

# Suspension mountain bikes go a ways to suspend pain

by Edmund R. Burk

During many of my presentations to cycling clubs and fitness groups, I often hear from people that they would love to ride their mountain bike longer and on a little more technical terrain and experience more of the backcountry.

But they always feel after several hours on their mountain bikes they just become too sore and fatigued from riding rough trails and hitting rocks, or they have a chronic back problem that does not allow them to ride off-road.

They also do not like the experience of coming down a trail and not being in complete control of their bikes.

I tell them the answer is a suspension mountain bike. A well-tuned suspension system absorbs many small bumps and can take the major jolt out of holes and rocks. It also will help a bicycle follow the contours of the terrain rather than skipping over them and losing traction.

But the best advantage to a suspension system may be in aiding the arms and legs by increasing control and comfort, especially when you are seated. Suspension allows you to relax, conserve energy and ride in more comfort.

Recently, a study conducted by Dr. Frobose from the German Sports University of Cologne confirmed my observations. The goal of the study, conducted by Dr. Frobose and RockShox, a Colorado Springs-based manufacturer of bicycle suspensions, was to learn more about the affect of absorption of hits and vibrations on the human body while riding various mountain bike configurations.

The same tests were conducted on bikes with front suspension only, bikes with front suspension and a suspension seat post, full suspension bikes and a totally rigid bike ridden on a specially designed testing apparatus that replicated shocks felt on a trail. Monitoring devices (accelerometers) were placed on various parts of the body.

The average reduction in impacts and vibrations throughout the whole body was more than 20 percent for the suspension bikes vs. the rigid bikes. The biggest benefits were found on lower backs, with a 33 percent reduction on full suspension bikes. The suspension-seat post was surprisingly efficient, with a 25 percent reduction.

Dr. Frobose sums up all these experiences by saying, "While riding a bike, shocks and vibrations mainly stress the spine and the vertebra discs. Therefore, back problems occurring during or after a ride are not simply a result of tired muscles but more the outcome of consistent stress fatigue caused by shocks and vibrations, which hammer straight into the weak spot of the human body, the back. This proves that suspension on

mountain bikes becomes more important in relation to health. If someone wants to put suspension on their bike, they should start at the rear; that is where the spine needs it most."

Spine problems and back pain are among the top health problems people have to cope with today.

Now I know many of you are saying, "But that was in the laboratory at slow speeds. Would we experience similar results riding a cross-country course at higher speeds?"

Well, several years ago, I was able to participate in a study that presented convincing evidence of the physiological and performance benefits of suspension bicycles ridden on a cross-country course.

John Seifert, Ph.D., from St. Cloud State University (Minn.), and I selected a group of 12 trained off-road cyclists and had them ride front suspension bikes, front and rear suspension bikes and bikes with rigid frames on an outdoor single-track circuit course at a steady speed of 10 mph for 60 minutes.

Mean heart rates for the hour ride were lower for the front (146 beats per minute) and fully suspended bicycles (146 bpm), compared to when the cyclists rode rigid frame bikes (154 bpm). Perceived effort by the riders also was lower for the suspended bicycles when the course was ridden at the same speed.

Another part of our initial study examined a special hormone (creatinine kinase) found primarily within the muscles that increases in the blood when muscle damage occurs during exercise or other trauma.

"When the athletes rode the suspended bicycles, the amount of creatine kinase found in the athletes' blood was significantly lower than when they rode the rigid frame bikes at the same speed," stated Seifert.

"This shows that your body will receive much less muscle damage and trauma if one selects a suspension bike while riding a rough course."

In addition, Seifert states, "Riding a front suspension bicycle resulted in faster finishing times in a cross-country time trial vs. a rigid bike in a second part of the study. This information, in addition to the heart rate and creatine kinase results, indicates riding a front or fully suspended bicycle resulted in less muscular trauma and better performance than a rigid bicycle. Trail shock detracts from speed and endurance."

The results of these studies confirm what I have suspected for years: Suspended bicycles will reduce physiological fatigue and increase comfort. Riding a suspended bicycle will increase your satisfaction, improve bicycle control, improve your efficiency and decrease muscle trauma and fatigue.

Best of all, after your trail ride you will not feel like you have just gone 15 rounds with Evander Holyfield.

For more info

For information on bicycle suspensions, visit [www.rockshox.com](http://www.rockshox.com)

[www.projekt-wellcom.de](http://www.projekt-wellcom.de)

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