

Home Run Hitting

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I have been looking at home run hitting with a data set I obtained from source. This is a preliminary table I made up of the home run hitters from 1959 through 2004. I have focused on some statistics that make hitting independent of number of games played. In the following three tables I list the stats I think are highly relevant to seeing if home run hitting has changed and who the best producers are. In a follow on, I will show some interesting results on the statistical distribution of home runs and show that it is one that is found in many areas where extreme accomplishment is recorded.

The following tables present the following variables: player name (nameLast), year, HR (home runs in that year), hrhit (home runs per hit), hrab (home runs per at bat), hrops (home runs per hitting opportunity, adding base on balls to at bats to obtain total hitting opportunities), ahrhit (the average for the league in each year of home runs per hit), arhrops (the average for the league in each year of home runs per opportunity).

I chose home runs per hit to get a sense of whether or not current hitters hit with more power than earlier hitters. Home runs per hit strikes me as a good measure of this; if hitters are more powerful, then of the hits they do get, more of them should be home runs. I want to note that technique has improved markedly over the years. Now, most players have well-schooled and soundly technical swing mechanics and that is a factor in generating power. So, whatever you read into the stats regarding power, technique, or steroids you must keep those factors in mind.

For now, I just present the stats without looking for patterns or doing much analysis; they are so interesting in and of themselves. I do notice that in his record year of 1961, Roger Maris achieved an outstanding .3836 ratio of home runs to hits. Dave Kingman had consistently high home runs per hit, always more than .33 and as high as .387. Overall, he was not a consistently high home run hitter because he did not have a high enough hitting average. But, his home runs may have even helped his average because a home run cannot be an out.

The stellar performer is Mark McGwire from the very beginning of his career in 1987, nearly a third of his hits were home runs. He went on to improve from that high rate to .448 in 1995, to an astounding .52 in 2001, when he hit only 29 home runs. In his record-setting year of 1998 (is it that long ago? it seems like yesterday) he hit 70 home runs. That year, 46 percent of his hits were home runs. This is a level Barry Bonds matched in his record

year of 2001 when he hit 73 home runs. These two guys are the elite of home run hitters; no one else even comes close in the number of home runs they produce per hit. Even the great Sammy Sosa hit a home run every third hit at his prime. McGwire did this almost from day one of his career. Bonds reached the .333 home runs per hit only by 1999 and kept it there since, exceeding it in his record 2001 year. Hitting for a higher average than McGwire and playing a bit longer have helped his total production. But, it seems Mark McGwire is the premiere home run hitter. He only got better over the years and you could see it in his technique which evolved over time. He went from a forearm rolling, leaned back hitter to a short swing, long extension hitter. He took the top hand off the bat after contact and swung on a more extended arc without the forearm roll. He was the most consistent power hitter during this era and maybe of all time.

After this table, I include one graph which I will explain later.

. list nameLast year HR hrhit hrab hrops ahrhit ahrops if hrhit >=.3 & AB>200

	nameLast	year	HR	hrhit	hrab	hrops	ahrhit	ahrops
16.	Killebrew	1959	42	.3181818	.0769231	.1891892	.1039933	.053602
1275.	Maris	1961	61	.3836478	.1033898	.2411067	.1089125	.052195
1282.	Mantle	1961	54	.3312883	.1050584	.1868512	.1089125	.052195
1283.	Gentile	1961	46	.3129252	.0946502	.1893004	.1089125	.052195
1977.	Killebrew	1962	48	.358209	.0869565	.2	.1052207	.0517048
1985.	Cash	1962	39	.3170732	.0769231	.1718062	.1052207	.0517048
2737.	Killebrew	1963	45	.3383459	.0873786	.2195122	.0999889	.0512209
2740.	Blanchard	1963	16	.3265306	.0733945	.2133333	.0999889	.0512209
3487.	Mincher	1964	23	.3382353	.0801394	.2421053	.0998229	.0443913
3491.	Powell	1964	39	.3170732	.0919811	.1959799	.0998229	.0443913
3492.	Killebrew	1964	49	.3141026	.084922	.1967871	.0998229	.0443913
4988.	Shamsky	1966	21	.3888889	.0897436	.244186	.1008196	.0444082
7270.	Killebrew	1969	49	.3202614	.0882883	.1644295	.0957306	.0416102
7271.	Jackson	1969	47	.3112583	.0856102	.1773585	.0957306	.0416102
9126.	Stargell	1971	48	.3178808	.0939335	.2051282	.0879651	.0443477
10891.	Kingman	1973	24	.3870968	.0786885	.2330097	.0912085	.0486325
10893.	Aaron	1973	40	.3389831	.1020408	.2150538	.0912085	.0486325
12693.	Kingman	1975	36	.3103448	.0717131	.24	.079674	.0374318
13601.	Kingman	1976	37	.3274336	.0780591	.2624114	.0665218	.0379555
16432.	Thomas	1979	45	.3308823	.0807899	.1923077	.0905542	.0460862
16433.	Schmidt	1979	45	.3284672	.0831793	.1750973	.0905542	.0460862
16434.	Kingman	1979	48	.3137255	.0902256	.2424242	.0905542	.0460862
17392.	Schmidt	1980	48	.3057325	.0875912	.1951219	.0809302	.0447307
19287.	Kingman	1982	37	.3394496	.0691589	.2202381	.0897453	.0488876
21282.	Phelps	1984	24	.3428572	.0827586	.1832061	.0871566	.0478828

Table 1: Home Run Hitting stats from 1959 to 1984.

21286.	Kittle	1984	32	.32	.0686695	.2147651	.0871566	.0478828
22275.	Evans	1985	40	.32	.0792079	.1904762	.097939	.0523506
22276.	Thomas	1985	32	.3076923	.0661157	.1702128	.097939	.0523506
22277.	Roenicke	1985	15	.3061225	.0666667	.1612903	.097939	.0523506
23275.	Deer	1986	33	.3055556	.0708155	.1833333	.1033894	.0596036

24293.	Phelps	1987	27	.3139535	.0813253	.1626506	.1176408	.0640103
24294.	McGwire	1987	49	.3043478	.0879713	.2112069	.1176408	.0640103
24295.	Balboni	1987	24	.3	.0621762	.2105263	.1176408	.0640103
25340.	Kittle	1988	18	.3103448	.08	.2432432	.0877387	.0511085
26370.	Williams	1989	18	.3050847	.0616438	.2465753	.0849475	.0479487

27443.	Balboni	1990	17	.3333333	.0639098	.1976744	.0900943	.0555937
27447.	Maas	1990	21	.328125	.0826772	.1962617	.0900943	.0555937
27448.	Fielder	1990	51	.3207547	.0890052	.2048193	.0900943	.0555937
27449.	McGwire	1990	39	.3170732	.0745698	.167382	.0900943	.0555937
28558.	Deer	1991	25	.3125	.0558036	.147929	.0925379	.0466539

28559.	Horn	1991	23	.3108108	.0725552	.2	.0925379	.0466539
28561.	Palmer	1991	15	.3	.0559702	.1829268	.0925379	.0466539
29640.	McGwire	1992	42	.336	.0899358	.1953488	.0831327	.0448453
29643.	Deer	1992	32	.3298969	.0814249	.2162162	.0831327	.0448453
30715.	Plantier	1993	34	.3063063	.0735931	.1976744	.0980822	.053594

31889.	Williams	1994	43	.3613445	.0966292	.2828947	.1111522	.0609747
31896.	Sheffield	1994	27	.3033708	.0838509	.1928571	.1111522	.0609747
31897.	Bonds	1994	37	.3032787	.0946292	.1887755	.1111522	.0609747
32922.	McGwire	1995	39	.4482759	.1230284	.2228571	.1103719	.0628387
32927.	Sorrento	1995	25	.3289474	.0773994	.1968504	.1103719	.0628387

32928.	Buhner	1995	40	.3252032	.0851064	.2185792	.1103719	.0628387
32929.	Tettleton	1995	32	.3137255	.0745921	.15311	.1103719	.0628387
34174.	McGwire	1996	52	.3939394	.1229314	.2096774	.1172495	.061443
35440.	McGwire	1997	34	.3269231	.0928962	.2098765	.1118854	.0616604
35443.	Buhner	1997	40	.3053435	.0740741	.16	.1118854	.0616604

Table 2: Home Run Hitting stats from 1984 to 1997.

35444.	Griffey Jr.	1997	56	.3027027	.0921053	.2145594	.1118854	.0616604
36666.	McGwire	1998	70	.4605263	.1375246	.2229299	.1138259	.0645168
36677.	Canseco	1998	46	.3333333	.0789022	.226601	.1138259	.0645168
36679.	Sosa	1998	66	.3333333	.1026439	.2435424	.1138259	.0645168
36680.	Strawberry	1998	24	.3287671	.0813559	.2016807	.1138259	.0645168

36681.	Vaughn	1998	50	.3205128	.08726	.212766	.1138259	.0645168
36682.	Griffey Jr.	1998	56	.3111111	.0884676	.21875	.1138259	.0645168
37982.	McGwire	1999	65	.4482759	.1247601	.2338129	.1219582	.0655257
37985.	Bonds	1999	34	.3655914	.0957747	.2048193	.1219582	.0655257
37987.	Sosa	1999	63	.35	.1008	.244186	.1219582	.0655257

37989.	Vaughn	1999	45	.3333333	.0818182	.2045455	.1219582	.0655257
37997.	Hundley	1999	24	.3076923	.0638298	.1967213	.1219582	.0655257
39290.	McGwire	2000	32	.4444444	.1355932	.2162162	.1258233	.0674959
39297.	Bonds	2000	49	.3333333	.1020833	.1856061	.1258233	.0674959
39305.	Justice	2000	21	.3181818	.0843373	.2019231	.1258233	.0674959

40656.	McGwire	2001	29	.5178571	.09699	.2589286	.1243875	.0640221
40663.	Bonds	2001	73	.4679487	.1533614	.2192192	.1243875	.0640221
40672.	Sosa	2001	64	.3386243	.1109185	.2098361	.1243875	.0640221
40681.	Thome	2001	49	.3202614	.0931559	.1856061	.1243875	.0640221
42001.	Thome	2002	52	.3561644	.1083333	.1940299	.1169116	.0593954

42012.	Bonds	2002	46	.3087248	.1141439	.1325648	.1169116	.0593954
42013.	Sosa	2002	49	.30625	.0881295	.1863118	.1169116	.0593954
42015.	Rodriguez	2002	57	.3048128	.0913462	.2080292	.1169116	.0593954
42016.	Branyan	2002	16	.3018868	.0737327	.183908	.1169116	.0593954
43321.	Bonds	2003	45	.3383459	.1153846	.1601423	.1181878	.0619597

43332.	Dunn	2003	27	.3292683	.0708661	.1730769	.1181878	.0619597
43334.	Edmonds	2003	39	.3170732	.0872483	.195	.1181878	.0619597
43336.	Giambi	2003	41	.3059702	.0766355	.1558935	.1181878	.0619597
43337.	Thome	2003	47	.3051948	.0813149	.1773585	.1181878	.0619597
44672.	Glaus	2004	18	.3461539	.0869565	.2168675	.1224338	.0688845

44679.	Bonds	2004	45	.3333333	.1206434	.1226158	.1224338	.0688845
44683.	Valentin	2004	30	.3092783	.0666667	.2142857	.1224338	.0688845
44685.	Dunn	2004	46	.3046358	.0809859	.1776062	.1224338	.0688845
44686.	Thome	2004	42	.3021583	.0826772	.1728395	.1224338	.0688845

Table 3: Home Run Hitting stats from 1997 to 2004.

Now the question becomes what is the source of the slight change in total home runs hit in the major leagues over time? I think the answer is the presence of a few premiere home run hitters close to McGwire, Bonds and Sosa in power hitting. But, I leave deeper exploration of that issue for a later note.

Right now I am interested in the following questions: has home run production increased at all levels of hitting in the big leagues? Or is it a few premiere hitters? Here are some things to think about.

I graphed home run hitting in percentiles over the time period of 1959 to 2004. I calculated home runs per hit in the 20th, the 50th, the 70th, the 90th and for the most home runs hit in a year. Only the maximum shows a peak during the McGwire and Bonds great years. Otherwise, there is no trend toward a higher number of home runs per hit over this long time period.

Here is the graph:

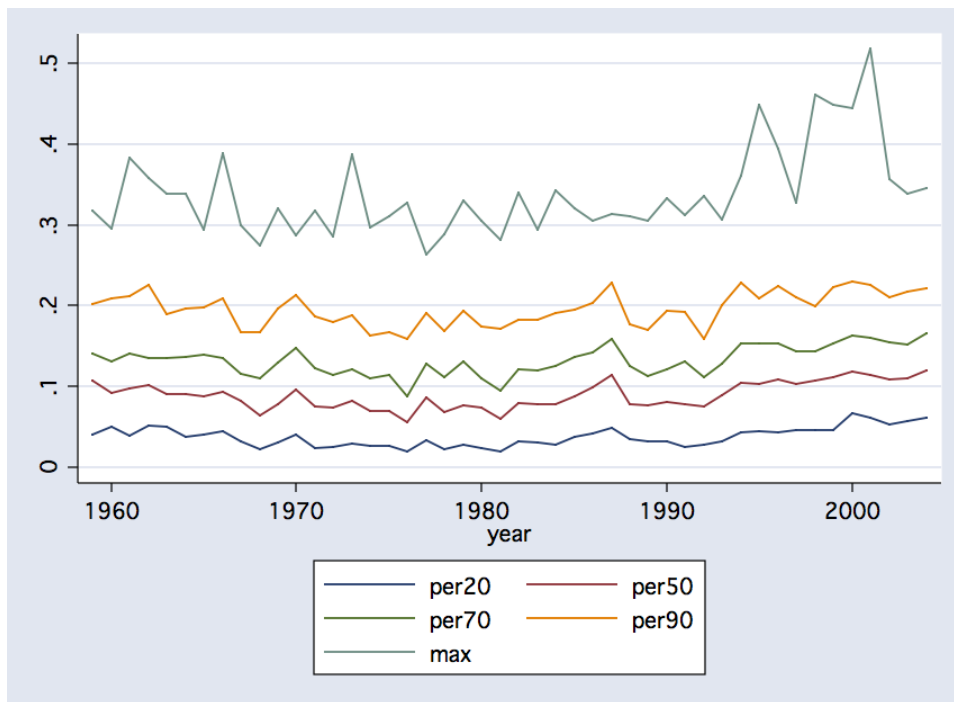


Figure 1: Home Run Hitting in Percentiles and Maximum

Quite an eye full I think. Even the 90th percentile hitters did not exceed slightly more than .20 home runs per hit, nowhere near the levels attained by a few, unique power hitters. Home run hitting is an area of human accomplishment that is dominated by a handful of brilliant hitters. Even the 90th percentile hitter looks like an underachiever compared to these guys. That turns out to be true in science, the arts, scholarship and many areas of

human accomplishment. More later on that topic.

If steroids were responsible for increased home run production, where is the evidence in the 20th through 90th percentiles? There is none.