CALIFORNIA STATE SCIENCE FAIR
2013 PROJECT SUMMARY

Name(s)

Christopher J. Caterinicchio

Project Number

J1504

Project Title

Turf Wars: A Microbial Battleground; The Study of Microbial Growth on a Synthetic Turf & a Natural Grass Football Field

Abstract

Objectives/Goals

My project was to determine if the composition of a football field's surface has an effect on the amount of microbial growth. I believe that a synthetic, artificial turf football field will have more microbial growth than a natural grass field.

Methods/Materials

Six football players volunteered to run a predetermined churn pattern on either a 100-yard artificial turf field or 100-yard natural grass field. Three athletes were randomly assigned to the grass field and three athletes were assigned to the artificial field. Each player's right cleat was identically cleaned and disinfected immediately prior to coming into contact with the field surface being studied. After running the churn pattern, each player's right cleat was removed by me prior to leaving the surface under investigation. Samples were collected from the soles of each cleat and streaked onto a Petri dish. A total of six Petri dishes were inoculated; three from the grass field and three from the artificial field. A third group of uncontaminated sterile Petri dishes served as the control. All dishes were stored and allowed to grow in an undisturbed, warm location away from direct heat or sunlight. The number of colony forming units (CFUs), color, size and appearance of CFUs on each Petri dish was measured and recorded at zero, 24, 48 and 72 hours.

Results

The amount of microbial growth in samples from the artificial turf football field was greater than the amount of microbial growth from the natural grass field samples.

Conclusions/Discussion

Based on the evidence collected, more CFUs were found on the Petri dishes from the artificial turf field. My data showed that based on averages, the natural grass agar plates had between 25%-48% less CFUs overall than the artificial turf plates which supports my original hypothesis.

There was significant germ growth over 72 hours on both natural grass and artificial turf Petri dishes. These findings may help local athletes reduce their chances of getting a skin infection or other illness by practicing good hygiene.

Summary Statement

An artificial turf field has more microbial growth than a natural grass field.

Help Received

Mother helped get Petri dishes and provided supervision for collecting samples and handling Petri dishesVarsity Coach E.Terry allowed access to football players, dad helped assemble display board.