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HANK AARON'S HOME COOKING

## Top Sluggers and Their Home Run Breakdowns

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**One of the qualities that makes baseball unique is its embrace of non-standard playing surfaces. Football fields and basketball courts are always the same length, but no two outfields are created equal. As Jay Jaffe explains via a look at Barry Bonds and the all-time home run leaderboard, a player's home park can have a significant effect on how often he goes yard.**

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It's been a couple of weeks since the 30th anniversary of Hank Aaron's historic 715th home run and the accompanying tributes, but Barry Bonds' exploits tend to keep the top of the all-time chart in the news. With homers in seven straight games and counting at this writing, Bonds has blown past Willie Mays at number three like the Say Hey Kid was standing still, which—congratulatory road trip aside—he has been, come to think of it.

Baseball Prospectus' Dayn Perry penned an affectionate tribute to Aaron last week. In reviewing Hammerin' Hank's history, he notes that Aaron's superficially declining stats in 1968 (the Year of the Pitcher, not coincidentally) led him to consider retirement, but that historian Lee Allen reminded him of the milestones which lay ahead. Two years later, Aaron became the first black player to cross the 3,000 hit threshold, two months ahead of Mays. By then he was chasing 600 homers and climbing into some rarefied air among the top power hitters of all time.

Aaron produced plenty of late-career homer heroics after 1968. From ages 35 (1969) through 39, he smacked 203 dingers, and he added another 42 in his 40s, meaning that nearly a third of his homers (32.4 percent) came after age 35. The only batters other than Aaron to top 200 homers after 35 are Bonds and Rafael Palmeiro.

As amazing as that late kick is, one thing neither Perry, nor any of the other writers whose Aaron tributes I came across, mentioned is the influence his ballpark may have played on those totals. When examining the effect of parks on any player's career, one should bear in mind the sheer contrast between the comforts of home and the drudgery of travel, as well as the venue's specifications and the sample sizes which may affect a single season. Playing at home means getting to sleep in your own bed, and who among us doesn't prefer that to living out of a suitcase?

Nonetheless, the pattern for Aaron is rather convincing. The Braves moved from Milwaukee to Atlanta in 1966. According to Ballparks.com, Milwaukee County Stadium's fences at the time they left were (left to right) 320'-362'-402'-362'-315', ranging from 8'4" to 10' tall. Atlanta-Fulton County Stadium's fences were further back to begin with (325'-385'-402'-385'-325') but they stood only 6' tall. The park underwent some rejiggering in the team's first few years and stood at 330'-375'-400'-375'-330' by 1969. While those dimensions made the field larger than Milwaukee's, the Atlanta stadium's altitude of 1,000 feet above sea level placed it as the highest park in the majors until the Colorado Rockies came along, and its impact on homer totals gave it the nickname "The Launching Pad."

In his nine years in Atlanta, Aaron hit 192 homers at home versus 145 on the road. But besides the home runs, the park wasn't especially a hitter's park, at least until a few new NL ballparks came into play midway through that string. Here are Aaron's home-road breakdowns, as taken from the *Bill James Historical Abstract* (the 1987 version), along with the Batters' Park Factors from Baseball-Reference.com. Remember that the BPFs are for runs and not homers, an important distinction which Perry recently discussed in the context of Dodger Stadium. I've split Aaron's Atlanta period into two eras, one in which his park played as essentially neutral on scoring and the other when it became a hitter's park; the average Park Factors for those eras are weighted by Aaron's plate appearances:

Year	PF	HHR	RHR	PA	PA/HR	Notes
1966	102	21	23	688	15.6	fences 325-385-402-385-325
1967	99	23	16	669	17.2	
1968	100	17	12	676	23.3	
1969	100	23	23	639	13.9	fences 330-375-400-375-330; add Jarry (MON), Murphy (SD)
<b>TOT</b>	<b>100.3</b>	<b>84</b>	<b>74</b>	<b>2672</b>	<b>16.9</b>	

Year	PF	HHR	RHR	PA	PA/HR	Notes
1970	106	23	15	598	15.7	add Three Rivers (Pit), Riverfront (Cin)
1971	106	31	16	573	12.2	add Veterans (Phi)
1972	109	19	15	544	16.0	
1973	108	24	16	465	11.6	fences 330-375-402-375-330
1974	104	11	9	382	19.1	fences 330-385-402-385-330
<b>TOT</b>	<b>106.7</b>	<b>108</b>	<b>71</b>	<b>2562</b>	<b>14.3</b>	

Aaron's increased homer frequency did coincide with the 1969 change in dimensions; he went from one every 18.2 PA in his first three years in Atlanta to one every 14.2 afterwards. Judging from the BPFs, the stadium's impact on runs was due more to the retirement of Crosley Field (an extreme hitter's park) in favor of Riverfront (a pitcher's park), and the addition of pitcher-friendly Jack Murphy Stadium, the expansion San Diego Padres' park, than to the changed dimensions. A quick scan of various park factors around the league confirms this. Throwing out 1970 because

both new stadiums were added mid-season, we see the following Batter Park Factors among the stadiums listed above (weighted to account for the two expansion franchises' late entry):

Years	PIT	CIN	PHI	MON	SD	AVG	ATL
1966-69	99.5	107.8	99.5	100.0	96.0	101.6	<b>100.3</b>
1971-74	97.8	96.5	102.5	103.0	93.5	98.7	<b>106.8</b>

So Aaron's stadium favored offense. How much did it aid homers? Retrosheet's team splits for the era go back only to 1969, but the data quite clearly shows the "Launching Pad" tag was deserved. From 1969-1974, the Braves and their opponents hit 1.35 homers in Atlanta for every one on the road:

Year	AFCS	Road	Notes
1969	161	124	
1970	206	134	
1971	186	119	
1972	154	125	
1973	205	145	Aaron, Evans & Johnson top 40 HR
1974	109	108	league HR rate dropped 21%

<b>TOT</b>	<b>1021</b>	<b>755</b>
AVG	170	126

Aaron's rate for that interval was 1.39 home HR for every road HR, slightly above the Braves and their opponents. But among the great home run hitters, how big a deal is all of this? Using the aforementioned *Historical Abstract*, Retrosheet, and BigLeaguers.com, I compiled the home-road breakdowns of the top 20 home run hitters of all time. Asterisks denote active players, totals are through April 20, and yes, Barry has caused me to update this a few times.

Rank	Player	HR	HHR	RHR
1	Hank Aaron	755	385	370
2	Babe Ruth	714	347	367
<b>3</b>	<b>Barry Bonds*</b>	<b>667</b>	<b>327</b>	<b>340</b>
4	Willie Mays	660	335	325
5	Frank Robinson	586	321	265
6	Mark McGwire	583	285	298
7	Harmon Killebrew	573	291	282
8	Reggie Jackson	563	280	283
9	Mike Schmidt	548	265	283
<b>10</b>	<b>Sammy Sosa*</b>	<b>543</b>	<b>292</b>	<b>251</b>
11	Mickey Mantle	536	266	270
12	Jimmie Foxx	534	299	235
<b>13</b>	<b>Rafael Palmeiro*</b>	<b>529</b>	<b>288</b>	<b>241</b>
t14	Willie McCovey	521	264	257
t14	Ted Williams	521	248	273
t16	Ernie Banks	512	290	222
t16	Eddie Mathews	512	237	275
18	Mel Ott	511	323	188
19	Eddie Murray	504	248	256
20	Lou Gehrig	493	251	242

As a whole, these men were aided slightly by their parks, hitting 51.4 percent of their homers at home, an average advantage of 16 homers (292 to 276). Aaron's decisive Atlanta advantage is mostly mitigated by his Milwaukee years, and while he ranks towards the top in his ratio of home HR to road HR, he's still below the group average:

Player	H/R Ratio
Ott	1.718
Banks	1.306
Foxx	1.272
Robinson	1.211
<b>Palmeiro*</b>	<b>1.195</b>
<b>Sosa*</b>	<b>1.163</b>
Aaron	1.041
Gehrig	1.037
Killebrew	1.032
Mays	1.031
McCovey	1.027
Jackson	0.989
Mantle	0.985
Murray	0.969
<b>Bonds*</b>	<b>0.962</b>
McGwire	0.956
Ruth	0.946
Schmidt	0.936
Williams	0.908
Mathews	0.862
<b>AVG</b>	<b>1.058</b>

Mel Ott took advantage of the Polo Grounds' short foul lines to an almost absurd extreme, while Ernie Banks, Jimmie Foxx, and Frank Robinson also benefited greatly from their home parks. Interestingly enough, lefty-hitting Eddie Mathews, a teammate of Aaron's from 1954-1966, was hurt the most of any of these players; he played only one season in Atlanta and so didn't gain the late-career advantage that Aaron did. One of the bigger surprises on this list was Babe Ruth's home/road breakdown: Despite the "House That Ruth Built" tag applied to Yankee Stadium, he actually had more homers on the road than at home. Here's a quick breakdown of the Bambino's career by phase:

Years	Park	HHR	RHR
1914-19	Fenway	11	38
1920-22	Polo	75	73
1923-34	Yankee	259	252
1935	Braves	2	4
<b>TOT</b>		<b>347</b>	<b>367</b>

At the outset, I would have wagered that the extreme split in Fenway had more to do with his career on the mound, with the Sox pitching their sensation at home whenever possible to boost attendance and letting him play outfield on the road. But the data to be gleaned from Retrosheet (which doesn't have splits for that era) doesn't support this. Ruth played the outfield for the Sox only in 1918 and 1919, a time during which his homer split, according to James, was nine in Fenway and 31 on the road. At that point his pitching career was on the wane; he made only 34 starts in those two years, compared to 79 in the previous two. Of those 34 starts, only 19 came at Fenway, a minimal advantage. It's more likely that Fenway's righty-favoring dimensions (initially 321'-388'-488'-550' (deepest right center)-402'-314', according to *Take Me Out to the Ballpark*) really did have an impact on his totals.

In any event, the home/road splits of the top home run hitters make for interesting data. One quick-and-dirty way of looking at this, or rather two ways, is to double the home totals and the road totals to get numbers approaching their true totals, then comparing them to the current list (whose numbers many of us substitute for sheep in our insomnia-addled hours). The former gives us a number which the hitter might have achieved had he enjoyed all of the advantages of home, while the latter gives us an idea of how he would have fared in more neutral surroundings. Leaving their overall rankings alongside their names to emphasize the shifts, we get:

Rank	Player	2x HHR	Rank	Player	2x RHR
1	Aaron	770	1	Aaron	740
2	Ruth	694	2	Ruth	734
4	Mays	670	3	<b>Bonds*</b>	<b>680</b>
3	<b>Bonds*</b>	<b>654</b>	4	Mays	650
18	Ott	646	6	McGw ire	596
5	Robinson	642	8	Jackson	566
12	Foxx	598	9	Schmidt	566
10	<b>Sosa*</b>	<b>584</b>	7	Killebrew	564
7	Killebrew	582	t16	Mathew s	550
t16	Banks	580	t14	Williams	546
13	<b>Palmeiro*</b>	<b>576</b>	11	Mantle	540
6	McGw ire	570	5	Robinson	530
8	Jackson	560	t14	McCovey	514
11	Mantle	532	19	Murray	512
9	Schmidt	530	10	<b>Sosa*</b>	<b>502</b>
t14	McCovey	528	20	Gehrig	484
20	Gehrig	502	13	<b>Palmeiro*</b>	<b>482</b>
t14	Williams	496	12	Foxx	470
19	Murray	496	t16	Banks	444
t16	Mathew s	474	18	Ott	376

The "home-doubled" list makes for a few dramatic changes. Aaron's advantage on Ruth is increased, but more notably, Ott zooms into the top five from the lower reaches of the chart, Frank Robinson crosses the 600 threshold, and Jimmie Foxx reclaims the top-10 status he held a quarter-century ago. Two Chicago Cubs, Sammy Sosa and Ernie Banks, move up considerably in their totals, but then so does the majority of this list. In all, three members of the true top 10 fall out of that elite. The "road doubled" list is much more similar to the actual one in the rankings. Aaron holds only a bare six-homer advantage on Ruth, and Bonds vaults way past his godfather Mays. Only two of the true top 10 fall out, and the jockeying at the top of the list is very minor, with Mathews and Ted Williams both joining its lower reaches. At the bottom of the list, the changes are more dramatic; four members of the 500 HR club fall below that mark with their road-doubled totals, with Ott undercutting 400.

The take-home message of all of this is that while Hank Aaron's homer totals, particularly his late-career surge, were helped by his home park, in the context of the game's top home run hitters, the effect was not all that pronounced. For many of the hitters, switching teams or moving into new ballparks tended to balance out their favorable and unfavorable conditions. Taking advantage of one's playing environment isn't a crime, and before we dish out an asterisk for Aaron's tremendous achievement, we ought to consider also that he racked up a good amount of his homer totals in the pitcher-friendly 1960s. Baseball history is full of such fluctuations, and while it's important to consider a player's accomplishments in the context of the terrain, that shouldn't diminish our admiration for Aaron's feat.

That goes for Bonds as well. One fact that's been lost in his homer surge of the past few years is that the Giants' new stadium, SBC Park (formerly Pac Bell) is a terrible home run environment for EBB (Everybody But Barry). Comparing Bonds' home and road HR totals to those of the Giants and their opponents in games at SBC/Pac Bell and elsewhere:

Year	BBH	BBR	SF	RD
2000	25	24	171	206
2001	37	36	146	234
2002	19	27	114	200
2003	23	22	143	173
<b>TOT</b>	<b>104</b>	<b>109</b>	<b>574</b>	<b>813</b>

In the park's first four years, Bonds hit 0.954 homers at home for every one on the road. Think about that—as amazing as his feats have been, *his numbers may still be limited by his home park*. The Giants and their opponents have suffered even more, hitting only 0.706 homers there for every homer elsewhere. Some might point to darker explanations for Barry's ability to overcome his park, but his achievements deserve some appreciation as well. If he eventually passes Aaron for the top spot, it won't be because of his environment, it will be in spite of it.