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## **Information Collected Concerning Wood and Non-Wood Bats**

➔ Indicates information added after the initial posting Thursday, April 15, 2010

### **CURRENT NFHS RULES FOR HIGH SCHOOL**

#### Rule 1-3-2

The bat which may be a wood or non-wood product shall be a smooth cylinder implement with a knob that is permanently and securely fastened. All non-wood bats shall meet the Ball Exit Speed Ration (BESR) performance standard, and such bats shall be labeled with a silkscreen or other permanent certification mark. No BESR label, sticker or decal will be accepted on any non-wood bat. There shall be no devices, attachments or wrappings that cause the handle to become flush with the knob. Molded grips are illegal. Effective January 1, 2012. The bat, which may be wood or non-wood product, shall be a smooth cylinder implement from the top of the cap to the top of the knob. The cap of the bat and knob of the bat shall be permanently and securely fastened. All non-wood bats shall meet the Batted Ball Coefficient of Restitution (BBCOR) performance standard, and such bats shall be labeled with a silk screen or other permanent certification mark. The certification mark has to be rectangular, a minimum of a half-inch on each side and located on the barrel of the bat in any contrasting color. There shall be no devices, attachments or wrappings that cause the handle to become flush with the knob. Molded grips are illegal.

#### Rule 1-3-3

Only bats may be used in loosening up (including weighted bats for this purpose) at any location. Only bats and devices designed to remain part of the bat, such as weighted bats, batting donuts, and wind-resistant devices are legal at any location. A non-wood bat must have a safety grip of cork, tape, or composition material. The grip must extend a minimum of 10 inches, but not more than 18 inches, from the handle end of the bat. Slippery tape or similar material shall be prohibited.

#### Rule 1-3-4

A wood bat may be roughened or wound with tape not more than 18 inches from the handle end of the bat. No foreign substance may be added to the surface of the bat beyond 18 inches from the end of the handle.

Each bat shall be:

In diameter at thickest part: (wood) 2.75 inches or less

In diameter at thickest part: (non-wood) 2.625 inches or less

In length: 36 inches or less

In weight: A bat shall not weigh, numerically, more than three ounces less than the length of the bat (e.g., a 33-inch-long bat cannot be less than 30 ounces).

#### Rule 1-3-5

Bats that are altered or that do not meet the rule specifications are illegal (See 7-4-1a). No foreign substance may be inserted into the bat. Bats that are broken, cracked or dented or that deface the ball, i.e., tear the ball, shall be removed without penalty. A bat that continually discolors the ball may be removed from the game with no penalty at the discretion of the umpire.

#### Rule 1-5-1

It is mandatory for on-deck batters, batters, runners, retired runners, players/students in the coaches' boxes as well as non-adult bat/ball shaggers to wear a batting helmet that meets the NOCSAE standard. The batting helmet shall have extended ear flaps that cover both ears and temples and also display the NOCSAE stamp and the exterior warning statement. The .....

#### Rule 1-5-2

A face mask/guard may be attached to batting helmets at the time of manufacture. All face mask/guards shall meet the NOCSAE standard. A face .....

#### Rule 1-5-5

Defensive players are permitted to wear face/head protection in the field. If a pitcher or any defensive player wears face/head protection, its outer covering shall have a non-glare surface.

Note: Professional and minor league baseball use only wood bats.

### **ACTION**

- The NCAA has instituted a moratorium on the use of composite bats.
- NCAA still allows Aluminum bats which meet the BESR (.728) standard.
- The NCAA will require that all non-wood bats meet the new BBCOR (.500) standard starting in 2011.
- The NFHS currently requires that all non-wood bats meet the BESR standard.
- The NFHS will require that all non-wood bats meet the new BBCOR standard starting in 2012.
- The MCAL has currently placed a moratorium on all non-wood bats.
- North Dakota has banned Aluminum bats in high school competition.
- New York City has banned the use of non-wood bats in high school competition.

### **PROPOSED ACTION**

- Elliot Hopkins, NFHS administrator responsible for rule changes in baseball, will propose the consideration of mandating batting helmets for pitchers.
- The NFHS is currently seeking recommendations for rule changes. NCS is allowed to make recommendations, which are forwarded to the State Office for inclusion of possible recommendations from CA to our Section 7 representative, Rob Cuff, UT. CA will have input from Ken Allan, CIF Rules Interpreter, and a new member of the NFHS rules committee as the NFHS Officials' Assoc.
- Assemblyman Huffman, Marin County, is proposing a three-year ban on the use of non-wood bats, AB 7.

### **CASES**

- ➔ August 16, 2009 – Hiroki Kuroda, Dodgers, was hit by a line drive just above his right ear. He escaped serious injury.
- ➔ USA Today reported that Royals relief pitcher Jose Santiago was hit in the head by a ball off the bat of a Blue Jays player. No year listed.
- ➔ San Francisco Chronicle – Cubs starter Mark Prior was hit by a line drive, fracturing his elbow.
- ➔ April 29, 2007 – NY Yankee pitcher Jeff Karsten was hit by a line drive on the first pitch of the game, breaking his leg.
- ➔ Dodger pitcher Kazuhisa Ishil was hit by a line drive in the forehead, suffering a concussion and skull fracture.
- ➔ June 19, 2006 – Minor league pitcher Erik Davis was struck in the eye by a line drive.
- ➔ Testimony by Stephen Keener, President and CEO, Little League Baseball, Inc. before Joint City Council Committees regarding a possible ban on non-wood bats in youth leagues and high schools in Chicago – “Injury data has been kept on record at Little League International since the early 1960’s. Since that time, there have been eight fatalities in the Little League

program as a result of a batted ball. Six of those fatalities have come from wood bats and two from non-wood bats, in 1971 and 1973. Those occurred 20 years before the mandated Bat Performance Standard that is in place today.”

- ➔ NFHS Report on use of non-wood and wood bats in baseball. This study was conducted in the State of Illinois by the Illinois High School Association, with research conducted by the School of Kinesiology and Recreation at Illinois State University. According to Kevin Laudner, assistant professor and principal investigator for the study “There was no statistically significant evidence that non-wood bats result in an increased incidence or severity of injury.”
- 2009 – Giants pitcher Joe Martinez was struck in the head with a line drive, hitting the pitcher near the right temple.
- 1957 – Indians’ pitcher Herb Score was hit by a line drive in the right eye.
- 2000 – Red Sox pitcher Bryce Florie was struck by a line drive traveling an estimated 120 mph. The article does not say where he was struck but said his head looked like the Elephant Man a few days later.
- 2003 – Miles City American Legion baseball pitcher Brandon Patch was killed when he was struck in the temple in 2003 by a line drive off of an Aluminum bat (ball traveled at 99.8 mph). Patch died four hours later. The bat company was sued and ordered to pay \$792,000 to the estate of Patch.
- 2008 – A broken barrel of a maple bat whacked fan Susan Rhodes in the head as she sat four rows behind the visitors’ dugout at Dodger Stadium. Rhodes suffered a concussion.
- March 1, 2007 - Chris Gavora of Grapevine, TX, was hit by a line drive while hitting in a batting cage. The ball came from the next batting cage, killing Gavora.
- April 6, 2010 - Tanner Boynton, 13, was warming up and playing catch before a tournament when a ball struck him on the side of his neck. The impact severed his spinal cord. Within a short time he was removed from life support.
- Japan – seven high school players have died after being hit with balls off of aluminum bats since they were introduced in 1974, according to a reprinted story from the Charlotte News & Observer.
- According to researcher Bob Gorman – who this year published, along with his colleague David Weeks, the definitive account of baseball fatalities, *Death at the Ballpark* – nine minor leaguers and 111 amateur baseball players as young as eight years old have died as a result of beanings since 1887. More than 90 other players were killed either by pitches that hit other parts of their bodies, usually the chest, or by balls thrown by other fielders.
- March 19, 2009 – A high school baseball player hit into a steel fence support during a game, suffering head and neck injuries, unconscious when firefighters arrived at the field. The athlete was later listed in fair condition.

## **RESEARCH**

- ➔ Dr. Richard Greenwald, a member of the American Society of Testing Materials (ASTM) in 2007 stated in a hearing before the Pennsylvania House Committee on Children & Health that “Based on my research of testing experience with baseball bats, and in reviewing and analyzing data related to sports injuries in general, I would oppose any statement that linked such a limitation on using non-wood bats to injury, simply because there are no publicly available, peer reviewed scientific data to support this contention.”
- ➔ Letter written by Dr. Daniel Russell, Kettering University, to Mayor Michael Bloomberg April 6, 2007 stated the following, “With regards to the issue of safety in high school and college baseball surrounding the use of aluminum bats, there is a lot of hearsay, and an overwhelming pile of strongly opinionated anecdotes. It is a tragic (though extremely rare) occurrence when a child or young adult is killed while playing an organized sport. However, there is absolutely no scientific data to support any claim that metal bats are more dangerous than wood bats and that banning them would make the game safer.”

- ➔ Paper written by Dr. Daniel Russell, Kettering University, April 9, 2008. In the paper the following information was provided regarding reaction time of pitchers and batted-ball speeds – “I find it very hard to believe having an extra 0.020s (takes 0.095s to blink an eye) to react to a line drive would make any difference in whether or not a pitcher would be able to protect himself. When we look at the actual physical reaction times of players below, I think the inescapable conclusion must be that banning metal bats will not necessarily enable pitchers to avoid being hit by line drives hit directly towards them. The difference in arrival times corresponding to a 5-mph difference in batted-ball speeds is just not large enough to justify a claim that restricting players to using wood bats would make the game safer based on the argument that using wood bats would allow players sufficiently more time to react to a hit ball.”
- The NFHS includes input from Dr. Sherwood, the individual responsible for the testing of bats and the BESR standard.
  - The NFHS baseball rules committee also heard a presentation from Dr. Nathan, University of Illinois-Champagne, regarding the new BBCOR, a test designed and created by Dr. Nathan.
  - KLTV followed batting practice inside a batting cage and after the ball was hit, clocked the ball with their camera. It was 0.8 of a second before it reached the back of the cage. Combine that with a bat speed of 80 miles an hour, that is faster than anyone can react.
  - Baseballs are thrown at a much higher speed, but the distance from the mound to the plate is 60 ft., 6”, compared to 40 ft. in softball. At 65 miles per hour in softball you have about four tenths of a second. At 90 miles per hour in baseball you have about four tenths of a second.
  - CPSE Releases Study of Protective Equipment for Baseball – The U.S. Consumer Product Safety Commissioner (CPSC) announced that safety equipment for baseball could significantly reduce the amount and severity of 58,000 (or almost 36% of) baseball-related injuries to children each year. CPSC analyzed 88 reports it received of baseball-related deaths of children between 1973 and 1995. The following statistics were reported:
    - 68 deaths or 77 percent from ball impact
      - 38 deaths or 56 percent to the chest
      - 21 deaths or 31 percent to the head
      - 9 deaths or 13 percent to other areas
    - 13 deaths or 15 percent from bat impact
    - 7 deaths or 8 percent caused unknown
  - CPSC recommended:
    - Softer-than-standard baseballs and softballs
    - Face guards that attach to batting helmets and protect the face
    - Safety bases that release from their anchor
  - CPSE reported that baseball leads team sports in deaths to children with three to four deaths each year. The sport ranks third in annual injuries to children following basketball and football.
  - CPSC has determined that the current ASTM voluntary standard for face guards is effective in preventing facial injuries. According to the standard, the face guard must prevent the ball from touching the face.
  - Center for Injury Research and Policy (CIRP) reported June 2, 2008 that although the overall rate of high school baseball-related injuries has decreased within the last 10 years, the severity of injuries that occur has increased, according to a new study. Based on the findings CIRP strongly recommended helmets with face shields or at least mouth guards and eye protection by all pitchers, infielders and batters at the high school level. More than half of the injuries that occurred as a result of being hit by a batted ball were to the head/face and teeth and 40 percent resulted in fractures, lacerations or concussions. The study also found pitchers are not the only players at risk. Half of the injuries attributed to being hit by a batted ball were sustained during fielding.

- British Columbia Injury Research and Prevention Unit stated in their baseball injury information that in their opinion pitchers should always wear a helmet.
- USA Baseball formed a USA Baseball Medical/Safety Advisory Committee in 1989. The Committee initiated a National Amateur Baseball Catastrophic (Deaths and Permanent Disability) Surveillance Program, which has issued annual reports from 1989 through 2006.
  - Below is the data collected by the Committee:

YEAR	FATALITIES	DISABILITY	RECOVER	PARTICIPATION	INJ RATE
1989	1	3	1	3,209,255	0.16
1990	2	3	1	3,361,505	0.18
1991	4	1	0	3,946,043	0.13
1992	1	1	0	4,221,803	0.05
1993	2	1	3	4,366,899	0.14
1994	2	1	3	4,489,186	0.13
1995	3	4	1	4,615,472	0.17
1996	1	0	0	4,677,524	0.02
1997	3	3	2	4,734,999	0.17
1998	1	1	3	4,286,032	0.12
1999	1	3	2	5,369,136	0.11
2000	4	0	0	5,681,345	0.07
2001	3	0	4	5,575,830	0.13
2002	1	1	0	4,834,788	0.04
2003	3	0	7	4,844,500	0.21
2004	2	1	1	4,948,795	0.08
2005	5	2	1	4,753,880	0.17
2006	0	1	1	4,770,884	0.04
TOTAL	39	26	30	82,687,876	0.11

- Neuroscience for Kids reported in September of 1999 a survey of athletic trainers regarding mild traumatic brain injuries (MTBIs). From the collected data it was estimated that in the US there are 62, 816 MTBIs each year in ten sports. MTBI was defined as a “concussion”; a change in mental status, such as confusion or disorientation, caused by an impact to the head. Sports included baseball, basketball, field hockey, football, soccer, softball, volleyball and wrestling. 1.2% of all reported MTBIs were related to baseball; 2.1% were related to softball.
- July 30, 2001 – Thirteen boys died playing Little League baseball between 1987 and 1996, a new study showed. Ball-related mishaps totaled 15,266, and batters suffered most of those. Face and teeth injuries, mostly to fielders, accounted for 12, 306 incidents. Sliding was associated with 60 percent of accidents among base runners, and about 25 percent of injuries were considered serious such as broken arms or legs. Dr. Frederick Mueller, who directs the National Center for Catastrophic Sports Injuries, based at UNC, and also chairs the American Football Coaches’ Committee on Football Injuries, stated that contrary to some recent reports, youth baseball appears to be a very safe sport, but there are areas where injury prevention is possible. Potential benefits of safety bases, reduced impact balls and face masks are large and need more study.
- The NCAA reported in the spring of 2009, just prior to the NCAA College World Series that 80 of composite bats exceeded the current BESR test, failing the test.
- Paper written by Dr. Daniel Russell, Kettering University  
 The most comprehensive study comparing metal and wood bats under realistic playing conditions that I have come across was published by Crisco and Greenwald. Their study involved actual players swinging bats at pitched balls in a batting cage. A total of 19 players (nine minor-leaguers, six NCAA college, four high school) participated in the study, swinging two wood bat models, and five different metal bat models. The data shows an average batted ball speed for wood bats around 98.6-mph, while balls hit with metal bats averaged between

100.3-106.5-mph. None of the non-wood bats used met the current aluminum bat rules, rules established after the study.

- Paper written by Dr. Daniel Russell, Kettering University, July 20, 2009  
Do Accelerated Break-in Techniques Really Work?

Based on a recent Master's Thesis from the Washington State University, composite slow-pitch softball bats were tested brand new, right out of the wrapper. After 500 hits the bats were performance tested again. The results of all three bats showed noticeable improvement of 2.5-3.5 mph.

### **WOOD BAT BREAKAGE**

- Major league baseball met in 2008 to discuss the problem with broken bats.
- Wood bats flake, crack and produce jagged shards when they break, depending on the type of wood.
- Brian O'Nora was hit in the head by a stray bat shard in a game between the Rockies and Royals June 24, 2008.