

Virginia Tech announces football helmet ratings for reducing concussion risk

Contact:

- [Lynn A Nystrom](#)^[1]
 - (540) 231-4371
 - tansy@vt.edu
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BLACKSBURG, Va., May 10, 2011 – Virginia Tech released today the results of a new rating system of adult football helmets that is designed to reduce the risk of concussions. One currently manufactured helmet received the top "5 star" rating, and a total of five helmets received the very good "4-star" rating.

This biomechanical impact data study on football helmets represents the first time researchers have provided the public with comparative test results.

The information is based on a new evaluation methodology that incorporated eight years of data and analysis, quantifying head impact exposure and risk of concussion. The testing data showed that the overall best helmet currently available to the public is the Riddell Revolution Speed, which earned the only "5-star" rating. The next category includes five very good performing helmets that were all given a "4-star" rating: Schutt ION 4D, Schutt DNA Pro+, Xenith X1, Riddell Revolution, and Riddell Revolution IQ, according to [Stefan Duma](#)^[2] who directed the project.

"Our goal was to develop a thorough test matrix that would provide consumers with valuable biomechanical data in order to make educated decisions about which helmet to purchase," said Duma, a Virginia Tech professor of biomedical engineering and head of the [Virginia Tech -- Wake Forest School of Biomedical Engineering and Sciences](#)^[3].

"The results clearly show that the newer technologies across all manufacturers are significantly better at reducing the risk of concussions compared to the older models," Duma added. The dataset for football helmets is the first installation in the National Impact Database that will cover many sports when fully implemented.

The evaluation involved performing 120 impacts on each helmet model at multiple locations and impact energies. A total of three new helmets were purchased for each model and tested to determine the STAR, an acronym for the Summation of Tests for the Analysis of Risk value. The STAR value is the calculated incidence of concussion for one season of full participation at a collegiate level.

"We utilized over one million measured head impacts to quantify the impact exposure and concussion risk for the development of the STAR equation," said Steve Rowson, assistant professor at Virginia Tech in the School of Biomedical Engineering and Sciences. Rowson is responsible for the helmet testing and developed the methodology as part of his Ph.D. dissertation. "We perform the impacts using the National Operating Committee on Standards for Athletic Equipment drop test configuration because our data