

STROKEARCS

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TECHNIQUE

SOME ADVANTAGES OF A LONG CATCH

“Keep your length!” “Don’t shorten your stroke!” Who among the athlete community hasn’t heard a coach yell something much this just when you’re busting your guts to finish in a sprint. Who among the coaching community hasn’t used something very much like these phrases in advising a crew about tactics associated with finishing bursts in a race plan?

Why is it so important? Why do the big, long, tall people make boats go faster than more “normal” sized people? Here are some of the reasons (not all, because I don’t know them all) – most are straightforward, some may require some thinking to “get”.

Distance Covered Per Stroke:

That’s fairly straightforward – the farther forward¹ you reach, the more of the rowing course your blades bite off with each stroke, and the fewer strokes you need to take to get to the finish line. But that’s not all.

Easier Catch Timing and Less Missed Water:

We all love to see a well-timed catch where the crew misses the smallest amount of water at the entry. Many (very many) have written eloquent descriptions of how to do this (Fairbairn, Bourne, Herberger, to name a few – heck, even I’ve had a go at this). Kleshnev wrote about this in the Rowing Biomechanics Newsletter 2007 issue 3, and 2007 issue 5. The farther you reach around to the catch, the easier it is to “match the speed of the water” with your blade, although I’m not certain if that’s exactly what we’re trying to do. We are, generally, trying to move a boat that’s in motion past stationary water (even in rowing in a current, the water is essentially stationary relative to the boat unless a blade catches an eddy). The steeper the angle of attack (the closer the blade is to parallel to the boat), the easier it is to put the blade into the water without having to accelerate it towards the stern in order to match and then exceed the speed difference between the water and the blade (in the direction of travel for the blade – remember that the blade is travelling in an arc, “away from” the boat after the catch). I.e., If you are trying to catch with the oar perpendicular to the boat, and you are travelling towards



the finish line at (say) 4 m/s, to achieve any acceleration of the boat, you have to very quickly get the blade of the oar to exceed the 4 m/s that the shell is travelling, so that you can increase the propulsion on the boat. If you’re catching parallel to the boat, (nobody does), you can place the blade into water that (relative to the movement of the blade) is moving at zero velocity.. Of course, the blade is moving at the same speed as the boat at that time, but in the direction of the blade’s travel when you push the stretcher (away from the boat) the water/blade velocity relationship is zero. The difficulty with changing your blade’s direction of travel to have a quick catch at 90o is that thing from Isaac Newton – the “Action-Reaction” law – to make the oar change direction and bite the water, a person needs to have a platform on which to create the movement – you have to push on the boat to make the oar change direction. This will cause a check... If you review the velocity profiles in the momentum article also on this site, you’ll see that even with a well timed catch (you’ll have to take my word for it, the film from which this was generated may still exist, but if so, it’s in either Vancouver or Ottawa) there is a significant drop in the boat velocity at the catch (but it is still well above zero velocity – it just looks to us in the coach boat like it goes backwards because we’re usually matching the average velocity of the shell). Nobody can row or scull without this occurring unless we can have continuous propulsion.

When you reach longer, and your blade is entering the water at an angle of greater than 75 degrees (in a sculling boat) forward of perpendicular (or within 15 degrees of parallel to the centerline of the boat) you don’t need to be as quick in pressure application to start applying propulsive pressure to the water/blade interaction. This shouldn’t be construed as permission to get on the work slowly, you still need to be pushing the footstretcher and hanging on to the handles right away after (or as?) your blades enter. Some people (well, most) think it ineffective to push outwards on the water, and that the “effective” part of the stroke is that short little 40 degrees of the stroke on either side of perpendicular. It’s not – if it were, why do really tall people, who go fast in a sculling boat, scull with catches between 75 and 80 degrees around from perpendicular to the boat? Later in this paper, with more segments of the discussion out of the way, we should have a better understanding of why it is more effective (in a fast moving boat) to catch long, almost parallel to the boat. “Pinching” a boat is a myth, unless the boat is so mushy that you wouldn’t race it in the first place.

Blades move in the direction of travel, early in the stroke
If you were brave enough to put your blades into the water parallel to the centreline of the boat, the tips of the oars would be moving towards the finish line at the same

speed as the boat. During the recovery, the blades move faster than the boat because they are being carried forward towards the finish line by the boat as the crew moves the handles aft during the recovery. In a real catch, which is shorter than parallel to the boat, someone who is good with trigonometry and has access to overhead video of a crew can probably calculate the angular velocity of the blade at various parts of the movement.

The closest I've seen anyone to catching parallel to the boat has been an overhead photo of Pertti Karppinen, from Finland, who won the 1976, 1980, and 1984 Olympic single sculls gold medals, and was reaching around to about 80 degrees (i.e., 10 degrees short of the parallel, if "0" is perpendicular to the boat.) Volker Nolte uses this photo in his presentations about rigging. The photo is printed at the right, with Volker's permission. (This doesn't mean that Mahé Drysdale, Nathan Cohen, Storm Uru, Marcel

Hacker, Olaf Tufte or any of the current crop of elite scullers don't reach that far, it means I don't have a photo of them.) In the above picture, the angle included by both sculls is about 40.6 degrees (that's using a bit of trigonometry). For the sake of discussion, I'll assume that the blades are at the same angle around from centreline (they're not exactly, but close enough for these purposes), or – each blade is about 80.3 degrees around towards parallel to the boat.

After the blades are in the water – please recall that you're trying to move your boat past the blades, not pull the blades past you – the blades still slide through the water towards the finish line immediately after entry. The amount they slide through the water in this direction depends a bit on how hard the athlete's drive is, a bit on the overall reach at the catch, and a bit on the "instantaneous" angle of the oar relative to the boat. In sculling this effect is greater than in rowing because of the greater angles involved.

Pushing outward on the water early in the drive is GOOD to do.

What? With the blades of a sculling boat "locked" in at the catch, and with the sculler loading up the oarhandles by pushing the foot-stretcher/rigger hard against the button/wear plate, the sculler pushes hard against the water in which the blade is sliding lengthwise, in the direction of the tip of the blade. If you think of this from an "instantaneous" perspective, say at 0.111 second after the catch, and then again at 0.112 second, and again at 0.113 second, the blade is moving through the water following the tip of the blade, and the force acting on the water is perpendicular to the face of the blade. The force

acting on the water is usually resolved by biomechanists into the "effective" vector – opposite to the direction of travel, and the "ineffective" vector – perpendicular to the boat. This requires a re-think – a serious re-think – well, I think so, anyway.

Action-Reaction and a wet bar of soap.

When the blades are pushing outwards on the water, a kinetics specialist would say that the water is pushing inwards on the blade. If you are very long as in the photo above, and consider the time between (oh, say) .111 and .112 seconds after the entry (1/1000 s. difference in time, not much movement has happened), the forces going outwards generated by the rower are mostly countered by the forces going inwards in reaction, there is very little actual outward motion of the blades, and relatively more forward (towards the finish line) motion of the blades. If you do a small mental flip and consider that the rower is resisting outwards while the blades are being pushed inwards by the water, you can imagine a wet bar of soap, being squeezed, and squirting out of the hand.

The boat/oars/sculler is the bar of soap, in a way, and the reaction force of the water causes the boat to "squirt" forward as the blades slide through the water. This effect becomes reduced as the blade angles get farther and farther through the stroke, and as the blade tips get farther and farther away from the boat.

Only works at "pace".

This "instantaneous reaction force" effect of a long catch works only after the boat is



moving – you need to start with shorter strokes, or there is not enough movement along the length of the scull with which to take advantage of the length and the "bar of soap" analogy. Lift along the surface of the blade is also a phenomenon that is a complex bit of fluid dynamics, but the important bit at the very long part of the stroke, when the blade is pushing outwards, is proposed by me to be the reaction force from the water acting on the blade – the blades don't move outwards very much during the first moments of the drive, but the rower/boat motion system sure picks up speed. If this "squirting" or "bar of soap" action was not in effect, we should be able to encourage scullers to rig so that they can row short at the catch. I think that the "lift" that has been much discussed in some circles of late helps the athlete feel well anchored in the water.

Where did I come up with this?

In 2004? 2003? – whenever it was that the Rowing Canada National Coaches Conference was in Richmond, BC, Volker Nolte did a bit of a wrapping-up discussion of the dynamics of the blade in the water. In that discussion, he discussed the path of the blade in the water having

three phases – Phase 1 is the early part, where most of the motion of the blade (in addition to angular motion) is along its length, and about which there has been much discussion of “lift”.

Phase 2 is the part in the range that has been historically described as the “efficient” range, where the blade is mainly pushing aft on the water. Phase three is where the tip is coming back towards the boat and the athlete has to think very hard about getting the blade out of the water. The discussion about the “bar of soap” action is almost entirely related to Phase 1. Volker contrasted the sculling/rowing race start against the speed skating race start. We take shorter strokes to remain a bit more stable and to get the boat going, reaching farther and farther around, and eventually pressing outwards on the water in Phase 1. The speed skater starts the race by running on the ice with the skate blades pushing backwards, and as he/she picks up speed, the skater then gets into a streamlined position and is coached to push outwards on the skate. The marks made on the ice by the pushing blade are very similar to the path of the blade tip in a very long sculling stroke in Phase 1. (The similarity doesn't end there; the skater is actually gliding and pushing on water, due to the pressure from the narrow blade melting a very thin layer of ice.)

This writer is aware of one elite sculler (not from Kiwi land) who, upon seeing the overhead video of the catch length, re-rigged the boat so that the catch would be shorter, and subsequently slowed down enough to go from being a serious contender for Gold, to struggling for a medal. I know that this isn't the best description, and that a currently practicing biomechanics professional would likely shudder at my phraseology, but, having looked at this stuff long and hard, I think this is a valid description of what's going on. (As well – what's a Coach Development Manager supposed to do other than stir up thought and discussion?)



his sixth consecutive World Championships title in 1997 in Athens—certainly one of the greatest accomplishments in the history of the sport. He has also set 17 world records outdoors and 10 indoors. He has cleared 6.00m or better in more than 44 competitions. He was voted Sportsman of the Year for 1997 by the influential newspaper L'Equipe and honored as the best pole vaulter of the last half century by Track & Field News.

INTRODUCTION

Bubka describes his childhood and his early love for sport. His ferocious competitive spirit was channelled into many sports until, at age 10, he came under the influence of the pole vault coach Vitaliy Petrov. Bubka describes the special qualities and methods of a man he acknowledges is the best technical coach in the world and introduces the concept of The Culture of Movement.

The influence of gymnastics on Bubka's technique is described, as is the importance of communication, feedback, and keeping an open mind to outside influences— especially from specialists in weight lifting, sprinting, medicine and psychology. Bubka's meticulous approach to training and competition is described. Maintaining a distance from distractions, especially before major events, is vital. This can sometimes be misinterpreted. Bubka describes the last 18 months which have seen him recover from a serious achilles injury. An operation was eventually required. Athens 97 was a great motivation and Bubka describes how he was able to come back, and how he is still keen to make more world record attempts. Commercialism must be secondary to performance ambitions. Limits must not be part of an athlete's vocabulary. Above all must be dedication, attention to detail and love for the Spirit of Sport.

I will start this speech with a confession. I have won gold medals in six world championships but I have never felt more nervous than I do here today! But although I am not used to speaking at this type of seminar I am happy to have the chance and I hope you will be interested in what I have to say.

First of all, I would like to talk a little about my childhood, because it is here that you will find the essence of the athlete I would become. I was born and brought up in the town of Lugansk in what was then the USSR and would become Ukraine. My father was a soldier and my mother a medical assistant. But they weren't active in sport.

My interest in sport came from playing in the streets around my home with my brother and my friends. As a boy I loved to play all sports. But what I loved the best were games like street hockey and football. When I



ELITE ATHLETES AN ATHLETES VIEW OF POSSIBILITIES AND LIMITS

A few years out of date but very insightful - Jamie

Sergey Bubka, Ukraine, is the reigning world record holder in the pole vault with 6.14m (20-13/4). Bubka won

played football, which was the most popular sport, I would play as an attacker, or in the defense or even in goal if I felt I had to save the team. I would play in five positions. I would run like crazy because I just had to win.

I wasn't very big for my age. In fact I was probably the smallest. I played with my brother who was three years older and other guys who were even four or five years older. That was how I grew to love sport. From the age of eight I began physical education classes in school and took part in sporting competitions between schools and also between the different classes. I could really run until I was dead on the sports field because I had to win.

As long as I can remember, what I call the Spirit of Sport—the competitive spirit—was in my blood. I realized that sport was something fantastic. When I do sport, or anything else in my life, it must be 100 per cent or 1000 per cent. I must give everything I have. This is part of my character.

In my first class, because I had good speed and coordination, I was selected for special coaching in gymnastics. But when I showed up, as they asked me to, at 8 am one morning, the teacher told us we had to walk to the gymnastic hall. When I asked how far it was and the teacher replied, "It is about 15 minutes walking," I decided that it was too far and so I went home!

Around the same time, when I was about 8 or 9 years old, a coach invited me and my brother to take special swimming lessons. I think I went twice. I remember being under the water, not able to breathe, and I knew it was not for me. I have such blood that I have to move fast, to be in the open air.

By the age of 10, I had taken part in most sports at school and outside. In the USSR at that time you did not normally start athletics at such a young age. But a friend of mine from the neighborhood recommended me to a pole vault coach named Vitaliy Petrov because he knew I was strong for my age. I remember going for a test with Petrov. He timed us running 30 meters and also made us do pull-ups. I managed to do 15. That was a big result

and impressed Petrov because I wasn't just using my arms but was swinging my whole body. So he could see I had good movement.

I was the youngest in the training group which moved to the city of Donetsk because it had one of the few specialist pole vault centers in the Soviet Union. I was very lucky to have met Petrov because he was to be the greatest influence on my life as an athlete.

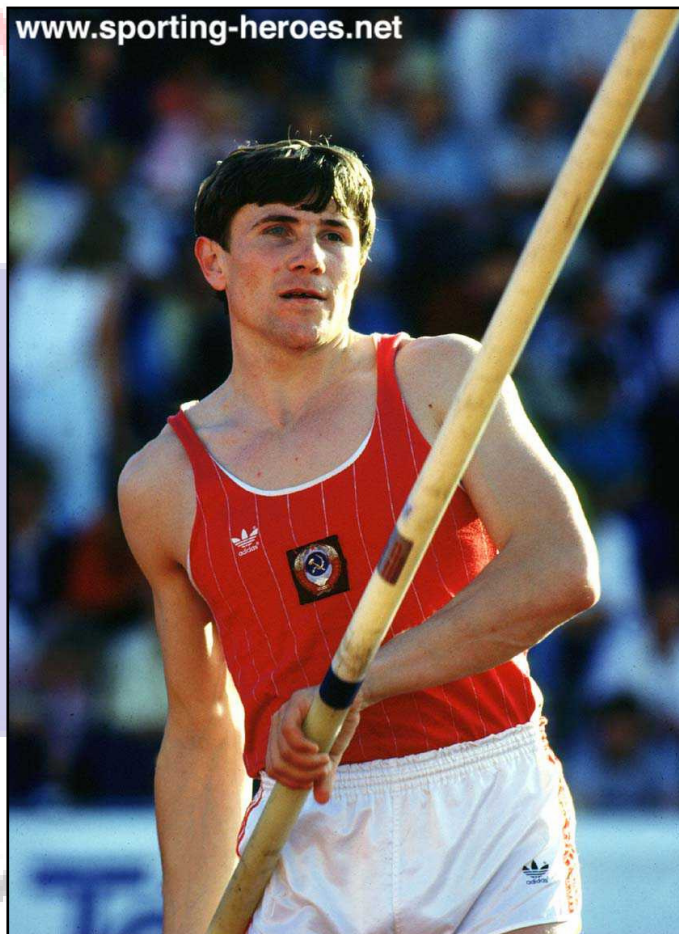
I was with him for 16 years and I can say that he is a very smart guy. No one in the world knows more about pole vault technique than Petrov. As I will now explain, it is the work of a team of motivated people that has helped me develop my full potential as an athlete. The talent and determination may have always been in my blood but I will always be grateful to those people who have been with me all the time: when I lose, as well as when I win.

Petrov was a very clever coach because he was not in a rush to get results. Many coaches find talented athletes and want them to win medals immediately. But Petrov wanted me to have a long career. He always used to say: "Sergey, I want you to have your best results in senior sport." So, for example, I did no weight training at all until I was 16: just exercises with my body. Every exercise was designed to make me stronger, but slowly, without putting too much stress on my joints and muscles as I was growing.

It is dangerous to overload the body at this age. What we were doing at times was not really pleasant or fulfilling: just very specific exercises to strengthen muscles and to make tendons looser, but there was a good reason for them as they prepared the muscles for heavier loads. This

is why I have had relatively few injuries in my career.

I was not really happy with my training until I was about 16. The first five or six years I could not "feel" the right movement. But when I was in competition, everything worked out well. This was because I always loved the stress of competition. Under stress I feel alive: I can concentrate and be motivated. I love to make a third attempt at a height that can win a competition or leave me in a bad place if I miss. I can compete for seven or eight hours. No problem. I don't want to leave the stadium. Because I am sensitive, I find I can use all the special things about competition to raise my performance to the next level.



Petrov planned for me to do well at the 1984 Olympic Games when I was 20. But I won my first World Championships gold a year earlier and then missed the 1984 Games because of a political boycott. Still, he was right in a way, because I broke my first world record in 1984. Maybe the greatest thing that Petrov helped me understand was The Culture of Movement. He showed me that the pole vault was really two sports. It was athletics on the runway: during the approach run and takeoff, and it was gymnastics once you were in the air and until you cleared the bar. Petrov realized this and he began to seek out experts in gymnastics. He wanted to use their knowledge to help us. Although we knew all about speed and power as athletes, gymnastics was another world.

Since 1990 I have been helped by a gymnastics coach called Alexandr Salomakhin who lived in Donetsk. First he taught us basic gymnastic routines and then he devised special exercises for the pole vault. He helped me make really great improvements in the second phase of the vault. I would say that my ability in this phase is what helped me break world records. He helped us to discover many things: our position in the air; our sense of where the bar is; the angles of our limbs when we are in the air.

The thing is, many pole vault coaches think they know everything, but they are too focused on their speciality. Petrov was excellent because he was interested in every detail. Even when we were jogging he would be looking at where the shoulders were, how the hips were aligned, the position of the feet. It was important to Petrov that everything we did was technically correct. Even our strength training. Because he wanted us not to have to waste time when we came to the fine technical work before a competition. He wanted us to be technically efficient even during the physical conditioning period.

But one of the biggest lessons I learned from Petrov is the importance of communication, not just between coach and athlete, but in the form of communication between the brain and body during competition. I try very hard to concentrate during competition—I “feel” and think about every little art of every little phase; from the start of my runup to the moment I land on the mat.

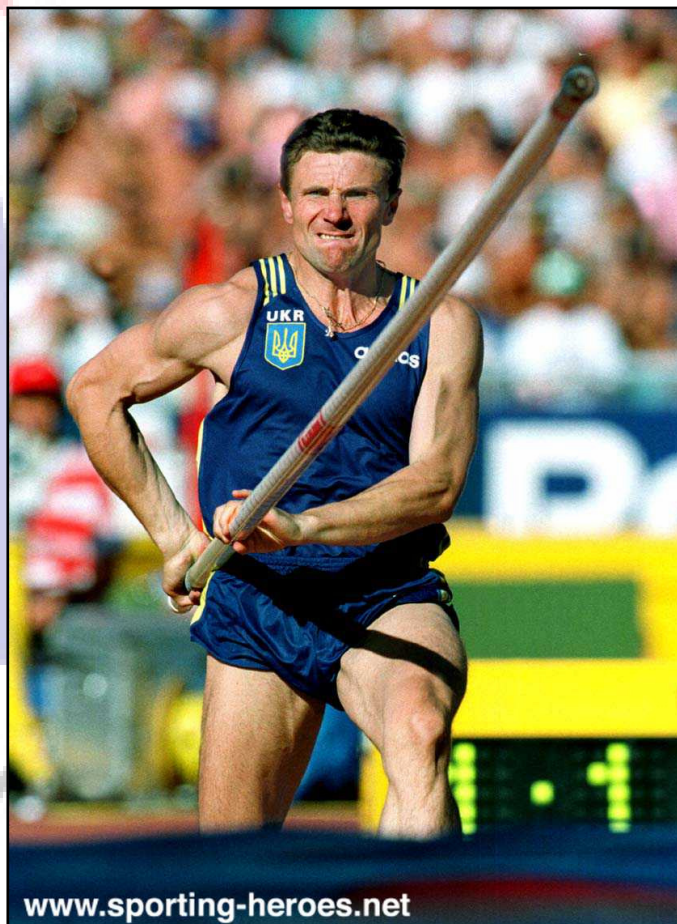
I have a picture of what I have done. I have to analyze everything, and then to make any adjustments I think are necessary. It is very important for an athlete to do this because the coach cannot be with you. When you compete you are on your own. You must learn to think and act fast. To adjust. When I compete my brain becomes a computer. Athletes must analyze, and make a picture of what they have done, of what is wrong and how to make it perfect. That is why I have confidence when I am competing. I do not have to look for my coach for explanations. I arrive at the stadium two hours before a competition. Because I want to look at every possible thing that could influence my result: how is the vault area, where are the stands located, what are the weather conditions? I need to be prepared for everything. I need to think about technique, about running, about my warmup—what I was doing wrong.

I also do visualization exercises, what we call in Russian “training for the brain.” I also need to soak up the atmosphere: to raise my spirit and adrenaline for the competition. Finding motivation is something that you must work harder at as you get older and become more successful. As an athlete I have also had to learn to be reserved. To waste no energy that could be used in competition.

I will give you an example. By the time I was 15, I had left my family and was staying with my brother at the sport school in Donetsk. Once, I went to the grocery to buy 100 grams of cheese. But the woman behind the counter tried to give me just 90 grams. She wanted to cheat me. Now I lost my temper. I felt outraged and argued with the woman because I had been brought up to be honest with people. But later I was told: “Don’t explode. Don’t waste your nervous energy on these things. You must learn to focus that energy into competition.

Give it a good channel.” As I got older I began to avoid anything that was too much of a distraction. I realized that I was sensitive by nature and that sometimes I let things affect me. For example, I try not to spend too much time with journalists, or even making speeches like this one!

Back in 1986, I began to get a lot of requests to make appearances. And I always accepted the invitations. I was actually happy to meet people and to speak. But when I got to The European Championships, I found that I had no nerves, no adrenaline. I was shocked. I won, but it was difficult. So when the competition was over I spoke with a psychologist Rudolf Zaginoff—who had been



recommended by Petrov. He told me: "You were talking too much before; you spent too much time thinking and discussing the competition before it happened. By the time the competition began you were empty."

Since then, he has advised me to stay quiet in the two months before the major competitions. To be reserved, to stay calm. I am careful not to empty my psychological battery. Now, during a major competition I relax with a book, or I go to a park or other quiet places, or make conversation with my coach, family and very close friends. But I avoid stress.

This is also, a little bit, the method of the former Soviet system. In the West, athletes and the coaches talk more. They are more closely involved with promotions and publicity and other commercial activity. But in the end, the result comes first. If you don't win, then nobody will ask you for an interview or to take part in promotions. That is the reason that sometimes I appear to be cold—arrogant—with my fellow competitors and with the media. But there is a reason. It is not part of my nature. In fact, I enjoy very much meeting people and exchanging opinions with them. But people must understand that to be successful I must be left alone.

When I am speaking about my life, and my mentality as an athlete I realize that the last year and a half have been very important. On the bright side, I made discoveries about weight lifting (by taking the advice of a specialist weight lifting coach), which have been incredible. Making some changes to this important part of my training has helped me very much, especially during the period when I was injured.

This injury to my right Achilles tendon stopped me from taking part in the Atlanta Olympic Games. The worst thing about it was that I was in great shape, especially psychologically. But I consulted specialists, one from the USA and another from Finland who was also a surgeon, and it was clear that I had a tear in my tendon of almost 25%. Had I competed it might have torn 100%. This was in August 1996.

Although I tried to avoid surgery, in the end the injury did not go away. In fact it got worse, with the inflammation going to the bone, so I agreed to have an operation. This was carried out on December 23, 1996, in Helsinki. The surgeon said the injury was worse than it had appeared on the scans: they had to cut even the bone. Not until April 1997 was I able to jog.



And I will be honest with you: all my training and competitions this year (1997) have been very, very difficult. When I tried to increase the loads there would be a reaction. The cycle was up and down, up and down. Normally I would train, take anti-inflammatories, train, take anti-inflammatories and go on like this. I had to work always with pain. This is very tiring mentally too, when you can feel an injury but still want to achieve your best results.

Sometimes after training the pain was so bad that I didn't see how I could continue. But I knew that 1997, with the World Championships, was a very important year. I wanted very much to keep my tradition going in Athens and to win six in a row. Once I was there, I had to deal with the fact that every day I was in pain. I finished my heavy training at the end of July but still wasn't sure if I could compete in Athens. I had to make many small modifications to my training as I began to get faster and sharper.

I stopped weight training and began to polish my technique. Even during the qualification on August 3 I felt pain. It was only in the final, when I was running with better technique, that the pain eased. When I first got injured I never felt like it was the end of my career. That was because I knew what was wrong. I was injured. Injuries heal. I was still in great shape, I loved to compete and I still wanted to improve. My motivation was to take part in my 6th World Championships and to win again.

Before I competed my psychologist said: "Sergey: just remember you have never lost at the World Championships and during this competition, think of your best jumps. Put a picture in your mind." Before the final I decided on my strategy: to jump at 5.70, 5.90 and 6 meters, because I felt 6 meters would win. It was a calculated risk. My winning jump was 6.01 and it was quite good technically. But I was a little bit too far back when I took off, because I was running faster. But because I was a little behind I was able to achieve very good penetration during the catapult phase.

I also discovered some new ways to motivate myself. One was to scream just before I began my runup because this helped me concentrate and to raise my fighting spirit. My physiotherapist Arkadij Shkvira, who used to train with me in Donetsk, also showed me some acupuncture points which, when pressed, help boost energy. After the competition I found that I had been pressing these points so hard that they were bleeding.

Many have asked what motivates me when it comes to record breaking. After all, I have set 17 outdoor world records and over 30 in all indoors and outdoors. The

main factor is that I have such a character that I want to improve. To be perfect. Many people have said that I go for so many records because of money.

But they forget that I grew up in a Socialist society: there was no money at all then. Remember, I had already set nine world records outdoors before the fall of the Berlin Wall in 1989. I have always wanted to achieve good results in sport. Petrov said to me: "Concentrate on the results, and the money will come as a result." I think it is sad when sports people put money first. That is the ugly way. Sport then becomes like any other job. But sport should be special. It should be about emotion and desire. You must want to be the best. The business should come second always.

It is important also to be realistic. You must set goals you can achieve and then continue to work hard and improve. When I set world records I was already thinking of the next one. But it is not easy. I am not a robot. If I vault 6.13 for a world record and then later 6.14, some people think: "he has improved a record by one centimeter; he is playing games." But I don't see a world record as just an improvement but as something brand new. Each record is special in its own way. Each takes place on a different day, under different conditions, with different emotions. You must find the psychological and physical keys.

I have never recognized the concept of limits. Never. I think an athlete who accepts limits is dead. Even now, when I am almost 34 years old, I believe in new levels. I still think about clearing 6.20 next season, even though I have missed training because of injury.

It is important to plan every detail carefully, and to work together as a team. My results are due not only to my character and preparation but to the contribution of my first coach, my current pole vault coach, my running coach, my weight lifting coach, my psychologist, my doctor, my physiotherapist, my masseur. We must combine all our knowledge to improve the final result.

To conclude, I hope you have all come to realize that, above all, I love the sport. I have already been in athletics for 24 years but don't want to stop. Why should I stop if I enjoy it so much? I don't agree with the view that you should finish at the top, something which was also the philosophy in the Soviet Union. Maybe I can accept being second, or third or fifth because I still love what I do. I have always felt that a sports man's life is the best, most beautiful life you can have.

Thank you for your attention.

I think that these could be applied to all sports - Jamie

1. Get rid of the television. The news is invariably depressing. Instead of watching others amuse us, we should entertain ourselves with mental and physical activity. If you must watch it, tune in to ITV, the commercial breaks give you an opportunity to leap up and do some press-ups or bent-knee abdominals. Only 1 in 50 Kenyans have television.
2. Sell your car and become a rich pedestrian. Buy a bicycle. 5 miles of cycling is equal to 1 mile of running. 1 in 3 Kenyans own a bicycle.
3. Cook your own food. Fast-food shops have not caught on in Kenya. They don't like fried food. They boil and roast. Obesity in Kenya affects only 1 in 200. In Britain, the ratio is 25 overweight people per 100.
4. Abolish or drastically reduce unemployment benefit and welfare hand-outs. In Kenya you work or starve or run to earn a living. If you become a mother, you must provide for the offspring. There is no unemployment or welfare benefit in Kenya. They have learned that man's destiny on earth is work.
5. Don't buy children computer games. In 100 years' time our heads will be twice the size. Our bodies will be the same size as our heads.
6. Schools should alter their modus operandi to 4 hours of study in the morning and 2 hours sport in the afternoon, every day of the week.
7. Don't watch over-paid sportsmen perform. Instead, perform yourself.
8. Burn down shops that sell tobacco and liquor to under-age juveniles.
9. Get away from too technical jargon in running training. In Kenya, they think microcycles, macrocycles and mesocycles are different types of Japanese motorbike.
10. Train at altitude for a month at a time, 3 times a year.
11. Make 1/3 of your total running much faster than the other 2/3.

Be carried off the running track once a week on a stretcher, due to exhaustion



RUNNING

12 STEPS TO BEATING THE KENYANS & ETHIOPIANS



BETTER COACHING

CROSSING THE T'S AND DOTTING THE I'S

As a young coach I was always told to be sure to cross the T's and dot the I's. At first I thought they were kidding me, but the longer I coached the more I realized that was much truth attached to that time worn cliché. Here are some T's to cross and I's to dot that I have found to be important in my own coaching and through observation of successful coaches and athletes the past 38 years.

Talent -- It all begins here: without native athletic ability and a feel for the event it is tough for an athlete to excel at the highest levels. That doesn't mean that someone with less talent can't succeed, but he or she will have to work much harder. The less talented individual will also have less margin for error in training. The coach's job is to identify talent, nurture and direct the talent.

Tenacity -- Mental toughness is the result of sound physical preparation. It is also the ability to focus on the task at hand and not be distracted by minor setbacks. The champion is often the one who can persevere and overcome obstacles.

Technique -- Sound fundamental movement skills are a precursor to specific event technique. Both must be developed early in an athlete's career and refined as the athlete progresses to the elite level. The challenge is to become technically proficient without becoming mechanical.

Training -- This is the process of acquiring specific fitness while balancing all training components. Obviously this is the foundation for success. No one can succeed without a good training base. Never lose sight of the fact that training is a means to an end, not an end unto itself. That end is competition. Winning is the outcome of good preparation.

Tactics -- Tactics are based on knowledge of the sport and of effective competitive skills. Know the rules; study the skills involved in competing well.

Testing - The competition is the ultimate test of the total training program. It must be measured not only by wins

and losses, but also by improvement and quality of effort. In order to be ready for the ultimate test, it is important to test periodically in training to assess progress toward a goal.

Inspiration -- This is the spark that motivates the coach and the athlete to persevere through difficult times. It is the vision of the results of the hard work. It is the courage to do the little things that make the best better. It is willingness to do the morning run when it is snowing and it would be easier to stay in bed. It is doing the cooldown after a very hard workout when it would be easier to head for the shower. Inspiration is the guiding light toward pursuit of the goal.

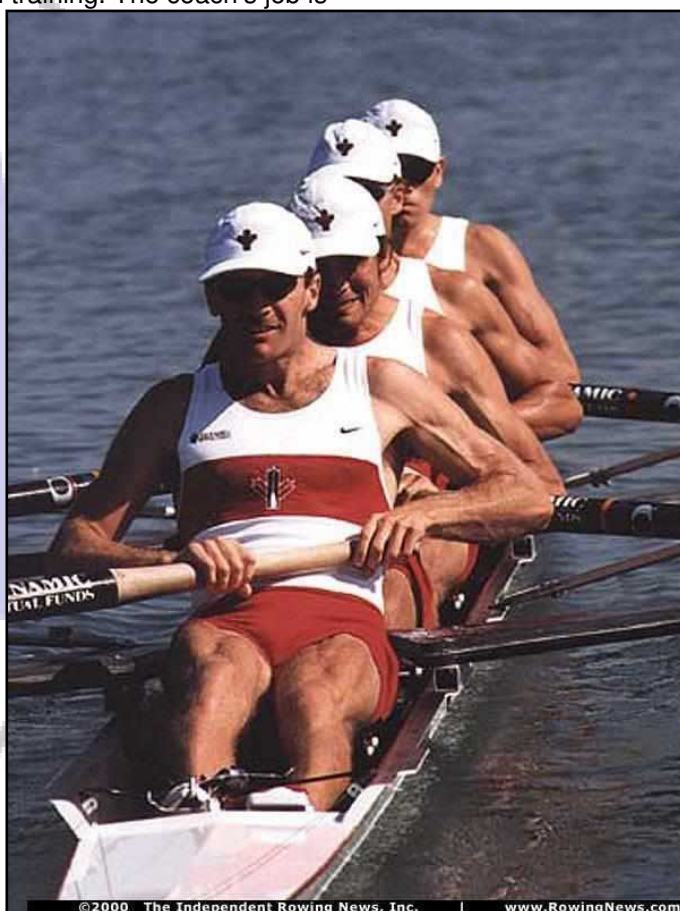
Innovation -- The willingness to try new things, to change even if you have been successful. Change is a constant. We must be willing to change to get better. This involves continually learning and upgrading your knowledge base. Never be satisfied with where you are now; always seek ways that will help you get better.

Intensity -- This is the laser-like focus on the task at hand, the focus that is necessary to be the best you can be. It is not screaming and hollering; it is focus, concentration and inner drive. It is attention to detail.

Interest -- This is the commitment to improve. Your interest must be clearly defined, whether it is to be the best coach or athlete you can be. The interest must be unwavering.

Involvement -- This is necessary for success in any endeavor. You must be fully involved; it cannot be a passing fancy. Involvement is a 24 hour commitment, not two hour commitment during the workout. It is committing to a lifestyle that supports excellence. Everyone wants to be involved on meet day, but the winners are those coaches and athlete who pay

the price everyday.



PHYSIOLOGY

THERE IS NO LACTATE THRESHOLD

Lactate is a bad guy in the running world. It's blamed for lots of bad things including fatigue, muscle soreness, and preventing you from running faster. There is even a well

known and widely followed training method - tempo runs – that was originated specifically to help you overcome all the bad things lactate was believed to be doing in your body, therefore helping you run faster.

The problem is that none of the bad things you've heard about lactate are true. None of them! In fact, exercise physiologists have known for more than 10 years that all the bad things previously believed about lactate are not true. Indeed, quite a bit of the updated information about lactate has been known since the mid-1980s, meaning that some of the updated information on lactate has been known for 20 years. It's not even a case of controversy amongst exercise physiologists about the negative effects of lactate – it is widely accepted in the exercise physiology world that lactate is NOT responsible for any of the bad things you've heard about it.

If the information about lactate is known to be false, and the true nature of lactate has been known and accepted for many years by the exercise physiology world, then why do runners continue to believe all those horrible things about lactate? Why do the negative beliefs about lactate persist in the running community in the face of incontrovertible information to the contrary? I won't speculate why the long updated information about lactate hasn't been widely disseminated within the running community. Instead, the purpose of this article is to bring you the latest information about lactate and its role in your body. My goal is to set the record straight on lactate so that at the end of this article any negative beliefs you've held about lactate are dispelled, replaced with recent information that gives appropriate credit for the important energy role lactate plays in performance. Considering the depth and width of the negative beliefs about lactate that permeate the running community, this is a big task, so let's get started.

Note – runners generally use the terms "lactate" and "lactic acid" interchangeably, even though they are not the exact same chemical compound. Though there are chemical differences between lactate and lactic acid these differences are not significant to our discussion. For our purposes we will use the term lactate and lactic acid interchangeably.

Lactate History

In order to properly tackle the various negative beliefs about lactate we begin with a review of the origin of these beliefs about lactate. Why has lactate been considered so important in terms of running performance and just how did lactate become such a villain in the first place? To answer this question requires us to first review the beliefs about the limits of exercise – i.e. why can't you run faster?

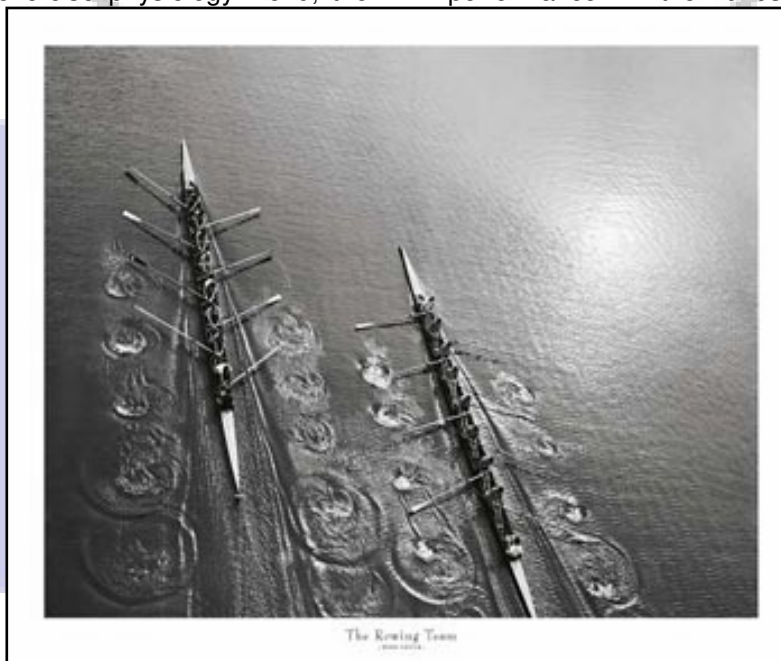
You have probably been exposed to the terms "aerobic" and "anaerobic". Well, these 2 terms are key to understanding the origin of the villainous beliefs about lactate. In basic terms, aerobic simply means with oxygen and anaerobic means in the absence of oxygen. These terms are talking about 2 ways your body has of producing energy. Your body can produce energy with oxygen, aerobically, or without oxygen, anaerobically.

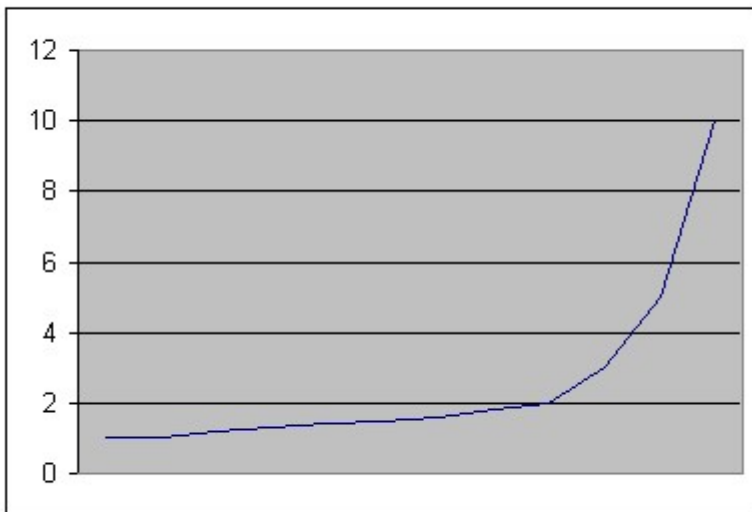
These methods of producing energy – with and without oxygen – are central to the theory of endurance performance. In the 1920s the British physiologist and

Nobel Prize winner A.V. Hill first proposed the exercise theory that has since been termed the cardiovascular/anaerobic model and has been a foundation belief of the running community for more than 70 years. In essence, Hill's theory was that the reason you can't run faster is because you can't get enough oxygen to your working muscles. He suggested that as the intensity of exercise increased the runner reached a point where he was unable to take in and use more oxygen. You have likely heard this belief expressed as the

term VO₂max. "V" means the volume of flow of oxygen to the body, O₂ (correctly written O₂) is the chemical symbol for oxygen, and max is the abbreviation for maximum. So, the term VO₂max simply means the maximum volume of oxygen being taken in and used by the body. At VO₂max, the runner is unable to absorb and use more oxygen. However, and this is key, Hill's belief was that at VO₂max the runner was not running as fast as possible. The runner could run a little bit faster even though he could not take in and use more oxygen.

What happens when a runner can't get enough oxygen to meet the aerobic energy needs of his muscles? When this happens, the body must meet its energy needs via anaerobic methods. As the runner gets closer and closer to VO₂max, more and more of his energy is met via anaerobic metabolism. Now we come to the genesis of the negative beliefs about lactate. The cardiovascular/anaerobic model preached that lactate was produced as a result of anaerobic energy production. In accordance with this model, as the





the lactate threshold, but has also been called the anaerobic threshold and the ventilation threshold.

Table 1: Blood lactate level rising in a precipitous manner - i.e. lactate threshold

The Real Facts About Lactate

Now that you understand why lactate has been considered important by the running community and the origins of the negative beliefs about lactate we turn our attention to the updated information about lactate.

intensity of exercise increased oxygen becomes increasingly in short supply, forcing the body to rely more and more on anaerobic metabolism, resulting in an increasing higher level of lactate within the body. This model further suggested that lactate interfered with the muscles' ability to contract, thus causing fatigue.

In essence, here are the basics of the cardiovascular/anaerobic model, which explains why lactate has been considered so important by the running community for so many years. The cardiovascular/anaerobic model believes:

1. As exercise intensity increases, the body's energy needs cannot be met entirely through aerobic metabolism – i.e. there is insufficient oxygen available to the working muscles.
2. Due to the increasingly insufficient oxygen supply, the energy needs of the body are instead increasingly met via anaerobic metabolism – i.e. the muscles have become anaerobic.
3. Anaerobic metabolism produces lactate as a by-product.
4. Increasing levels of lactate interfere with muscle contractions, causing fatigue within the muscles.

Now you know the basics of why lactate has been considered important to the running community – it was believed to cause fatigue. This brings us to the concept of lactate threshold.

When scientists first starting measuring changes in blood lactate levels with increasing exercise intensity they noticed something interesting. Lactate seemed to rise very slowly at first, then all of sudden it began to rise precipitously, as illustrated in table 1. The traditional explanation for this sudden rise in lactate levels was that the muscles had become “anaerobic” - meaning that anaerobic energy production had become the primary source of energy within the muscle. The point where lactate levels began increasing rapidly is usually called

Muscles don't become anaerobic during exercise

The first thing we need to address is the foundation belief that at high exercise intensity there is insufficient oxygen to meet the energy needs of the body. Despite the widespread belief by many that there is insufficient oxygen to working muscles at high exercise intensity, this has never been proven. In fact, it has always been *assumed* there is insufficient oxygen, but has never been proven despite years of efforts by physiologists.

McArdle, Katch, and Katch, writing in their well respected exercise physiology textbook have this to say about limited oxygen supply during exercise. “The usual explanation for a lactate increase is based on an assumed relative tissue hypoxia during heavy exercise.”(1) They clearly state that the belief that there is limited oxygen to working muscle (relative tissue hypoxia) is an assumption. It has never been proven.

Despite the fact that this belief has never been proven, it is important to know that it has been treated as a *fact* for many years by many, and perhaps most, in the scientific community and, consequently, by the lay public.

However, more recent efforts by experts using new techniques to determine if muscles become anaerobic during heavy exercise have shown the opposite to be the case: “these data demonstrate that, during incremental exercise, skeletal muscle cells do not become anaerobic...since intracellular PO₂ (the oxygen pressure in the muscles) is well preserved at a constant level, even at maximal exercise.”(2)

So, you now know that muscles do not become anaerobic during exercise.

Why lactate levels increase with exercise intensity

If muscles don't become anaerobic, then why do lactate levels increase during exercise of increasing intensity? After all, isn't lactate produced through anaerobic energy production? The short answer to these questions is that

lactate is produced during carbohydrate metabolism, irrespective of the availability of oxygen. Here is what Prof. Tim Noakes has to say on this topic in the most recent edition of *Lore of Running*:

“As the exercise intensity increases, so does the rate of carbohydrate use. When high exercise intensities (greater than 85% to 95% VO₂max) are achieved, virtually all the energy comes from carbohydrate oxidation (G.A. Brooks and Mercier 1994; Brooks 1998). This means that the rate of energy flow through the glycolytic pathways increases steeply with increasing exercise intensity. The result is that the rate of lactate production increases inside the muscles.”(3)

In essence, then, lactate is a by-product of carbohydrate metabolism. It is not a matter of the body becoming anaerobic. Instead, as the intensity of exercise increases the body relies increasingly more on carbohydrates to provide the needed energy. More carbohydrates being burned results in a greater volume of lactate being produced and an increase in blood lactate levels. The muscles have not become “anaerobic” - lactate is increasing because the body is burning more and more carbohydrates.

There is NO lactate threshold

Okay, now we know that the muscles don't go anaerobic during heavy exercise and lactate production is due to carbohydrate being burned to produce energy. This brings us to the topic of “lactate threshold”. Recall that the theory of lactate threshold was that at some exercise intensity blood lactate levels increase dramatically, i.e. crosses a threshold, due to anaerobic metabolism. We already know that lactate is being produced in increasing high amounts for reasons other than the muscles becoming “anaerobic”, but is lactate increasing after crossing some “threshold”? Again, the answer is no.

Lactate increases exponentially with increases in exercise intensity and does NOT exhibit a threshold. This being the case, why did exercise physiologists believe there was a lactate threshold? Going back to Prof. Noakes again:

“This mistaken conclusion resulted from at least 2 errors. First, too few blood samples were measured. For example, if only 4 blood samples had been drawn at running speeds of 10, 14, 16, and 20

km per hour, then a fictitious anaerobic threshold would have been identified at 15.5 km per hour. But measuring blood lactate concentrations repeatedly – for example every km per hour – shows that blood lactate concentrations rise exponentially without any evidence of a threshold phenomenon.”

“It is clear that the blood lactate concentrations do not show a clearly defined, abrupt threshold response during exercise of progressively increasing intensity. Rather, blood lactate concentrations begin to rise as soon as progressive exercise commences. However, at low intensities, the rate of the increase is so low that it is barely noticeable. Only when the exercise becomes more intense does the rise become apparent, which perhaps explains the erroneous impression that blood lactate concentrations increase abruptly when the lactate threshold is reached.”



“For these reasons, the term anaerobic threshold, lactate threshold, and lactate turnpoint are no longer justifiable”(4)

So, you see, there is not a lactate threshold. Lactate increases exponentially with increases in exercise intensity and exhibits no evidence of a “threshold”.

Lactate doesn't cause fatigue – it helps prevent fatigue

You might say at this point that whether lactate is produced by anaerobic metabolism or not, or increases in a “threshold” manner or not is immaterial if increasing amounts of lactate cause fatigue. After all, it doesn't really matter how the level of lactate increases if lactate is the cause of fatigue. (Recall that it has long been believed by the running community that lactate causes fatigue.) It is this core belief that has caused runners to focus so intently on lactate threshold - lactate causes fatigue and the lactate threshold is the point where there is suddenly enough lactate in the body to cause fatigue to increase rapidly. There is no doubt that blood lactate levels increase with increasing exercise intensity. If lactate causes fatigue then it wouldn't matter if muscles become anaerobic or how lactate increases in the body - these points do not negate the idea that lactate causes fatigue. Lactate does increase with increasing exercise intensity and if it causes fatigue, then the other points are ancillary. Therefore, the most important question to ask is, Does lactate cause fatigue? Absolutely not!

"Lactate is a totally innocuous substance that, if infused into the bloodstream, has no noticeable effects."(5)

That's right - you could inject your muscles with lactate and you would experience NO additional fatigue because lactate does not cause fatigue.

To top off the facts about lactate is this kicker – lactate not only does not cause fatigue as it has long been believed to, but there is reason to believe it actually helps prevent fatigue. How's that for a complete turnaround of everything you ever believed about lactate?

Researchers examining muscle fatigue in rats caused by a reduced pH and loss of potassium found that the "subsequent addition of...lactic acid led, however, to an almost complete force recovery." These researchers write:

"In contrast to the often suggested role for acidosis as a cause of muscle fatigue, it is shown that in muscles where force was depressed by high (potassium), acidification by lactic acid produced a pronounced recovery of force. Since intense exercise is associated with increased (potassium), this indicates that acidosis may protect against fatigue rather than being a cause of fatigue."(6)

What they are saying in the above quote is that lactic acid in the muscles is likely to protect against fatigue, allowing the muscle to work longer and/or harder before fatigue sets in.



Hydrogen Ions & Muscle Acidity

Some physiologists, knowing that lactate does not cause fatigue, have suggested an alternate theory for muscle fatigue. They suggest that hydrogen ions (H⁺), which are produced during the conversion of lactic acid to lactate, are the true cause of muscle fatigue. This theory holds that the H⁺ changes the pH within the muscle, increasing muscle acidity, which interferes with the muscles' ability to contract. As more and more lactate is produced, so too are more H⁺ produced, leading to an increasing acidic muscle and an increasing level of fatigue. This theory explains why increases in lactate correlate with increased fatigue. H⁺ is produced as a result of lactate metabolism, the H⁺ makes the muscle cell acidic, and the acidity interferes with muscle contraction (in effect,

causes fatigue) - more lactate means more H⁺, producing greater acidity, resulting in more fatigue.

However, this theory has been challenged. Dr. Bruce Gladden, in his 2004 review of lactate metabolism writes,

"...lactic acid is more than 99% dissociated at physiological pH. This has led to the incorrect notion that the donation of a proton by each lactic acid molecule *causes* a decreased pH during conditions such as exercise.(7)

A research update by Stackhouse, et al addresses this topic:

"In addition, many textbooks report that muscle fatigue is mainly the result of a decrease in pH within the muscle cell due to a rise in hydrogen ion concentration ([H⁺]) resulting from anaerobic metabolism and the accumulation of lactic acid. Recent literature, however, contradicts this assertion."(8)

These 2 quotes mean that lactate derived H⁺ does not play a major role in changing muscle pH levels. H⁺ does increase in the muscles, but it is not a primary player in creating muscle acidity.

Finally, a research paper by Westerblad et al says this:

"...the increase in H⁺ (i.e. reduced pH or acidosis) is the classic cause of skeletal muscle fatigue. However, the role of reduced pH as an important cause of fatigue is now being challenged,

and several recent studies show that reduced pH may have little effect on contraction in mammalian muscle at physiological temperatures."(9)

What Westerblad is saying here is that recent research indicates that increased muscle acidity is NOT a cause of fatigue. Though it is too soon to dismiss the idea that muscle acidity contributes to fatigue, the theory is certainly being challenged and recent evidence on this topic suggests the H⁺ are not the primary cause of muscle acidity.

Lactate is Actually A Potent Energy Source

Instead of being a source of fatigue, exercise physiologists now know that lactate is a potent fuel source for the body, and some have suggested it may be

the most important fuel available to the muscle. Research shows that about 75-80% of lactate is used to produce energy through oxidation, with the remainder converted to glucose and glycogen. Working muscles oxidize the lactate for fuel. Blood lactate is absorbed by the liver, the heart, and inactive muscle. The liver converts uses lactate to produce glucose and glycogen, the heart uses lactate as a preferred fuel, and inactive muscle stores lactate.

More recently leading lactate researcher George Brooks has pioneered the concept of a "lactate shuttle". The importance of the lactate shuttle is that it is the mechanism that allows carbohydrates to be moved from one muscle group to another. Muscles do not have the ability to send their stored carbohydrates (glycogen) to other parts of the body, so, for example, a resting group of muscles can't send their stored glycogen to working muscles that may be low on glycogen. Dr. Brooks has shown that the lactate shuttle is the way in which the body's store of carbohydrates can be transferred to working muscles during and after exercise. For example, during a run workout glycogen stores in your inactive arm muscles can be converted to lactate and shuttled to your leg muscles, providing an additional and important source of energy for your working leg muscles.

Summary

In summary, it has long been held by the running community that lactate was the primary culprit in lots of metabolic "crimes". These beliefs are now known to be false. Muscles do not become anaerobic during exercise, lactate does not cause fatigue, and there is NO lactate threshold. Instead lactate is produced as a result of carbohydrate metabolism and may actually delay fatigue. Lactate is accepted as an important and potent source of fuel for working muscles. In his 2004 review of the current state of knowledge about lactate Prof. Bruce Gladden sums it up best. He writes:

"For much of the 20th Century, lactate was largely considered a dead-end waste product of glycolysis due to hypoxia, the primary cause of the O₂ debt following exercise, a major cause of muscle fatigue, and a key factor in acidosis-induced tissue damage..."

The bulk of the evidence suggests that lactate is an important intermediary in numerous metabolic processes, a particularly mobile fuel for aerobic metabolism, and perhaps a mediator of redox state among various compartments both within and between cells. Lactate can no longer be considered the usual suspect for metabolic 'crimes', but is instead a central player in cellular, regional, and whole body metabolism."(6)

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ASSOCIATION OF ROWING COACHES, SOUTH AFRICA

NUTRITION NUTRITION FOR TRAVELING ATHLETES

Tips for Surviving Travel Challenges

Top 10 challenges of travel

- Being on the move causes an interruption to the normal training routine and changes energy needs.
- Changing time zones creates jet lag and the need to adjust your eating schedule.
- A change in environment – sudden exposure to altitude or a different climate – alters nutritional needs and goals.
- The new environment is often associated with reduced access to food and food preparation opportunities compared to your own kitchen and routine. Leaving home also means leaving behind many important and favourite foods.
- The catering plan or expense account may not stretch to cover usual eating habits and nutritional needs, especially snacks and sports foods.
- A new food culture and different foods can be overwhelming to young athletes and those with fussy palates.
- Differences in hygiene standards with food and water in different countries exposes the athlete to the risk of gastrointestinal bugs.

- Reading food labels or asking for food may involve mastery of a new language.
- A substantial part of your new food intake may be coming from hotels, restaurants and takeaway outlets, rather than being tailored to the special needs of athletes.
- The excitement and distractions of being away makes it easy to lose the plot – with common challenges being “all you can eat” buffets and Athlete Dining Halls, being away from Mum’s supervision, and being confronted with a whole new array of food temptations.

1. Plan ahead

Good preparation solves many of the challenges of travel. Well before you leave home, sit down and consider the issues likely to be faced on the upcoming trip. Your own past experiences or stories from people who have travelled to this destination will be a good source of information about what to expect, where the challenges will come from, and how best to solve them. Things to consider include travel itself, the general food supply at your destination, the specific catering plans that are in place for you, and special nutritional needs arising from your training and competition goals or from the new environment. You will need to follow a good plan while you are away, but many elements of this plan will need to be organised ahead of time.

2. Eat and drink well when on the move

The challenge starts even before you arrive at your destination! Travel itself is stressful, changing both your nutritional needs (changes in activity levels, increased fluid losses in artificial environments) and your opportunities to eat. Changes in time zones also need to be taken into account. A travel eating plan that matches new nutritional goals to food availability will help you to arrive at your destination in the best shape possible.

3. Take a traveling food supply

Once you know about the food supply and catering arrangements on your trip, consider whether foods that are important to your everyday eating are likely to be absent or in short supply at your destination. It is not always necessary to disrupt your familiar and successful eating patterns, or risk missing out on important nutrients. There are a number of foods and special sports products that can travel with you, or ahead of you, to establish a supplementary food supply. Travel food supplies may be used to provide snacks or an addition to meals, or take care of the special needs of competition.

4. Establish a new routine quickly, based on new nutritional goals and your new timetable

Hit the ground running, by adjusting your body clock and eating habits to the needs of your destination as soon as

possible - even while travelling to get there. Move meal times as quickly as possible to the new time-frame. You should factor in not only the general clock adjustment, but the time-table of training and meals that your new environment requires. It may be quite different to the way you do things at home. Remember that you may have different nutritional needs at your destination, due to a change in climate or altitude, or a change in the energy expenditure of your training and competition program. Adjust your meal and snack routine immediately, rather than waiting for problems to occur.

5. Be wary of food and water hygiene

Even in safe-sounding destinations, you are exposing yourself to a new set of “bugs” and new routines of personal and food hygiene. The stress of travel and your new training and competition program may reduce your resistance to illness. Adjust your food and drink choices to minimise your risk of succumbing to gastrointestinal upsets.

6. Learn about your new food culture

The fun side of travel is immersing yourself in a new culture. Of course, your priority is to find local ways of achieving your nutritional goals, balancing enough of the “tried and true” with the adjustments that a new country will require. You will need to identify new foods and eating styles that are compatible with your goals, and how to tap into the best of what will be on offer.

7. Organise catering ahead of time

Whether it be airplanes, hotels or host families, it pays to have other people know about your catering needs in plenty of time to adjust. Special menus and special food needs may take time to organise, and in cases where your requests can’t be met, advance warning

will allow you to consider a “Plan B”. When travelling in a large group you will be pleased to find that meals are pre-arranged and waiting for you, rather than testing the limits of your patience.

8. Make good choices in restaurants and takeaway outlets

Whether you have organised ahead of time or are faced with making decisions on the spot, you will need to exercise good judgement when eating in restaurants and fast-food outlets. Important skills to acquire are an understanding of the nutritional characteristics of menu items, and a pro-active approach to asking for what you need. Make use of the information about local cuisine provided throughout our website as we “travel” to the various corners of the world.

9. Learn smart eating skills for Athlete Dining Halls and “all you can eat” venues



A new style of eating requires a new style of behaviour. "All you can eat" and buffet style eating provides many challenges, even when it is within the confines of an Athlete Village. Eat to your plan, rather than succumb to unneeded temptations.

10. Think about the lessons learned for next time and to share with others

Don't consider the trip to be over until you've had time to "debrief". It is important to review what you learned on your travels – what worked, what didn't work, what challenges still need a good solution. Write it all down while it is fresh in your mind – your memories will fade over time. This information will provide an invaluable starting point for preparing for future trips, and for sharing your knowledge with others.

In Transit

Unusual eating times, inactivity and increased fluid loss during transit can all interfere with performance for the first few days after arrival. On tours where athletes are constantly on the road, the impact of travelling can become a long-term problem. Whether travelling overseas on a long flight, or a couple of hours by road or rail, planning and preparation are the keys to successful eating while on the move.

Meals and Snacks

Excessive consumption of meals and snacks can lead to unwanted body fat gain. Alternatively, some athletes may find it difficult to meet their nutritional needs while travelling and weight loss or poor fuel stores could be a risk. Several strategies can be undertaken to minimise these risks to performance.



- When flying, contact the airline well in advance of departure to find out if special meals are provided (e.g. low fat, vegetarian, sports), what they consist of and the timing of the meals during the flight.
- Plan your food intake in advance and decide which meals you need, and whether your own snacks are also required.
- On long flights try to adopt the meal pattern you will have at your destination. This will help to reduce jet lag and adjust your body clock.
- Forced inactivity when travelling often leads to boredom. Pack plenty of activities to keep yourself occupied. Reading material, travel games, playing cards, and music can all help to fill in the hours of unaccustomed "down time".
- Athletes with reduced energy needs may not need all the meals and snacks provided during flights. Drinking fluid and chewing sugar free gum can decrease the temptation to snack

excessively during flights. Alternatively, pack your own snacks and decline the in-flight service.

- When fuel needs are high, pack extra high carbohydrate snacks to supplement the food provided in-flight.
- When travelling by road, pack your own supplies, stick to your nutritional plan and avoid being tempted to stop at shops along the way.
- Pack a supply of snacks in case unexpected delays cause you to miss meals. However, don't be tempted to eat them just because they are there. Good snack choices include cereal bars, sports bars, liquid meal supplements, fruit, and dried fruit & nut mixes. High fibre snacks can be useful (e.g. wholemeal breakfast bars, dried fruit) if you tend to become constipated on long journeys.

Fluid

Air-conditioned environments and pressurised cabins increase fluid losses from the skin and lungs. The risk of becoming dehydrated is high, especially when travel times are long. Symptoms of dehydration may include headaches, tiredness or slight constipation. Although fluid is provided regularly when flying, the small serve sizes are usually insufficient to maintain hydration. When travelling by road or rail, hydration is entirely your responsibility.

Take your own fluids when travelling. Water, sports drinks, juice, soft drink, tea and coffee are all suitable. Sports drinks provide a small amount of sodium that helps promote thirst (increases the volume of fluid consumed) and decreases urine losses (reduce trips to the toilet). Caffeine-containing fluids such as tea, coffee and cola drinks may cause a small increase in urine production, but can still

assist with overall fluid balance. Try to drink adequate volumes (e.g. 1 cup per hour) to maintain hydration. Avoid alcohol when travelling.

Travel Supplies

Snacks are an important component of the eating plans of most athletes. Regardless of whether you are self-catering or relying on others while 'on the road', it is a good idea to take extra food to supplement your meal arrangements. Depending on the travel destination this may consist of:

- favourite foods which are unlikely to be available at the destination
- supplies to compensate for poor nutritional quality or unsafe meals
- snacks to supplement shortfalls in organised catering
- special sports foods or supplements which are a regular part of your nutritional regime or competition preparation

Useful Food for Travelling

General Snacks

- cereal bars
- dried fruit and nut mixes

When Food Availability is Limited or Food Safety is an Issue

- dehydrated meals e.g. low fat 2 minute noodles, flavoured rice
- canned meals e.g. spaghetti, baked beans
- snack packs of fruit
- juice concentrate
- foil sachets of tuna or salmon
- spreads e.g. Vegemite, jam, honey
- dried biscuits, crackers or rice cakes
- long-life cheese (e.g. cheesesticks)
- powdered liquid meal supplements

Sports Foods

- powdered sports drink
- powdered liquid meal supplements
- sports bars
- gels

Useful Equipment for Travelling

- single cup heater to boil water
- snap-lock bags or plastic containers
- large plastic bowl and cutlery
- herbs and spices stored in film canisters to jazz up "ordinary" tasting meals

The weight of food supplies needs to be considered, especially if flying. Research the food availability at your destination as thoroughly as possible to avoid taking unnecessary supplies. Pack powdered or concentrated products where possible e.g. powdered milk, concentrated juice, dried fruit. Remove any excess packaging from products – snap-lock bags are a good lightweight alternative to tins jars and boxes.

Divide supplies among team members or send a package of supplies ahead to avoid paying for excess baggage. Remember to check with customs/quarantine regarding foods that are restricted from entering certain countries. Check to see if any taxes will be applied.

Food Safety

The last thing an athlete needs is to get sick before a major competition. Unfortunately exposure to a new environment can make this a real possibility, especially when food hygiene standards, sanitation and water quality are poor. There is risk of food, and water borne illness everywhere you go, even with local travel. Communal living, the stress of travel, and a heavy competition workload can reduce your immunity, therefore increasing your risk. Being aware of the risks

and behaving responsibly will improve your chances of an illness-free trip.

Water and Drinks

It pays to be cautious with water safety. When in doubt about the water supply:

- use bottled or boiled water for drinking, cleaning teeth and rinsing equipment used for eating or food storage (NB. Water should be boiled for 10 minutes to kill all bugs)
- consume fluids from containers with unbroken seals that have been opened in your presence – wash the external surface of soft drink cans before drinking
- avoid ice in drinks
- drinks such as coffee and tea made from boiled water are usually safe, however the added milk may be a source of bugs
- avoid drinking water from the shower/pools etc.

Food

The following tips will help minimise contact with food poisoning bugs:

- Only eat food that has been cooked, can be peeled or has been washed in safe water.
- Food should either be steaming hot or refrigerated. Avoid luke warm food from bain maries. Only eat foods that have been cooked thoroughly.
- Take care with, and perhaps avoid, fish, pre-prepared salads, soft poached eggs, rare meats, hamburgers, stuffed meats and pastries with cream fillings – these foods are common sources of contamination.
- Avoid any fruit with damaged skin. Avoid citrus fruit and melons from street vendors as they may have been injected with water to make them heavier.
- Avoid buying food from street side vendors. Choose food premises that look clean and busy. Check to see that raw and cooked food is kept separate at all times, cooked food is steaming hot and staff use serving utensils to handle food.
- When eating from buffets, ensure chilled food is refrigerated or stored on ice and hot food is kept steaming hot. All dishes should have their own serving utensil and food should be protected from coughs and sneezes by a guard or lid.
- Eat food bought from takeaway outlets immediately.



General hygiene

- Always wash your hands before eating or handling food, and after going to the toilet or blowing your nose.

- When preparing food, always keep raw foods like salads away from foods that need to be cooked like meat, to avoid cross-contamination
- Use separate chopping boards and cooking utensils for cooked and raw foods
-

What to do if you get sick

- see the team doctor if available, otherwise the manager or coach
- drink plenty of fluids as dehydration is the main danger with diarrhoea
- take an oral rehydration solution, to compensate for lost minerals and salts from severe diarrhea stick to a bland diet as you recover. You may need to avoid milk, icecream and other foods containing lactose, at least in large quantities for a day or two – this includes most liquid meal supplements as well.
- rest, so that you can recover more quickly to get back into training
- think about what food you have eaten in the last two days to determine what may have caused the problem. Avoid and warn others about this food as well.
- do not handle or prepare food for others while sick.





Association of Rowing Coaches

Membership Application Form

First Name: _____

Surname: _____

Gender: _____

Nationality: _____

ID Number (RSA): _____

DoB: _____

Postal Address: _____

Cell Phone: _____

Email: _____

Club/Institution: _____

Volunteer/Half paid/Full Paid: _____

Coaching Qualification Level: _____

Representation: International/National/Provincial: _____

This form must be completed and returned by fax to Jamie Croly (National Secretary) at 011 781 2987 or by Email at jcroly@stithian.com. You will be notified by email of the receipt and acceptance of the membership application.

Membership fee of R100.00 per year will be invoiced after membership has been accepted and processed.