

Connor Sendel

*Optimization of Materials for Catcher's Gear Chest Protectors*

This experiment was to determine the best material for a catcher's chest protector based on weight, safety, and the distance the ball deflects. This was tested using pouches of the same volume for the materials tested, these being catcher's gear padding, density foam, styrofoam beads, paper, down feathers, and a metal lath. Weight was measured in ounces, safety was measured using Shockwatch labels which signify g-force, and distance measured in inches. A composite score was calculated by adding twice the weight, the average bounce distance, and a score of five point increments from 0 to 30 ranking safest to least safe material. Down feathers had the best overall score most likely because they are light weight, yet are dense enough to be safe. The down feathers were followed closely by styrofoam beads. These were followed by density foam, catcher's gear, metal lath and finally paper. styrofoam minimized weight, paper minimized bounce distance, and down was the safest. Based on the factors of weight, deflection, and safety, down feathers should be the material catcher's gear is made of to minimize weight and bounce distance and to maximize safety.