

Collegiate Baseball

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Reduction In Power

New Bats For 2011 Will Have Less Pop, Little Trampoline Effect

□ Physicist Alan Nathan explains in detail what baseball players, coaches can expect from the new standard bats that will replace the BESR protocol.

By **LOU PAVLOVICH, JR.**
Editor/Collegiate Baseball

CHAMPAIGN, Ill. — The performance level of non-wood bats that meet the new 2011 NCAA standard is expected to be at least five to six percent less than bats utilized last season, according to Alan Nathan, a member of the Baseball Research Panel who advises the NCAA on issues related to bat performance.

The new non-wood bats which meet the Bat-Ball Coefficient Of Restitution (BBCOR) testing protocol must pass a number of performance standards, including Moment of Inertia and BBCOR.

The Moment of Inertia test prevents new bats from carrying the bulk of the weight near the handle which makes the bat swing faster than barrel weighted bats. For instance, a 28-ounce bat may feel like a 23-ounce bat to a hitter because of the weight placement in the bat.

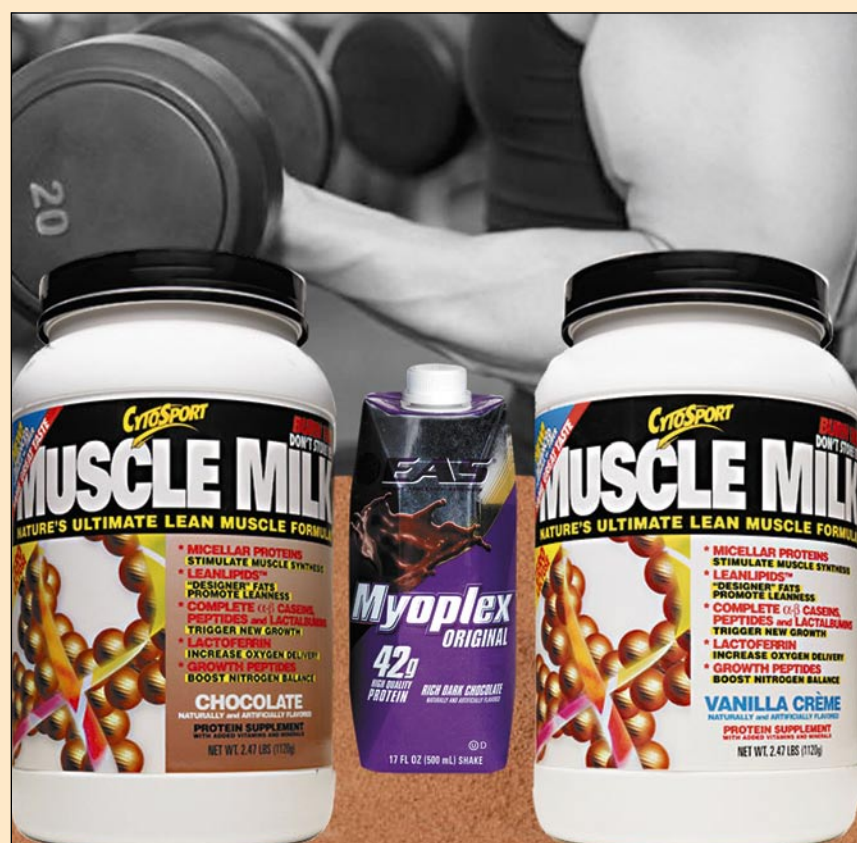
For that reason, a minimum allowable Moment of Inertia for different length bats is now in effect.

See **NEW 2011 BATS MUST PASS STRICT**, Page 2



DECLINE IN POWER — The new BBCOR standard bats, which will be used for the first time during the 2011 spring season for teams utilizing NCAA rules, are expected to produce at least a 5-6 percent reduction in power according to Dr. Alan Nathan of the NCAA Baseball Research Panel.

Arsenic, Cadmium, Lead, Mercury All Discovered At Some Level In Drinks



Protein Drink Alert: Tests Reveal Surprising Results

□ Special investigation by *Consumer Reports* shows that certain protein drinks can expose users to higher levels of heavy metals.

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YONKERS, N.Y. — The promises are enticing. Whether you're looking to shed unwanted pounds, get a quick energy jolt, build muscles, or fight the aging process, protein drinks are being boosted by some supplement makers as a scientifically proven way to quickly achieve your goals.

The products, sold as ready-to-drink liquids or powders that you mix with milk, juice or water to make shakes, attract not just athletes and body-builders but also baby boomers, pregnant women, and teenagers looking for a

shortcut to a buff body.

Some ads say that protein supplements, in flavors such as strawberry and vanilla cream, can be a nutritious and time-saving snack or meal replacement.

Marketing for Energy First Pro Energy Whey Protein Isolate says the protein supplement is "ideal" for pregnant women and growing children, and also offers this promise for aging adults who use it: "You will rarely if ever be sick and you will begin to look and feel years younger."

In a testimonial for BSN Lean Dessert Protein Shake, "fitness celebrity" Jennifer Nicole Lee says, "Being a busy mom with 12-hour workdays, I rely upon my lean Desert Protein to get adequate amounts of protein without wasting time on creating complex meals..."

Another product, Muscle Milk, boasts on its website: "Designed after one of nature's most balanced foods: human mother's milk..."

But our investigation, including tests at an outside laboratory of 15 protein drinks, a review of government documents, and interviews with health and fitness experts and consumers, found

See '**CONSUMER REPORTS**', Page 8

TEST RESULTS ARE IN — *Consumer Reports* magazine reported in their July edition that EAS Myoplex Original Rich Dark Chocolate and Muscle Milk Chocolate and Vanilla Crème can expose users to elevated levels of heavy metals when they consume three servings a day. Many college and high school baseball players drink protein shakes.

INSIDE COLLEGIATE BASEBALL

Web Site: www.baseballnews.com

New 2011 NCAA Rules Explored
Ty Halpin explains that speed up rules will be enforced to help games move along at crisper pace/**Page 3**

2010 Summer Baseball Results
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High School Rules For 2011
High performing non-wood composite bats will not be allowed to be used in competition/**Page 14**

New 2011 Bats Must Pass Strict Standards For Play

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The BBCOR test essentially limits the trampoline effect of bat barrels to that of wooden bats.

With the new changes, non-wood bats utilized in 2011 and beyond with the new BBCOR standard should perform very close to wood bats, according to Nathan.

The new bats will be less potent than non-wood composite bats utilized during the 2009 season which were outlawed by the NCAA Rules Committee for the 2010 season.

Those bats, which were NCAA legal at the time of purchase, could be artificially aged by a process called "rolling" which resulted in a boost in bat performance.

Bats were compressed along the barrel between top and bottom nylon rollers or hard rubber rollers.

The resin and glue broke up as the rollers were tightened down in a precision process over the entire barrel of the bat leaving the area more flexible with a maximum trampoline effect when balls hit the barrel.

The BBCOR standard eliminates the possibility of bats performing at a higher level by rolling non-wood composite bats since this has been factored into the new protocol.

Nathan, who has been a Professor of Physics at the University of Illinois since 1977 with a specialty in experimental nuclear/particle physics and written over 80 articles in scientific journals, took time out of his hectic schedule to explain how the new BBCOR testing standard on non-wood bats will impact teams which utilize NCAA rules next season.

Composite Bat Testing?

Nathan was asked if non-wood composite bats will be approved for NCAA play in 2011.

"There is no question hollow composite bats will be able to meet the new BBCOR performance standards," said Nathan.

"That is well within the means of bat manufacturers. The problem with the hollow composite bats used during the 2009 season was that they got better with use. It is pretty well understood how the science of that happens. What clever people discovered was that they could accelerate the break-in time by 'rolling' these types of bats. That's an illegal act.

"When the problem was realized, there was a moratorium put on these bats in the fall of 2009 and through 2010. We understand how metal bats work and how to regulate them. With hollow composite bats, it has been more difficult to regulate them with their performances changing.

"But we came up with a way to do it. The way we did it was to perform our own accelerated break-in tests by rolling bats. We test the hollow composite bat, roll it, test it again and roll it and repeat that procedure until the bat fails as it breaks or cracks.

"At no time during that process can the bat exceed the BBCOR limit. In essence, the hollow composite bats get better and better until they fail. Just before failure, the bat performs at its highest level. We are saying that at the bat's highest level, it must be below our BBCOR limit."

Nathan said this procedure has been in effect for amateur softball to regulate non-wood composite bats.



ALAN NATHAN

"We are trying it out with baseball for the first time, and we will have to keep tabs on what is going on to see how well the procedure works. It is a fairly detailed procedure on what we actually do. Hopefully this will fix the problem. If we need to do something else, we will be prepared to do it."

Nathan was asked how closely the new BBCOR approved bats will perform to wood bats.

"Very close. When the standard was set up, we had a decade worth of data on how non-wood bats performed and how wood bats performed.

"With the BBCOR approved bats, the average seems to be .48 or .49, and at the very upper level, .50. The limit was at .50.

"What these figures mean is that there will be no trampoline effect for the new non-wood bat barrels. From a trampoline aspect, the barrels will react just like wood. A wood bat is essentially a perfectly hard surface. When a ball hits a wooden bat, it has the same trampoline effect as a ball hitting a massive, rigid floor.

"In the past when a ball hit a hollow non-wood bat, then the surface of the bat compressed a little bit. Some of the ball energy compressed the barrel wall of the bat by a little. The net amount of energy lost in that collision was reduced, so you got a bigger bounce back.

"The trampoline effect can really be seen if you bounce a ball off a tennis racket compared to a rigid floor surface. The ball will bounce much higher off the tennis racket.

"The technology of creating a high performing non-wood bat has been to find alloys of aluminum that make the walls thinner and thinner so you have more and more of that trampoline effect without denting the surface.

"When hollow composite bats first came out, it was an entirely new technology. It almost seems limitless on how big of a trampoline effect you can get. When the first Miken bat came out, representatives of other bat manufacturers were in awe of how far players could hit balls with the hollow composite bats. Miken was one of the pioneering companies making composite bats. Now all of the bat companies are making hollow composite bats.

"Since there will be no trampoline effect for the new non-wood barrel bats, the aluminum only bats must have thicker walls in order to comply. In the case of hollow composite bats, just like manufacturers can ramp up the trampoline effect, they can reduce

Physics Of Baseball

CHAMPAIGN, Ill. — Alan Nathan, who has worked on the Baseball Research Panel that advises the NCAA on issues related to bat performance, maintains a unique physics of baseball web site.

It can be accessed by going to: <http://webusers.npl.illinois.edu/~a-nathan/pob/>

Nathan also wrote a paper last January in *Baseball Analysts* on Comparing the Performance of Baseball Bats. Go to the following internet site for that story: http://baseballanalysts.com/archives/2010/01/comparing_the_p.php

the trampoline effect with various tricks. The bat manufacturers won't have any trouble satisfying these new standards."

Performance Of New Bats

Nathan was asked what reduction in performance the new BBCOR bats will yield to hitters in 2011?

"With the previous standard (BESR), the best performing non-wood bat outperformed wood by about five percent and maybe as much as six percent.

"That five or six percent will now be reduced to zero percent with the new BBCOR bats. Roughly speaking, that translates to about five miles per hour less off the new bats which is the same as wood bats. Currently, BESR certified non-wood bats outperform wood bats by five miles per hour. In effect, what we are doing is removing that five miles per hour gap. Non-wood and wood will perform at the same level in terms of batted ball speed with the BBCOR standard in place."

Nathan was asked how a five percent reduction in bat performance will impact offenses.

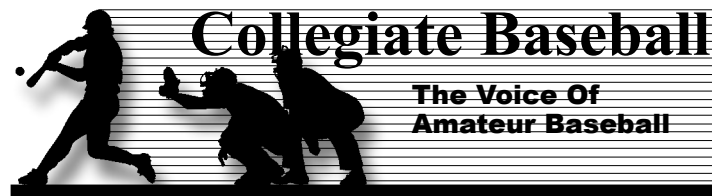
"That's a very difficult question to answer. But one thing is sure. There will be fewer home runs. However, it is not clear that batting averages will come down. Despite the fact that the BBCOR standard bats will in theory be the same as wood bats, there are still differences between wood and non-wood bats.

"The Moment of Inertia (MOI), or swing weight of a bat, will be less than a wood bat. This means the bat will be more easily maneuverable.

"It doesn't mean there will be any advantage when it comes to ball speed off the bat. In fact, there is no advantage with the minimum allowable Moment of Inertia figures we have in place for the different length non-wood bats with the new standard. A batter may get a higher swing speed with a lower MOI bat, but that is almost completely compensated by a less effective collision with the ball because there is less weight behind that collision.

"The effect of MOI on bat speed is minimal at best. However, there is a positive benefit with a lower MOI in that a batter will have a quicker bat. You can wait on the pitch a little longer and adjust your swing once you have committed to the swing. You can do this more easily with a non-wood bat that has a lower MOI than with a wood bat. Even though you might not hit the ball any harder with a non-wood bat, you might make good contact more often."

Nathan was asked if the MOI figure for every new approved bat will be made public.



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It is fairly easy to get the MOI number for softball bats on the market which allow batters to know what swing weight will be better for them than other bats even though bats may be the same length.

"Maybe manufacturers ought to put the MOI figures on their bats. Once a hitter realizes that the MOI determines how the bat feels to him, then he can go looking for a bat in that range of MOI. It would certainly save him a lot of trouble when he is trying out bats from different manufacturers. We aren't requiring any manufacturers to put the MOI figures on bats. But it might not be a bad idea if manufacturers do that to help hitters."

Nathan said when bats are tested at the Baseball Research Center in Lowell, Mass., they are stationary with no movement.

"On the field, a baseball is moving and a bat is moving," said Nathan.

"What matters from a physics point of view when measuring performance is that the relative ball/bat speed be reasonably close in laboratory tests. In the field, the batter might be swinging 65

mph, and ball might be coming in at 80 mph. Combined, that is 145 mph. So we fire balls out of a high speed air cannon into a stationary bat somewhere between 135-140 mph.

"A lot of work has gone into determining the appropriate instrumentation to find out how bats react to balls coming into the barrel at that speed.

"We measure the speed of the ball as it approaches the bat. When the ball hits the bat, we measure the speed as it bounces back. All of our measurements in the BBCOR come from taking those numbers and running them through different equations."

BBCOR Protocol History

Nathan said that the switch from the BESR standard to the BBCOR protocol was first recommended by the Baseball Research Panel which he serves on.

"Our committee felt a BBCOR standard was a better correlation on how the bat performed in the field than the BESR. However, the decision of where to draw the line in bat performance was made by the NCAA Rules Committee."