a lake, a river make a great break from training. If unavailable, ensure you do the regular long straight swims (1-3k plus). These swims groove the long and strong technique, improve economy and teach the body to burn fat as a fuel more effectively.

Open water swimming is an art. Train endurance, know the course in your head, hammer the start, get clear water, stay long and strong, and draft, draft, draft. See you on the start line.

How to handle stress

- Use your Mastercard to pay your Visacard.
- When someone says "Have a nice day", tell them you have other plans.
- Start a nasty rumour and see if you recognise it when it gets back.
- Bill your doctor for the time you spent in his waiting room.
- Find out what a frog in a blender really looks like.
- Make a list of things you have already done.
- Put your toddlers clothes on backwards and send them off to pre-school as if nothing was wrong.

RUNNING

Marathon Training for Novices

by Dr Peter Reaburn

Adapted from an article in Research Quarterly, 65 (4): 339-346, 1994.

Thinking of running your first marathon but worried about not having the time to train. Wouldn't it be nice to be young again and not have those family and career commitments that seem to dominate our lives!? This article might give you some hope.

It summarises a research project that examined two groups of 21 year olds who trained for 15 weeks for a marathon. One group trained six days a week (6D) at between 65-75% of their heart rate reserve (max heart rate – resting heart rate) while the other group trained four days per week (4D) at the same intensity but covered 20% less distance than the 6D group.

What the previous Research says

Typical of sport science, there is little scientific data on marathon training for novices or elite runners. The popular press (Runner's World etc) have many articles that vary in terms of k's per day, total k's per week, training intensities and frequencies. However, there are some common elements found in most of the recommended training programs. These include:

- an emphasis on long slow distance (LSD), particularly for novices
- a long run a minimum of once/ ftn.
- a long run a maximum of once/week
- training at between 70-85% of the maximum heart rate

The problems

Novices and even those experienced and wiser athletes in search of the magical three hours or a PB, often try to train too aggressively, too quickly. This results in injury, lost motivation, and ultimately poor performance or overtraining.

The Purpose of the study

The researchers from the University of North Iowa set about trying to establish what was the minimal amount of training needed to allow a marathon to be completed. They set out to compare two marathon training programs that have unequal training k's and training days but used equivalent long runs.

The Subjects

There were initially 69 (28M, 41F) volunteer youngsters (21 years old) who ran no more than the equivalent of 1.6-8k's per week. Subjects were matched for gender and VO_2max and assigned to a six or four day per week group. After four weeks, 18 of the subjects had dropped out, six because of injuries, the others for various reasons. After week four, none dropped out.

The training program

Two phases were used in the project. Phase I was an unsupervised four-week period where subjects were all given a three-day per week walking/running program that ensured they could jog 30-minutes continuously by the end of week four.

Phase two was the fifteen week training program leading up to a marathon. The 6D group ran every day except Sunday which was a rest day. The total k's per week increased from 36k/week in week one to 77/week by week 13 when the taper began. The 4D group ran on Tuesday, Thursday and Saturday and one other day of choice except Sunday, the rest day. As with the 6D group, the total k's per week of the 4D group increased from 29k/week in week one to 62k/week by week 13 when the taper began. All subjects did the same long run on Saturdays beginning with a 55 minute run in week 1 and finishing with a 150 minute run in week 13.

The two week taper commenced in week 14 and 15 and saw a reduction in k's in both groups from 77 to 48 to 20 in the 6D group and from 62 to 37 to 20 in the 4D group.

Run intensity was monitored using heart rates at between 60 and 75% of heart rate reserve (65-80% maximum heart rate).

The Results

Both groups and both sexes significantly decreased their body fat and maximum heart rate as well as increasing their muscle mass and VO_2max (up to 13%). Both the 6D and 4D group and both males and females decreased the amount of oxygen needed to maintain a particular speed (economy), and had both a lower lactate level and heart rate at a submaximal speed.

The following results were recorded:

Most importantly, all subject completed the marathon. There were no differences in marathon performance between the 6D and 4D group. This result strongly supports the commonly-held belief that the once per week long run done by both the groups in the study is a critical factor in marathon training.

	6D group (min)	4D group (min)
Male	246.8±15.1	258.7±23.4
Female	291.3±31.9	290.9±42.2

Conclusion

While the results from this study are from a younger group, the concept of improved aerobic capacity, decreased body fat and improvements in economy as measured by lower heart rates, lactates and oxygen cost, are typical of most endurance training studies done on old or young, male or female, and any group - as long as the training program progressively increases distance, subjects train a minimum of three times per week, and exercise at an intensity above 60-65% of maximum heart rate for a minimum of thirty minutes continuously.

The crucial element from the study reported is that a busy schedule does not preclude completion of any long duration event, as long as one long training session is undertaken in a week.

What's Hot

Steroids

For many years, power sports have had the stench of steroids wafting around. Recently the sport of Rugby League has been tainted by steroids and drugs that either enhance the natural production of steroids or mask their presence. Let's take a quick look at why athletes getting paid big bucks for success are tempted to step over the line.

What are steroids?

Testosterone is a naturally-produced male hormone produced by the testes of men and in much smaller amounts by the ovaries of women. It has two major functions — an anabolic (tissue size building) one as well as an androgenic (masculinising) function. Scientists can now synthetically produce steroids that maximise the size building but minimise the masculinising. Originally developed to minimise muscle loss in hospital patients who lose muscle when confined to bed for months, it was realised it might enhance performance by increasing muscle mass and thus strength in power athletes.

The benefits of steroids

- Increased muscle size
- Decreased fat mass
- As a result, increased muscle strength
- Increased recovery rates from quality training
- Increased recovery rates from injuries
- Increased tolerance to intense training

The negative side-effects

In females:

- Development of body hair
- Clitoral enlargening
- Menstrual disruption
- Deeper voices
- Increased sebaceous gland activity - acne

In males:

- Decreased testicle size
- Decreased sperm count
- Breast development — "bitch tits"
- Liver dysfunction
- Mood changes — "roid rage"
- Prostate enlargement

In both genders, the following can also be seen in chronic steroid users:

- Decreased heart muscle size
- Decrease in HDL cholesterol - the 'good' cholesterol
- Increased risk of cancer
- Increased risk of cardiovascular disease

A quick ramble through the physiological effects of steroids without any discussion on the sociological issues which are numerous — setting bad examples for young athletes, the pressures of elite sport, the quest for gold, everyone else is using them etc. However, for me, it boils down to one factor only — it's cheating!

CYCLING

Flexibility for Cycling

© by Ivan Hooper

It has long been accepted as par for the course, that a good warm-up is wise before undertaking any form of exercise or strenuous activity. Many of us however, neglect the stretching component of a warm-up, or don't adapt it to match the activity we are about to undertake.

Cycling is a great form of low impact exercise, that can help improve and maintain cardiovascular fitness and muscular endurance. Flexibility should be an essential component to all cyclists' routines. Below, the value of a cycling specific and regular stretching program is considered.

Why Stretch?

Cyclists that regularly stretch as part of their training program, not only reduce their risk of injury, but also more effectively prepare themselves for optimal performance in both training and competition. Flexible muscles and joints, warmed by specific and appropriate stretching, respond better to training, and resist injury more effectively than tight, stiff muscles and joints left "cold" before undertaking exercise.

Few would dispute, that cycling performance is closely influenced by the position adopted on the bike, joint positions determining mechanical efficiency. Consequently flexibility training, in conjunction with other static bike set-up features, such as saddle height and stem length, can be important in achieving the ideal position, and ensuring the most effective use of effort. Muscle, joint or neural (nerve) tightness in key areas such as the lumbar spine, hips and hamstrings can therefore significantly alter a cyclist's posture on the bike. In more event specific terms, calf length is essential to those cyclists involved in time-trialling or triathlons, to obtain the correct pedalling action.

Before muscles can create movement of body segments, they must first overcome the body's internal resistance. This resistance is created by movement of the muscles, fascia, neural tissues and joint surfaces both within and between each other. The higher the internal resistance that must be overcome, the harder the muscle has to work before effort is exerted on the external environment. Correct warm-up can reduce these internal resistances, and therefore make an athlete's effort more productive. Flexibility therefore, not only assists in avoiding injury, but also enhances performance on the bike.

Who Should Stretch?

Everyone needs to perform some form of frequent stretching program. Failure to stretch regularly is the greatest cause of loss of flexibility, but increasing age and decreased activity levels, including the rest associated with recovery from injury, can also lead to reduction in flexibility. With these factors in mind, one can see how the need for stretching can be even greater for the masters athlete. Cycling in particular, requires joints and muscles associated with the hip and knee to move through ranges that would not regularly be used in our day to day routines. Therefore, these joints and muscles need to be regularly stretched to prevent any loss of movement or length.

Principles of Stretching

The basic principles of stretching are:

- warm up prior to stretching
- stretch before and after exercise if possible
- stretch gently and slowly
- stretch to the point of tension but never cause pain

The tendency to stretch harder than necessary should be avoided. Stretching into pain can result in microscopic damage in the muscle that leads to scar tissue formation. This scar tissue is less flexible than muscle, which actually reduces flexibility and can increase the risk of injury.

How to Stretch

Many cyclists train early in the morning, and are often restricted in the time they have to complete their training before rushing off to work. This fact was confirmed by discussions with several cyclist and their coaches, who reported that spending the extra time stretching before training is difficult. One possible alternative to this may be to spend time stretching later in the day. Time can be set aside in the afternoon or evening to go through the suggested stretches to ensure that muscle length is maintained. It should not be forgotten however, that stretching does reduce risk of injury, and so pre-training stretching of key muscle groups is still very important.

Prior to a stretching session, athletes should perform an easy warm-up of 5 minutes on the wind trainer or jogging. This should bring the cyclist to the point of a light sweat, an indication that the body is beginning to warm up. Once warm, a series of stretches such as the ones illustrated should be completed. To complete the series of stretches suggested in this article, will take approximately 20mins. Stretches should be performed in a slow careful manner, without pain, the position of stretch being maintained for a minimum of 15-20 seconds per stretch. Each stretch should be repeated three times per body part. Normal breathing should be maintained during all stretching, the stretch being stopped if pain rather than tightness is encountered.

Stretching as part of the (often forgotten) warm-up is also very important, the same routine of stretches being appropriate. This ensures maintenance of the length of muscles utilised during the session, and also enhances recovery after a hard training session.

Factors such as age, general conditioning or previous injury mean some people will require more frequent or lengthy stretching than others. If in doubt, it doesn't hurt to repeat a stretch, but over stretching should be avoided. Stretching of known tight and stiff areas on rest days from training will improve flexibility more quickly. A good rule of thumb, is to perform a few stretches often, being sure that all essential groups are considered regularly.

Areas to Focus on

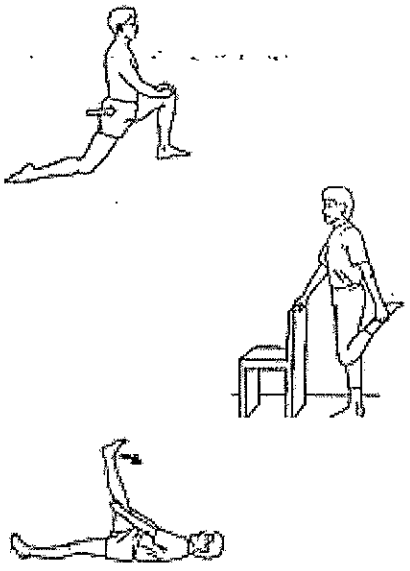
In any stretching program designed for a cyclist, it is important to focus on the areas that are most commonly injured during cycling, as well as the areas crucial to good performance. These key areas are the :

- lower back and gluteals
- hip flexors
- quadriceps
- hamstrings and the associated neural tissues
- calf and ankle

Remember

Each person has, amongst other factors, specific requirements depending on individual flexibility, the number and intensity of training sessions performed, and past injuries experienced. The above is a general guideline only. If you have any doubt about your flexibility program, or lack there of, or have an existing injury, please consult your local physiotherapist, who will help you get pedalling in the right direction.

Stretches appropriate and specific for cyclists.



Continued on page 11

Rowing continued from page 6

reason to make sure that you do not consume vast amounts of kilojoules. You can still eat as much as you want without taking in excessive calories, if you choose foods which aren't energy dense. So (again!) keep away from simple sugars and fats.

2. Metabolic rate and aging

As people get older, especially after forty or fifty, it's a sad fact that they need fewer kilojoules to sustain basic metabolic processes. This is largely due to the lower proportion of muscle tissue to fat, but also because they are no longer growing. If you are losing muscle tissue as you age then you won't need as much energy. Athletes who can maintain their training consistently through their lives may prove the exception to this, but the trend is that as you age your basic metabolic rate is less.

3. Recovery and aging

Recovery becomes critical as you get a bit older, mainly because recovery gets harder, and with other aspects of your life to consider, there is not as much time to sleep or relax during the day. Timing your meals for optimal glycogen repletion is therefore very important, and we'll go into this in the next section.

Ensuring adequate fluid replenishment is also an integral part of efficient recovery. To do this you have to make drinking a habit, and that's water not alcohol (which is a diuretic, as are coffee and tea).

As with planning your meals and taking food with you to regattas and training, always take your trusty water bottle. Water is usually good enough, but if sessions are over 90 minutes or very intense a diluted glucose polymer sports drink such as Energise or Maxim might assist recovery. If it's very hot and you've sweated over 3 kg then you might consider an electrolyte replacement sports drink such as Staminade or Lucozade. Many of the commercial sports drinks have very concentrated amounts of sugar and salts and you may find it preferable to dilute them to avoid an upset stomach.

One word of warning about sports drinks: Never try a new sports drink during competition—you never know how you will react to it. I learned this lesson the hard way while at the 1994 Commonwealth Regatta in Canada. I found myself quite dehydrated, but without my water bottle and (can you believe it?) there was no drinking water on site except for a sponsor's sugary and salty sports drink. I never use electrolyte bolstered drinks and the effects of this one on me were a surprise to say the least. I got severe cramps during the race in my calves (of all things) and limped home a very embarrassing second last.

It is important to note that injuries can occur more readily in a dehydrated body, especially in joints which rely on fluid-filled sacs for lubrication. Dehydration also seems to predispose tendons to injury, as I have found out, to my personal cost.

Food has fluid in it, and if you aren't eating much, you need to drink more to compensate. Conversely some foods will help to rehydrate you—watermelon is a very good recovery food.

After long and intense training sessions when you are low on glycogen you have to dip into your muscle tissue to provide energy. Protein intake then becomes a more important part in recovery. It is now known that endurance athletes who train over long durations may need up to twice as much protein as recommended for a standard sports diet. Usually, consuming this amount of protein isn't a problem as the total amount of food intake increases so does protein intake. However it is worth making an effort to think of including a little protein in your post-exercise replenishment routine, preferably after that first hit with the high glycaemic index carbos.

Recovery isn't only a matter of refilling those energy stores. Damage is often done to muscle tissues, as well as to tendons and ligaments, and stress fractures can occur from overuse. Can diet influence recovery from injury? According to conventional wisdom no, but when you're injured you can get desperate.

"AS PEOPLE GET OLDER, ESPECIALLY AFTER FORTY OR FIFTY, IT'S A SAD FACT THAT THEY NEED FEWER KILOJOULES TO SUSTAIN BASIC METABOLIC PROCESSES. THIS IS LARGELY DUE TO THE LOWER PROPORTION OF MUSCLE TISSUE TO FAT, BUT ALSO BECAUSE THEY ARE NO LONGER GROWING."

Not so long ago I was sidelined with a broken scapula and vertebrae after a cycling accident. I had 7 weeks to get fit for the world championships, and I couldn't row because I couldn't use my upper body. I could use the exercise bike at the gym, however, I could go to 'spinning' classes, and I could use the leg press. I tried every vitamin pill I thought might give me a chance to hasten the healing process. These were Vitamin E, Vitamin A, Vitamin C with bioflavinoids, and calcium. I also made sure my protein intake was adequate, which was especially important as I was on a very low kilojoule intake trying to lose weight to make the lightweight category. I eventually passed the fitness test to make it to the world championships (but then got pneumonia while there and couldn't race!). Did the extra vitamins, minerals and protein have a hand in my recovery? Who can say? At least they didn't do any harm!

Fitting eating into the masters rower's day

Before early morning training

Early morning rowers should try to eat a little something before training, even if that's at 5 o'clock in the morning. Blood sugar is very low in the morning and you may very well go a bit hypoglycaemic (lack of blood sugar) if you train without eating. This food should have a fairly low glycaemic index and it will be absorbed more slowly, allowing for the energy to last for the whole training session. These foods are often high in fibre, however, so be careful not to eat too much or you may feel sick in the stomach when you're out there on the water.

After training

Studies have consistently shown that it is essential to replenish your glycogen as soon after training/racing as possible. The best way to do this is to consume some carbohydrate-rich food of high GI within 10 minutes of training. A sports drink might be useful here, or choose real foods with a high GI such as rice, processed cereals or plain bread without grains and seeds. Don't forget that fluid replenishment either.

Some fruit is good at this stage—watermelon and pineapple have the highest GIs and also help fluid replenishment.

Breakfast

Breakfast should be within an hour or so after the glycogen replenishment. It should still be mainly carbo rich foods, but here you can include a greater variety of cereals and fruit, and even a little protein.

Be more careful about the nutritional value of your food at this stage. You are looking for a longer-lasting meal now. Cereals should preferably be of the unprocessed variety (porridge, puffed wheat, rice, natural muesli), or at least avoid the processed cereals that are high in salt or sugar. Avoid toasted mueslis and muesli bars—in addition to vast amounts of sugar, both can contain up to 20 grams of fat per 100 grams which is actually about 35% of the total energy value of the food. (When reading food labels an easy way to estimate the percentage fat in the food is to double the fat content given in grams per 100 grams).

Really try to get into the habit of using low fat high calcium milk if you haven't already—full cream milk is such an easy way to take fats in without really noticing it.

The rest of the day

By lunchtime you can include a bit more protein and a little fat. In effect, you're back to 'normal' food: a chicken and salad sandwich for lunch, for example, is fine.

Dinner can also be relatively 'normal', as long as you follow the principles of good nutrition outlined in this article (low fat, low salt, less quantity, more quality).

If you are training very intensely, or training again later in the day, have some more carbos with your lunch and a snack in the afternoon. If not, you don't have to keep eating heavily all day.

To keep your weight down it's better to have most of your kilojoules in the first part of the day, which is one of the reasons why I have emphasised the early morning and breakfast intakes.

As a general principle eating smaller meals more often is better, for several reasons:

1. You don't get large highs and lows in blood sugar (so your moods and energy levels stay even, and you don't yawn during that important meeting! You also minimise stress on your insulin system)
2. By eating a small amount of food quickly after training and you have more chance of getting more carbohydrates into your glycogen stores, which will means the stores will be recovered for the next day's training.

Continued on page 12

TRIATHLON

Triathlon and Strength Training

© by Dr Brendan Humphries

The three basic elements of fitness include strength, speed and endurance. Many triathletes already dedicate a majority of their aerobic training program to their three disciplines of swimming, cycling and running, but gradually more are searching for that something extra to improve their competitive performance.

Those triathletes that have found renewed success in training and competition are adding strength training to their aerobic training program.

Strength Training ?

With the increased popularity of triathlons there has been more attention devoted to understanding the prospect of concurrent training techniques (*strength and endurance*) or multi sport-specific training. To date much research has gravitated towards the extremes of the training continuum trying to link maximal strength training with improved endurance performance, further separating these two modes of training. Under these circumstances the researchers are probably right in suggesting that there is no improvement in endurance performance since maximal strength training incorporates few repetitions and concentrates on producing near maximal forces to improve anaerobic work. Trying to match these two different types of training are destined to have little or no impact upon each other. However, there is a place for strength training in the triathletes training program to:

- Increase muscle strength which will lead to an increase in speed and efficiency of those muscles
- Increase muscle strength to allow individuals to utilise a smaller percentage of their maximal strength
- Increase intramuscular stores of energy thereby delaying the onset of fatigue
- To help recover any strength losses sustained during the competitive season (*this would typically occur during the off-season*)
- To prevent overuse injuries *(40-90% athletes suffer common injuries to the lower leg, ankle, knee or back)*
- Reduce the incidence of acute injuries *(by improving bone strength, connective tissue and increasing ROM)* associated with endurance programs
- Allow primary muscle groups to recuperate
- To balance muscle groups that are predominately used during endurance training (*this will help reduce the incidence of injury*)
- Maintain high metabolic levels that will increase lean body mass and decrease fat weight (*a benefit to any athlete*)

Ultimately, the importance of strength training for the triathlete resides in the fact that a stronger muscle will have:

- A greater endurance compared to a weaker muscle,
- Utilises a smaller percentage of its maximal strength; and
- Delays the onset of fatigue.

Guidelines for Strength Training the Triathlete

The triathlete and endurance athlete must follow a completely different set of guidelines from those athletes competing in strength and power dominated sports. When combining strength and endurance training within the same program athletes, coaches and trainers must be aware that adding extra training sessions to an already busy training schedule requires a reduction in one of the other training modalities before benefits can be realised. Before embarking into the weights room the following general strength training guidelines need to be considered:

- Train at a level to improve specific muscular strength that will allow the athlete to increase their muscular endurance (*don't train with weights that you can lift only once or twice you should be able to lift the weights for about ten lifts and you should train to always increase these weights*)
- Focus on prime movers (*the larger muscles doing the work*)
- Use multijoint exercises (*similar to running, swimmimg and cycling actions*)
- Mimic the angles of the sport as closely as possible (*eg. if a cyclists feet are only 20 cm apart and they only use a slight bend at the knee then train in a similar way*)
- Always include abdominal work – (*core stability is important to all athletes as it provides the athlete with good posture to compete eg. there is no use entering the final run leg of a triathlon if you are stooped over and can not get air into your lungs*)
- Periodise strength training – progress from off-season (injury prevention), base training, pre-season and competitive season (maintenance)
- Keep the number of exercises low
- Recognise and focus on improving an athletes weakness during the training program

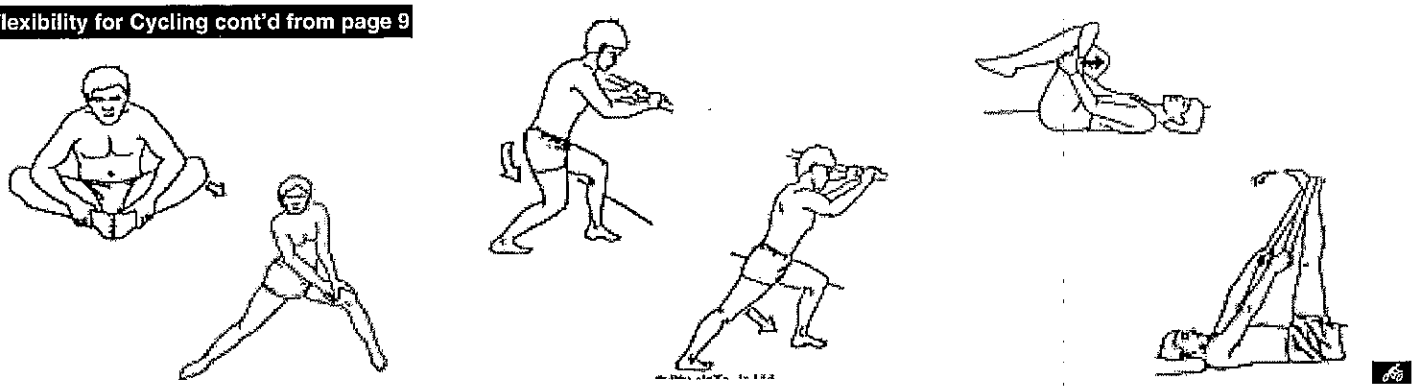
Strength Training is Not Limited to Lifting Weights ?

Many triathletes and endurance athletes complain that weight training is boring, not specific to their needs and requires a lot of effort for very little gain in return. What these athletes have failed to recognise is that strength training does not have to be relegated to lifting at the local gym. A good strength program should include exercises that are not only muscle specific but are also action specific to the athlete. Action specific exercises should be included in the muscle specific training program such that when performing strength training sessions the athlete could spend half the training session in the gym and the other half out of the gym on exercises that can improve those muscles used during performance. These sessions may include

1. **Strength Training for the Bike**
   - heavy chain ring cycling up steep hill - develop specific muscle strength of the quadriceps, hamstrings and gluteals
   - Use heavy resistance (*loading*) on the cycle ergometer (or similar) to create overload in the muscle. *eg. 30 secs heavy followed by a recovery of 1 or 2 minutes at a light load.*
2. **Strength Training for the Run**
   - Low impact plyometric bounds to improve leg strength and speed
   - Running with the added drag of a

Continued on page 12

Flexibility for Cycling cont'd from page 9



Triathlon continued from Page 11

chute to overload the legs

- Note: Running tightens hamstrings - stretching/flexibility a major concern

3. **Strength Training for the Swim**

- Biokinetic swim bench
- Swimming against a current (*always swim with a spotter for this one*)
- In water devices (hand paddles, hydro-chutes, rubber bands, etc)
- Tethered swimming

Conclusion

Strength training is an essential ingredient to a triathlete or endurance athletes training program irrespective of age or ability. The gains may not always be apparent but the work you put in to strengthen your muscles will be rewarded with improved performances and injury free participation in your chosen sport. Strength training for older athletes becomes even more important as it helps maintain the muscular strength that decreases as a consequence of age, however, caution should be practiced. It is recommended that the older athlete be cleared by a physician before entering a strength training program and that they seek the advice of a strength specialist to maximise their training potential.

Rowing continued from page 10

3. If you are going to train again later in the day, even if only moderately, your stomach will not be uncomfortably full.

Fitting eating into regattas follows similar principles

A warning about energy drinks, fruit juices and energy bars. Energy drinks, fruit juice and energy bars are easy ways to consume a lot of kilojoules without realising it. These foods should be kept for specific times when they are necessary and useful, e.g. during regattas when you haven't the time between events to eat a meal or on long training rows (over 90 minutes) It should be remembered that this is food and part of your daily energy consumption. If you are using energy/sports drinks as a major part of your total caloric intake then make sure you have chosen some with added nutrients if they are meal replacements. Sugary sports drinks with no nutrients are okay for straight after a training session or race, but are otherwise not a good thing.

Conclusion

I have rambled over all sorts of things in this article, yet I feel I have barely got started. For example, I haven't even begun to cover osteoporosis, the pluses and minuses of caffeine, differentiating between sports drinks and supplements, sodium bicarbonate loading, creatine monohydrate or how to cope with decadence and appear normal. Maybe another time.Coming up with a conclusion is not easy, but I guess my overall message for masters rowers is the one I started out with—**decrease the quantity** of food being eaten, **increase the quality**, and time it right!

Two useful books - Louise Burke's *The Complete Guide to Food for Sports Performance* (Burke/Allen & Unwin 1992) If you are more serious about the whole food scene in Australia, a very useful book (that is currently on special) is the Australian Institute of Health and Welfare's *Australia's Food and Nutrition* (author Ian Lester, published by the Australian Government Publishing Service 1994). Alternatively, surf into the full text for free at http://www.aihw.gov.au.

Adair Ferguson is a former World Lightweight Single Sculling Champion, Commonwealth Games gold medallist, and many time national champion. She is currently Sports Development Officer for ACT Rowing