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MLB

MLB Study Finds Lower Seam Height on Baseballs, Player Behavior Behind Power Surge

Report dismisses theory that manufacturer Rawlings intentionally ‘juiced’ baseballs to generate offense



Players hit a record 6,776 home runs in 2019. PHOTO: DAVID ZALUBOWSKI/ASSOCIATED PRESS

By Jared Diamond

Dec. 11, 2019 3:14 pm ET

SAN DIEGO—Baseballs with a lower seam height coupled with a “change in player behavior” were among the primary causes of the power surge that resulted in players hitting a record 6,776 home runs in 2019, a panel of scientists commissioned by Major League Baseball to study the issue said Wednesday.

The committee’s report attributed 60% of the spike to less wind resistance on the balls themselves and 40% to what it described as “launch conditions”—essentially differences in how batters swing.

Throughout the 2019 season, pitchers across the sport questioned whether the league instructed Rawlings, the MLB-owned company that manufactures the baseballs in a factory in Costa Rica, to intentionally “juice” them to generate offense. The report dismissed that theory,

saying that “no evidence was found that changes in baseball performance were due to anything intentional on the part of Rawlings or MLB and were likely due to manufacturing variability.”

“We have never been asked to juice or dejuice a baseball, and we’ve never done anything of the sort,” Rawlings CEO Michael Zlaket said Wednesday at the annual winter meetings.

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The manufacturing of baseballs is a more complex process than it might seem. They are stitched by hand, using natural materials. This “creates a variability in the baseball performance that is, to some extent, unavoidable,” said Chris Young, MLB’s vice president of on-field

operations and a former big-league pitcher.

MLB has no interest in changing that tradition and devising a synthetic ball that might avoid some of the unpredictability that continues to frustrate players and general managers who just want to know what kind of ball they’re using.

“One of the things we’re going to have to do as we continue this journey of discovery is accept the fact that the baseball is going to vary and the performance of the baseball is going to vary,” said Morgan Sword, MLB’s senior vice president for league economics and operations.

This marked the second study into the mysterious rise of home runs in the last two years, after a similar boom from 2015 through 2017. The first study, released in May 2018, concluded that it was almost entirely because of the aerodynamic properties of the baseball, specifically decreased drag coefficient—the ease with which the balls cut through the air. At that point, the scientists then couldn’t pinpoint a reason as to why.

The latest study comes closer to identifying an explanation: inconsistency in the height of the seams, which the professors said can have a dramatic effect on how the ball behaves.

Newly developed laboratory techniques enabled the committee to show a correlation between seam height and drag. The average seam height in 2019 was lower than 2018 by less than one-thousandth of an inch. Still, that was enough to account for 35% of the change in drag.

“This is something that escaped our observation in the preceding study simply because the equipment that we were using was not precise enough to determine that,” said Alan Nathan, a professor emeritus of physics at the University of Illinois and the chair of the study.

The problem is that the committee still can't figure out the other factors that contributed to the decreased drag. It did rule out certain hypotheses such as roundness, surface roughness and lace thickness. Further breakthroughs will require more study. Asked how long that might take, Lloyd Smith, the director of the Sports Science Laboratory at Washington State University, said, "We have no idea."

With fly balls liable to travel farther than before, batters, perhaps not surprisingly, adjusted their swings to drive the ball in the air and hit for power. The average launch angle of all batted balls in 2019 registered at 12.2 degrees, up from 11.7 degrees in 2018 and 10.1 degrees in 2015, the year MLB released Statcast, a radar system that tracks such data. Launch angle has risen every year since the creation of Statcast.

The study was less conclusive about what happened during the postseason, when home-run rates unexpectedly plummeted, prompting players and managers to say that they thought that the balls had been "dejuiced" from the regular season. The report said there was no change in the seam height in the baseballs from the regular season to the playoffs, and the committee was unable to say why the balls in October had a greater drag coefficient.

"It shows that there are things that we really do not yet understand about what are the contributing factors to drag," Nathan said.

The scientists also took a special interest in the rubbing mud that is applied to all new baseballs to make them less slick. They said that in their testing, the drag of the balls decreased after the mud had been applied, prompting the panel to recommend a more extensive study on the impact of the substance with a much larger sample. MLB is currently working on a tacky baseball that wouldn't require rubbing mud.

In addition to the mud, the committee said Rawlings should develop a system to track the dates on which balls are manufactured and shipped, and teams should log which batches are used in which games. It said that MLB should install atmospheric tracking systems in all 30 ballparks to help "facilitate determination of drag and other properties affecting performance from in-game data." Additionally, the league should consider using humidors at all stadiums to reduce variability in storage conditions.

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