Watering Down Coors:
The Rockies' Ball Humidor

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At 5,280 feet above sea level, Denver is the highest city with a Major League Baseball franchise. Coors Field, the home ballpark for the National League's Colorado Rockies, is, because of the very high altitude, a hitter-friendly park. In 2002, the Rockies (with permission from Major League Baseball) installed a humidor, that is, a humidity- and temperature-controlled room to store their baseballs. Humidifying baseballs by placing them in a humidor adds moisture to the balls and thus makes them heavier and harder to hit. While installation of the humidor would make the baseball more like what visiting teams hit at lower altitudes, the change might be expected to have the biggest (and not necessarily a favorable) effect on the home team Colorado Rockies. In this note, we compare the number of home runs hit at Coors Field one season before and after the installation of the humidor.

Table 1 summarizes the results for the home team Rockies and all visiting teams, not all of which were the same in both 2001 (before the humidor) and 2002 (after the humidor).[1] The average number of home runs hit by the Rockies in their 81 home games each season fell dramatically from 1.53 to 1.20 ($p = .037$ for a 2-sample, one-tailed test). For their opponents, the average number of home runs also fell, from 1.78 to 1.67, but here the difference between means was not statistically significant ($p = .315$ for a 2-sample, one-tailed t-test). In 2001 (before the humidor), visiting teams averaged more home runs per game than the Rockies at Coors Field, but this difference (between "1.53" and "1.78" in Table 1) was not significant ($p = .245$ for a 2-sample, two-tailed t-test). In 2002 (after the humidor), visiting teams averaged significantly more home runs per game than the Rockies ($p = .025$ for a 2-sample two-tailed test on the difference between "1.20" and "1.67" in Table 1).[2] Two American League (AL) teams − the Anaheim Angels and the Seattle Mariners − that visited Coors Field in 2001 for interleague play did not

visit the following year. Three other AL teams − the Cleveland Indians, the New York Yankees, and the Tampa Bay Devil Rays − that did not visit in 2001 played in Denver in 2002. Table 2 shows that for three of the four visiting teams that played at least nine games at Coors Field each season, average home runs per game fell in 2002 (after the humidor) relative to 2001 (before the humidor), although no difference was statistically discernible at the .05 level. For only the San Francisco Giants did the average number rise and that was due in large part to a single 18-5 blowout on July 2, 2002, when three Giant sluggers combined for seven home runs.

Concluding Remarks

In February of 2007, the commissioner's office announced that *every* team in Major League Baseball should use a humidor to store baseballs before the game at a uniform temperature (70 degrees) and humidity (50 percent). The Colorado Rockies' unilateral decision to use a humidor five years earlier in 2002 did not create an advantage for the home team. In fact, as shown here, Rockies' fans witnessed fewer home runs per game and considerably fewer from the home team.

**Table 1. Average Number of Home Runs per Game
At Coors Field, 2001 and 2002**

	Before Humidor (2001)	After Humidor (2002)	p-value on difference[*]
Colorado Rockies	1.53	1.20	.037
Opponents	1.78	1.67	.315
Total	3.31	2.87	.063

[*]2-sample, 1-tailed t-test on H$_0$: $\mu_{Before} = \mu_{After}$ versus H$_A$: $\mu_{Before} > \mu_{After}$.

**Table 2. Home Runs Hit by Visiting Teams at Coors Field,
2001 and 2002**

Team	2001 (Before humidor)		2002 (After humidor)	
	Avg. per game	Games	Avg. per game	Games
Anaheim Angels	3.67	3	*	*
Arizona Diamondbacks	1.40	10	1.22	9
Atlanta Braves	2.00	3	1.00	3
Chicago Cubs	0.33	3	3.67	3
Cincinnati Reds	0.67	3	2.00	3
Cleveland Indians	*	*	0.67	3
Florida Marlins	1.33	3	0.50	4
Houston Astros	1.33	3	1.67	3
Los Angeles Dodgers	2.11	9	1.40	10
Milwaukee Brewers	2.00	3	2.33	3
Montreal Expos	3.00	3	3.00	3
New York Mets	1.00	4	2.00	3
New York Yankees	*	*	3.00	3
Philadelphia Phillies	1.67	3	0.00	3
Pittsburgh Pirates	2.00	3	0.00	3
San Diego Padres	1.40	10	1.11	9
Seattle Mariners	2.67	3	*	*
San Francisco Giants	2.22	9	2.50	10
St. Louis Cardinals	1.83	6	3.67	3
Tampa Bay Devil Rays	*	*	1.33	3

Footnotes

1.   All data are from http://www.baseball-reference.com/teams/COL/ , the team page

for the Colorado Rockies. For each of the two seasons, click on "Gamelogs:Bat"

for game-by-game statistics for the home team Rockies and click on "Gamelogs:Pitch"

for game-by-game statistics for the visiting teams.

2.   Visiting team averages were helped in no small part by the New York Yankees who

hit nine home runs and scored a total of 41 runs on their first trip to Coors Field in

2002. Excluding the three games with the Yankees, the opponents' home run per

game average falls from 1.67 to 1.60 in 2002, but the difference between "1.60" and the

Rockies' "1.20" is still statistically significant ($p = .049$).