

THIS MAN CAN MAKE YOU FASTER

WORDS: JONATHAN BENTMAN IMAGES: REDEYE

**TOP MOTOCROSS PHYSIO BOFFIN STEPHAN NUSSER
REVEALS THE 16 UNCOMFORTABLE TRUTHS BEHIND RIDER
FITNESS AND HOW YOU CAN TRAIN YOUR BODY TO WIN**

Motocross is one of the toughest sports known to mankind, requiring a mix of highly exacting skills and fair dose of raw bravery that goes far beyond what average man could contemplate. Certainly no other motorsport asks more, physically and mentally, of a competitor.

And yet the reality is we still know very little about the sport's exact physical requirements – they've yet to be properly measured, calculated, even estimated. And if you ask the top teams about their riders' training, they hold their hands up – not their responsibility. When you consider the level of influence the rider and his fitness has on the team's results, then this would seem crazy, if not downright negligent.

So we figured it was time to see if we could get to the bottom of the fitness-training business. We went to Stephan Nüsser MSc, a highly regarded German sports scientist, formerly a director of performance diagnostics at the German Sports University in Cologne and today a

specialist in motocross fitness as well as looking after sportsmen in enduro, BMX, cycling and running. Nüsser is a former national level motocrosser himself, and was the man training Josh Coppins in what was so nearly his championship year in 2007.

What Nüsser has to say makes stark reading. Essentially, if you haven't got the lungs, all the heart in the world will do you no good. Motocross training should be a professional business, and here are 16 reasons why.

1. IT'S FUNDAMENTAL – NO TRAINING, NO CHAMPIONSHIP

The season starts and you've not completed your training programme – what have you got to take into the season: excuses. Nüsser explains, if you're looking for examples of riders who haven't done their job over the winter then look for those who have a performance dip about four races into the season.

"Training should be viewed as a rolling programme, over a number of years, not

just a momentary, winter thing. So when a rider arrives at the opportunity to win a championship – Stefan Everts was a good example of this – they've got themselves so physically dialed in so as to be unbeatable."

2. THE RIGHT MENTALITY WORKS – IF BACKED UP BY FITNESS

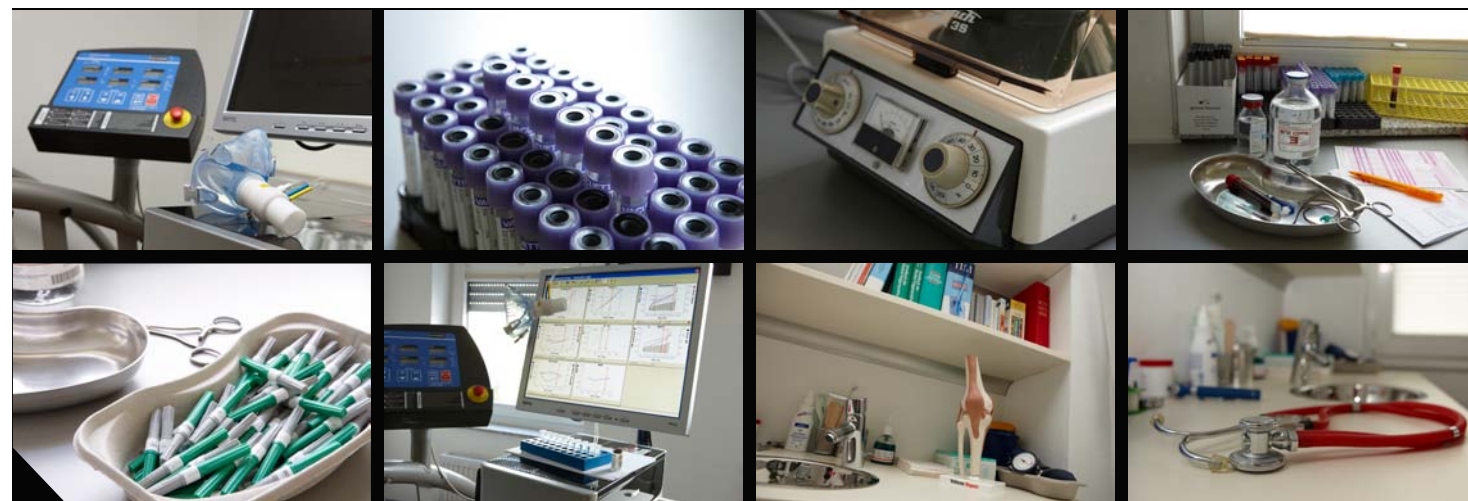
"It's proven that the more tired your body is, the more your technical performance and co-ordination suffers. Having the movement, the mental image of the control action, in your head and then doing that in practice becomes an issue.

"The mental state is, all the same, really important, at times maybe even more important than the physical aspects – if you're really strong mentally it can cover some physical weaknesses.

"An example is Josh in 2007. Josh wasn't always faster or fitter than rival Steve Ramon but he simply couldn't handle the thought of being beaten by Ramon – so that made him stronger and was also why he won some



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aces ahead of Ramon, because he had so much desire to beat him.

"But iron will can't overcome serious shortcomings. If someone always crashes in the last 10 minutes of a moto then, whatever his excuses, I would say that the crash was a symptom of a physical or concentration problem, which is for sure connected."

3. VO2 MAX DOESN'T LIE, BUT IT DOESN'T GIVE THE WHOLE PICTURE EITHER

The VO2 max test – where a rider runs on a treadmill and his oxygen consumption measured – is used to benchmark fitness. The average person processes 40 millilitres of oxygen per minute per kilogramme body weight. The higher the value the greater the overall endurance capacity of the person. Top cyclists can register a score as high as 80-90. Top motocrossers typically score 60-65.

"You can't say cyclists are fitter, though. It's important to ask what's required from the sport in question and not always look at other sports as a measure. But you do need a good level of overall endurance to build on to achieve the bike fitness that's required."

"So the VO2 max is not a true indicator as it measures only endurance, we need to also look at strength and flexibility."

4. RIDING ON ITS OWN WILL NOT GET YOU FIT ENOUGH

Nüsser explains that he sees a rider's fitness comprising two parts: general fitness and sport-specific fitness.

"To be awesome on a run or cycling is not enough, you need to be bike fit too – a combination of the two.

"But the general fitness is the base on which the bike fitness stands – you need the overall fitness to then develop riding fitness, without that base you won't develop your riding fitness.

"Riding alone will not achieve the fitness level required to be able to race motos every weekend for a whole season. Even if you trained by riding five days a week, say two hours each day – of which maybe 90 minutes (max) will be at a suitable level – that only makes at most nine hours training a week and that's simply not enough."

5. WINTER IS WHEN ALL THE HARD WORK HAS TO BE DONE

"Winter training has to be intense to get to the required fitness level to start the season. As much as possible needs to be done then as come the season a lot of time is lost to recovery time outside of the races. A fit rider, after racing the weekend may need to rest until Wednesday before he can start training again. Later in the season he may even need the whole week to allow his body to recover."

How intense is the training? Nüsser runs a winter camp for riders and the programme breaks down to something like: two weeks, 25 hours of training each week, three training sessions a day, typically something like swim/cycle/soccer. The riders are then encouraged to continue training on the basis of 20-25 hours per week for the rest of the winter. This compares to triathletes who train as much as 30 hours per week. Nüsser stresses the importance of sports-specific focus on training – majoring on leg strength, lumber strength and endurance.

"You have maybe four months for preparing your endurance fitness, from November to the end of February. But the fitter you are the harder

it is to improve your performance in just those four months. Motocross training is tough because you are constantly running out of time. Once the season has started you can't do lots of endurance training as you are riding, travelling, or at the races. Whereas a cyclist, typically with less races, with more sport-specific training available year round, can continue to lift his fitness throughout the year."

6. THE BASE FITNESS COMES FROM LOW INTENSITY TRAINING – WITHOUT IT YOU'RE SCREWED

Base training is generally done at lower intensities over a long term. Short term fix-its usually result in short term results.

"Training wise, in a short period of time with just short high-intensity training you really

can lift your performance. But the peak of that performance will only stay for a very short time and you can't maintain that high peak for months or 10 weeks even, it's just for two to three weeks and then the performance goes down. To have a more or less constant performance over the whole season you need a good base and that you get through a lot of volume. And to get a lot of volume you have to be careful with the intensity.

"And this is not just over one year, your performance increases over many years. It's a long path to peak physical fitness.

"My experience with Josh was that he came to me already at a good level and we were able to build on that for the next five years. If you have someone at an average level you can still keep improving their fitness for six to eight years. Take someone who starts with you at 16, like say Ken Roczen, then you can improve their fitness for 10

years, until they are 26 - the physical peak for all men."

7. OLD SCHOOL METHODS ARE OUTDATED

That old beast-yourself-flat-out and then honk style of training is no use to a professional racer.

"Yes, it will develop your fitness a little bit, but only to a certain stage. You have to see where you've come from. If you're an absolute beginner you can do anything and you will improve, you can train clever, you can train stupid – you will see improvement simply because you are doing some training rather than no training. But the fitter and the higher the level you are at, the more and more difficult it becomes to make improvements."



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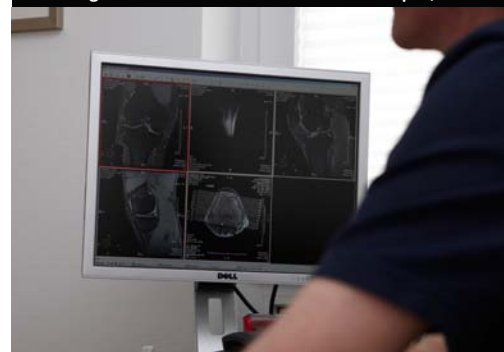
1 SUPERFIT

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"The fluid in the body has a certain density. Plain water has less density. So the body always tries to have the densities balanced, so if you just drink water which is low density and you have body fluid that is high density the body takes density from the body fluid to get the water that you just drank up to the same level. So you can lose body water trying to get the water you just drank up to the same density. "You can drink water, but together with sports drink, or juice, mix it up a bit."



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16. WE KNOW SO LITTLE

Nüsser is dismayed that so little research has been done on rider fitness and training. Compared to the approaches taken in athletics, in cycling and many other sports, so much of what's taken as read in motocross is based on nothing more than hand-me-down examples of previous generations of riders. Given the R&D that goes into the bikes, that no similar research is conducted on the riders' performance does seem a bit out of kilter – wouldn't you say?

"We really need to do more research to understand the sports-specific demands and then with the conclusions we can optimise training, optimise nutrition and optimise recovery. If you look at running or cycling there is so much research done in these sports, there's nothing in motocross yet we're still comparing our riders' fitness to cyclists or runners. If we're to market motocross widely as a professional modern sport, to call our riders 'athletes' isn't it time we addressed this imbalance of knowledge?"

and not just starting some exercise not knowing what to do next month. It really helps to have an overview of 12 months. For example: this is the prep period, the pre-season period, the race period. They must have an idea of what they must do in each period."

12. NUTRITION IS ABOUT MORE THAN JUST PASTA

Nutrition is a hugely important subject but one that's again severely neglected. Nüsser says in his experience it's an unholy struggle to change a rider's nutrition routine. Why? Because it's very difficult to take control of it, to have someone monitor what the rider eats during each day.

"It's about eating a good combination of everything and not touching fast food. But that's a problem because the riders are so much on the road, eating in hotels, eating at airports, so it's not so easy for them to have the proper food all the time.

"At the races it's just as problematic. The rider is working at a really high intensity. The first race, depending on the course, they'll use up a lot of carbohydrates. But when it comes to recharging there's a problem. From the stomach and the intestines you have a limitation on the absorption of carbs. It's between 60 and 80 grammes per hour you can pick up. Given that rate of absorption there's little point in eating a kilo of pasta when you can only absorb 60-80 grammes in the time between the first and second moto."

13. THE BANANA IS RUBBISH, TOO

"I see many riders eating bananas as an energy fix. It offers the right kind of energy but not enough. Today it's been superseded by the likes of the PowerBar. I still see riders eating a sandwich, too, between races and that's not an appropriate delivery of energy either in such a short time. Products like the PowerBar are specifically designed to have a quick absorption in the body and this is the reason you see so much of them in sports such as cycling and triathlons."

14. QUALIFYING RACES IMPACT RIDER ENERGY FOR THE GP MOTOS PROPER

The introduction of the 20-minute qualifying race on Saturday has had an unquantifiable impact of the riders' energies come the Sunday motos. Nüsser thinks the impact is quite significant.

"The whole programme that the riders do on Saturday costs a lot of energy, no question. They have to make sure that they have the proper food on Saturday night to recover, but even then I'm not sure they can refuel on everything they used on Saturday, maybe already they go in a little minus on Sunday morning and then they're still not able to pick it up again.

"Riders and teams need to look into this refueling, to get the right mixture of carbs and proteins. Because the riders will have a lot of cells destroyed from the riding so they'll have a lot of rebuilding processes going on in their bodies after the ride. So therefore they need more proteins and it's quite likely proteins are more important than the carbs in this situation."

Which could mean it's back to steak over pasta for Saturday night!

15. WATER IS RUBBISH FOR REHYDRATION

A common big mistake is to just drink plain water after a race. You can in fact come to a stage where you instead dehydrate by just drinking plain water.

they should be you'd be thinking you'll have to compensate for that with more training. But do more training and you mess up your recovery and get even more tired and fade even quicker.

"In situations like this you just have to be clever, don't train too much and make sure you recover enough. The only reliable plan is to cruise the season and try and change the preparation for the next year. In the meantime try to make recovery as good as possible and watch the training intensities, the nutrition, the fuel intake, but more than anything make sure you have rest days."

11. FEW RIDERS REALLY UNDERSTAND FITNESS

Many pound out the miles, running here and there. They diligently go to the gym and push a few weights. But how much do they really understand what they should be doing, when, and how often?

"At GP levels the riders need to have everything right. But few do. The riders need a more scientific way of controlling their training, monitoring heart rate, taking performance tests, having regular blood tests to see if everything is physically all right.

"With the blood tests you can also see if they are doing too much training. So you have an overtraining control unit. And you must have an experienced trainer to get the right information.

"There is so much to balance – what time they should do their base training, the low intensity, what time the greater intensity. What mix of fitness training and riding training they should have? How to structure their riding training – longer motos, shorter motos? That's all quite complex and the riders should be sitting down in October and making a plan for the whole year

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8. RECOVERY TIME IS UNDERVALUED

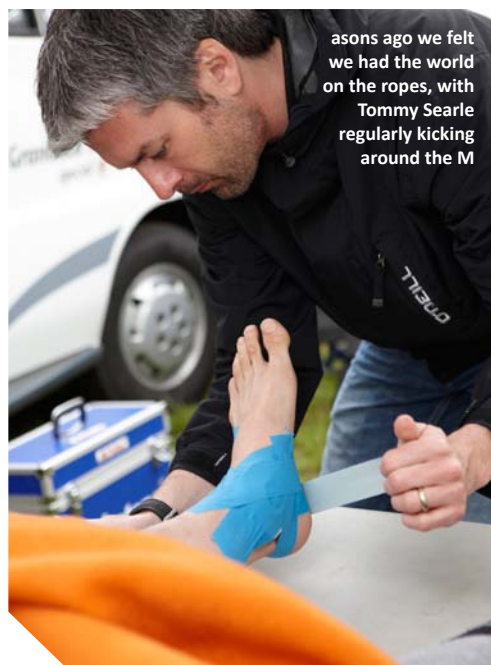
"It's a fact that a GP rider cannot recover overnight. You do need to take the Monday off and literally do nothing to let your body recover. And Tuesday sometimes, too. If you speak to the riders they always say Tuesday is the worst because on Monday you are still fired up after the race – it really kicks in on Tuesday.

"And here's a very common mistake – many riders will walk around doing shopping on their rest days. But then that's not a recovery day. Not everyone can cope with the discipline. One of my riders, Marcus Schiffer, he can't do it. If I tell him to stay home all day, he goes nuts - he needs to be doing something. It's easier for the older riders because when you are older you recover slower and so you became more aware of getting in your recovery times."

9. REGULAR TISSUE DAMAGE TO MOTOCROSSERS SHOCKS DOCTORS

You need those two days to let your body repair its tissue damage. Blood tests taken in this time have revealed the huge amount of tissue damage simply riding brings on. Regular doctors are shocked by the readings, all created by the pounding from the jumps and bumps and vibration from the bike.

"Basically a lot of tissue is damaged and destroyed. We're not talking ripped muscles but microscopically there's really a lot of damage. With blood tests I can measure the extent of muscle damage. And after a race you get really high values, if normal doctors see these results they get scared, they don't know what's happening. But for me, I have seen so many high



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values for motocross riders, it's normal.

"The dimension of damage or strain to the body is underestimated. I think it's very sports specific, although not proven or tested, but what's important is the load after the jumps, and the vibration coming from the bike. If you jump off a chair 50 times a day that'll come close to a simulation of what goes on for the body."

10. MID-SEASON TRAINING BURSTS CAN DO MORE HARM THAN GOOD

"When you really fade in the races it means you are going really deep and so you'll need a lot of recovery. But if your results are not where