Test results for preliminary study
PFOS on hands of soccer players and coaches on artificial turf vs grass

Three players and one coach used GhostWipes® to wipe their hands prior to and after soccer games on artificial turf and on natural grass fields in California in the summer of 2023. The same individuals played three games on artificial turf and three games on natural grass on six different days; wipes were pooled for each individual on each substrate. Yellow highlighted results indicate an increase in PFOS.

Individual	Grass (ng/wipe)		Artificial turf (ng/wipe)	
	Pre-game	Post-game	Pre-game	Post-game
Individual #1	0.90 PFOS	ND	1.1 PFOS	2.4 PFOS
Individual #2	1.1 PFOS	0.46 PFOS	0.80 PFOS	0.65 PFOS
Individual #3	0.95 PFOS	0.54 PFOS	0.94 PFOS	1.9 PFOS
Individual #4	ND	0.40 PFOS	0.54 PFOS	0.88 PFOS

Note: MDL = 0.40 ng/wipe

Data were tested for normality using a Shapiro-Wilk normality test; data appear normal (p=0.8). We then examined the difference of PFOS levels of three young female athletes playing soccer and an adult male coach, looking at the change in PFOS levels (ng/wipe) (i.e., PFOS levels after playing on artificial turf minus PFOS levels before playing on artificial turf).

PFOS is found in roughly three-quarters of all artificial turf tested.[1]

Our hypothesis was that there would be an increase in PFOS levels on the hands of players/coach es from playing on artificial turf, but not grass. We tested this hypothesis by using a one sample t-test to examine the change in PFOS levels before and after the games.

1 https://curate.nd.edu/articles/thesis/Development_of_Analytical_Methods_for_Highly_Selective_and_Sensitive_Analysis_of_Compounds_Relevant_to_Human_Health_and_the_Environment/24869502

Results suggest an increase in PFOS levels from playing on artificial turf with a mean increase of PFOS (mean=0.6125 ng/wipe, $p<0.08$).[2] These data were not statistically significant, but a study with a greater N (10 to 30 athletes) should be performed to get an accurate measure of exposure and estimate the risk of PFOS dermal exposure.

A t-test run on the change in PFOS before and after playing on grass resulted in a $p= 0.92$, indicating there is no significant difference between PFOS on hands before and after games played on grass. However, it is interesting to note that three of the players lost PFOS after playing on grass.

[2] Statistical significance is indicated with a p=.05 or less; p=0.08 is approaching significance