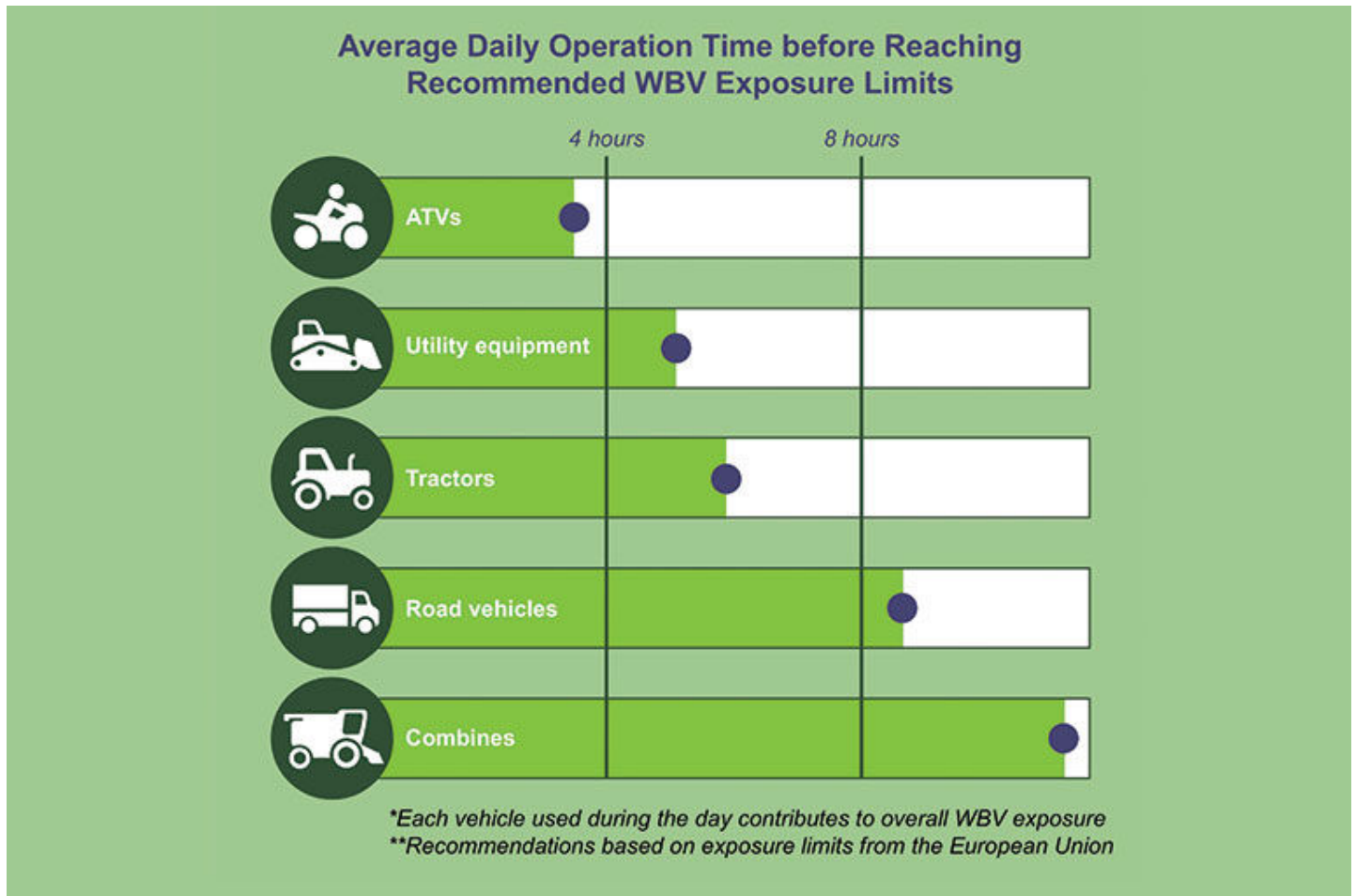


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## Safety Watch: Long hours may have hidden consequences

By Brandi Janssen

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Whole Body Vibration (WBV) levels vary between vehicles. The dots indicate that 50 percent of the vehicles tested reached EU exposure limits in the time indicated. Tractors fell in the middle, with lighter vehicles like ATVs being the worst offenders.

Courtesy Brandi Janssen

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Each season brings different tasks and equipment on the farm.

Midsummer may find you haying on a tractor all day or using an ATV to spray. In the winter months, you might spend more time in a skid steer moving feed. In the fall, you likely spend some quality time in your combine getting the harvest in.

And some days you might find yourself moving from one piece of equipment to another to get everything done.

After a typical good day of hard work, your muscles likely feel weak. Your lower back might feel stiff. You might even feel headachy or a little off balance compared to when you started work in the morning.

Even though the time spent on equipment might seem less physically taxing than other jobs on the farm, sitting on a vibrating piece of machinery for long periods of time can actually amplify your other aches and pains.

Operating nearly any farm vehicle causes the driver to experience Whole Body Vibration (WBV), which occurs when the shaking motion of the vehicle is transferred to the body of the operator. Back pain is one common ailment linked to WBV.

A person's age, weight and level of fitness also contribute to back pain.

Depending on the magnitude, frequency and duration of WBV, a vehicle operator might also experience interference with speech, muscle fatigue, increased heart rate and blood pressure and disruption of balance.

### **Bad vibrations**

Not surprisingly, WBV starts with the contact between the vehicle tire and terrain. That impact is transferred through the vehicle frame and seat to whoever is sitting on it. The vibration that the operator experiences varies depending on the vehicle and seat type, the speed and the type of terrain.

In general, someone driving a heavier vehicle equipped with a built-in-suspension seat experiences lower amounts of WBV than a person driving a light vehicle equipped with a seat bolted rigidly to the frame. And, for the most part, the faster the speed, the greater the vibration.

But a sudden change in terrain, such as driving over an obstacle or hitting a low spot in the ground, can cause sudden vibration spikes (or "mechanical shocks") similar to those experienced during collisions in football or other contact sports.

Recent research funded by the Great Plains Center for Agricultural Health at the University of Iowa measured levels of WBV in various farm vehicles. Nathan Fethke, the principal investigator on the study, found quite a bit of variation between different vehicles and the WBV experienced by the operator.

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To measure WBV, his research team traveled to farms throughout the Midwest. They attached sensors called accelerometers to over 100 farm vehicles, from combines to ATVs and fork trucks, to measure WBV levels during actual farm work.

To calculate a recommended limit for farm vehicles, Fethke used European Union standards and had to account for the wide variation in tractors, skid steers, ATVs, combines and all the other vehicles tested.

ATVs tended to be the worst offenders, and 50 percent of the ATVs studied reached the EU exposure limits for WBV before four hours. Combines, in contrast, reached the exposure limits well after eight hours of continuous operation. Tractors and utility equipment fell in the middle at about six hours.

But, Fethke notes there was significant variation among the tractors measured.

“The reality is, at least in our data, factors such as vehicle type, make, model and year of manufacture were poor predictors of WBV levels. Other than combines, the variety of vehicles our participants used to accomplish similar tasks make it difficult to suggest specific recommendations that apply to everyone,” Fethke says.

### Minimizing effects

No matter the vehicle you're operating, there are a number of ways to minimize the effects of Whole Body Vibration.

First, make sure your equipment and the seats are in good order. Tires should be properly inflated, and the vehicle suspension system should be maintained to the manufacturer's specifications.

If your vehicle has a seat with a built-in suspension, make sure it's properly adjusted for your weight so that it doesn't "bottom out" during use. Also, adjust the seat to improve your posture and use a back rest with lumbar support.

Despite what you might think, a seat cushion is unlikely to help reduce vibration. Instead, make sure the existing suspension in the seat is sound, or install a replacement seat with a suspension system.

Terrain can significantly affect vibration. Slow down when you're traveling over rough terrain and try to miss major obstacles like potholes and ruts. Take the time to maintain frequently traveled dirt or gravel paths.

Take care of your back by sitting with a straight posture and try not to twist your back while operating the vehicle.

Even when WBV levels are low, long hours of continuous operation can fatigue your back muscles. Take breaks periodically to stretch your muscles and avoid lifting heavy objects immediately after long periods of vehicle operation.

Long hours on the tractor or in the combine come with the job of farming. Unfortunately, time spent in farm vehicles can cause muscle fatigue and increase your risk of other injuries, even though it doesn't seem like you're exerting yourself. Taking some simple steps like maintaining your equipment, taking regular breaks and paying attention to the terrain you're traveling over can help keep you in good shape for another season.

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